



كليات التقنية العليا  
HIGHER COLLEGES OF TECHNOLOGY

HCT  
2.0

# APPENDIX

# Course Descriptions

## ACC 1103 Managerial Accounting (3-1-3)

Use accounting information for internal reporting and decision making. Provides in-depth knowledge in cost accounting by focusing on its role in internal reporting and the resulting decision making processes which contribute to analytical skills. The major topics of managerial accounting include profit planning and control measures, comparison of the effects of absorption and variable costing on net income and preparation of master budgets.

Prerequisite: ACC 1003

## ACC 2003 - Cost Accounting (3-1-3)

Introduces core concepts of cost accounting to inform managerial decision making. Provide in depth knowledge of cost accounting information, application of job costing in a business organization, issues related to process costing, an understanding of activity based costing and joint cost allocation in organizations.

## ACC 2103 - Intermediate Financial Accounting I (3-1-3)

Provides in-depth knowledge of accounting principles and procedures essential to the preparation of financial statements with particular emphasis on the corporate form. Topics covered include preparation of financial statements including cash flow statements, valuation of current assets, inventory valuation methods, and recording of transactions related to property, plant and equipment.

Prerequisite: ACC 1003

## ACC 3003 - Intermediate Financial Accounting II (3-1-3)

Provides in-depth knowledge on applications of accounting for investments that companies make in stock and debt securities of other companies, including accounting for the different forms of partnership, timing and criteria for revenue recognition, as well as accounting treatment of retired shares and buyback. It also covers preparation of shareholders' equity section of balance sheet, as a foundation for a more detailed study of financial statements.

Prerequisite: ACC 2103

## ACC 3013 - Taxation (3-1-3)

Provides an overview of individual taxable income and tax liability, taxable and exempt benefits, property income, pension, assessable trading income, partnership and limited liability partnership, chargeable gains for individuals, tax administration for individuals, inheritance tax, corporation tax and Value Added Tax.

## ACC 3113 - Auditing (3-1-3)

Provides an understanding of accounting and financial audits. Analyzes different audit areas, including professional standards and ethical responsibilities of auditors, audit risk and materiality, risk assessments for internal control, internal control for cash receipts and disbursement cycle. In addition it covers audit evidence and reporting on audited financial statements, using real life examples.

Prerequisite: ACC 2103

## ACC 4003 - Accounting Information Systems (3-1-3)

Introduces the concepts, components and functions of an Accounting Information System (AIS). Provides an understanding of the fundamental attributes of accounting information systems, business processes, the related internal controls and associated risks. It also deals with ethical issues and the risks of fraud in accounting information systems, revenue collection and expenditure processes.

Prerequisite: BIS 3003

## ACC 4013 - International Financial Reporting Standards (3-1-3)

Introduces the structure and requirements of International Financial Reporting Standards (IFRS) in a current financial reporting environment. Provides an understanding of IFRS and the IFRS framework, presentation of financial statements, inventories, statement of cash flows, accounting policies, construction contracts and property. It deals also with plant and equipment, leases, revenue recognition, accounting for government grants, borrowing costs, effects of changes in foreign exchange rates, financial Instruments and earnings per share issues.

Prerequisites: ACC 2103 and ACC 3003

## ACC 4023 - Advanced Management Accounting (3-1-3)

Develops analytical skills for managerial decision making. Introduces concepts of advanced managerial accounting to assist managers in planning, organizing and control functions. Provides in-depth knowledge of flexible budgets, variances based on standard costs, performance of responsibility centres, role of non-financial performance measures and differential analysis in managerial decision making.

Prerequisite: ACC 2003

## ACC 4033 - Accounting for Decision Making and Control (3-1-3)

Provides an understanding of product management, pricing, costs drivers and cost control for decision making and control. Identifies the role of opportunity costs in capital budgeting decision. Introduces accounting and non-accounting measures of performance in an organizational architecture, cost allocation issues and techniques and role of management accounting in a changing environment.

Prerequisite: ACC 2003

## ACC 4043 - Advanced Auditing (3-1-3)

Provides an in-depth understanding of the regulatory environment, professional standards, audit processes, advanced auditing techniques and contemporary issues in auditing. It reviews the auditors role in ensuring that publically issued financial statements are fairly presented. Audit procedures for financial transaction cycles as well as testing techniques for analytical reviews are discussed. It also deals with statistical sampling and tests of controls while planning, performing and evaluating samples for substantive procedures.

Prerequisite: ACC 3113

## ACC 4053 - Advanced Financial Accounting (3-1-3)

Provides knowledge of lease accounting, and the different forms of leases that can be used in an organization. It deals with analysis of accounting changes and errors, application of appropriate steps to adjust financial statements, including issues dealing with income statement content, presentation and disclosure. It also covers the preparation of consolidated financial statements for business combinations using equity, initial value and partial equity methods.

Prerequisites: ACC 2103 and ACC 3003

## ACC 4113 - Investment Analysis (3-1-3)

Introduce financial theories, models and market information necessary for dynamic investment opportunities, problems and controversies. Provides in depth understanding of portfolio and capital market theory, analysis, valuation and management of common stock, different techniques of security analysis, types of derivative securities, management of different investments, Islamic Finance and Islamic banking and its products.

Prerequisite: FIN 3003

**ACC 4123 - Cost Management (3-1-3)**

Provides knowledge and understanding of the role of cost management in strategic planning and decision making. Applies benefit, cost and variance analysis to evaluate an organizations' strategic plans and deals with issues related to implementing activity based costing systems and activity based management. Also covers managing customer profitability according to customer type, cost estimation, application of financial and cost volume profit models, including the use of decision trees in cost management and decision making.

Prerequisite: ACC 2003

**ACC 4133 - Accounting Systems Performance Management (3-1-3)**

Performance management entails the performance analysis of business organizations through selected variances and management by exceptions. Identifies the relevant accounting information for special order pricing, outsourcing, allocating constrained resources and keeping or eliminating operations. Topics covered also include performance evaluation in decentralized organizations and construction and interpretation of financial statements including cash flow statements.

Prerequisite: ACC 4023

**ACC 4143 - Management Control Issues (3-1-3)**

Study the mode of operation in management accounting and control systems. Identifies salient issues and assesses the impact of change, information technology, accountability, governance and ethics on management accounting and control systems. Provides an understanding of the essentials of project management which includes major tasks in project initiation, planning, and the various stages in project implementation.

Prerequisite: ACC 4033

**ACC 4153 - Financial Reporting (3-1-3)**

Provides knowledge of advanced methods used in the analysis of financial statements, as well as extensible business reporting language, business valuations, leases and off balance sheet debts. In addition it covers, the accounting treatment of selected items in financial statements which includes accounting for bonds, provisions and contingencies, pensions, income tax, goodwill, marketable securities and investments and accounting for merger and acquisitions.

Prerequisite: ACC 4013

**ACC 4163 - Government and Non- Profit Accounting (3-1-3)**

Provides understanding of various aspects of accounting and financial reporting of government and not for profit organizations. It looks at the role of fund balances, public sector accounting standards, accounting treatment of revenue and expenditure in governmental funds. It also covers government wide statements, accounting for special purpose entities such as hospitals, colleges and universities, as well as other not-for-profit entities.

Prerequisite: ACC 2103

**ACC 4173 - Contemporary Issues in Accounting (3-1-3)**

Contemporary Issues in accounting focuses on modern concepts and emerging trends in accounting. It reflects on the issues that are being considered in professional practice such as approaches to measurement, fair value accounting, the conceptual framework for financial reporting, corporate governance, environmental accounting and sustainability, earnings management, as well as the financial indicators of corporate collapse and principles of Islamic Accounting.

Prerequisite: ACC 4053

**ACC 4203 - Accounting Research Project (3-1-3)**

Final semester integrative project has a standardized framework within which research projects of various majors can be accommodated to meet all program learning outcomes. The final project gives opportunities for the application and critical review of theory synthesizing the knowledge obtained from several specialization courses.

**ADF 3003 - Air Defence Systems (2-2-3)**

The organisation, equipment and concept of operations of ground and air based Air Defence assets and formations of the UAE and Allied Forces. Systems considered include ground and maritime weapons systems, communications systems, and aircraft.

Prerequisites: AHM 1203, AVS 2153 and ADF 3103

**ADF 3013 - Air Defence Tactics (2-2-3)**

The main principles of Air Defence Tactics involving the early warning units, strategic air defence units, airborne air defence and command and control of air defence units. The course covers the integration of ground based and airborne early warning units, ground based weapons and communication systems. The employment of strategic air defence units are discussed and the integration of air defence units attached to Land Forces.

Prerequisites: ADF 3103 and AVS 3153

**ADF 3103 - Air and Space Power (2-2-3)**

Air Forces Organization and Weapons, Types and Methods of Air Attack, Air Superiority and Counter Air Operations, Strategic Attack, Close Air Support, Air Interdiction, Air Mobility, Intelligence Surveillance and Reconnaissance, Air Operations Management, C2 Principles, Air Space Control, Electronic Warfare, Discussions, Airbase Visit and Air Operations Centre Visit.

**ADF 4003 - Tactical Communications Systems (2-2-3)**

Students examine the unique communications requirements of military forces. Communications Organisation (Communication Force), and Communication Systems and Regulations are studied to prepare the student to communicate securely and successfully using the appropriate methods for each communication requirement. Tactical radio and wireless communication systems and their technical specifications are covered.

Prerequisite: AVS 1013

**ADF 4013 - Land Forces Organisation and Weapons (2-2-3)**

The organisation, structures, equipment and capabilities of individual Land Force formations and organisations are examined in the context of the military effect they would be expected to achieve. Students then determine how individual formations and organisation are assembled together to provide a larger capability for detachment or deployment.

**ADF 4112 - Airspace Management (1-2-2)**

Explains how civilian and military air-space is managed through structures and regulations for safety and security. Students will learn Rules of the Air, General Airspace Division and Classification, UAE ATC Organization, UAE Military Airspace, Aeronautical Documentation, Civil Control Techniques, Fighters in a Training Zone, Separation Norms, Picture Building Airspace, UAE AOC Divisions, Air Tasking Orders, Airspace Co-ordination, COMPLAN and SPINS, AP Mission Brief.

Prerequisite: AVS 3103 or AVS 3193

**ADF 4123 - Fighter Control (2-2-3)**

Fighter Control capability is discussed, from the history of the first use of Fighter Controllers to the modern capability. Fighter Control organisations and functions are reviewed, to include Control and Reporting Centres, Airborne Early Warning, and C4ISR. Personnel roles within Fighter Control organisations are also reviewed.

Prerequisite: ADF 3103 and AVS 2153

**ADF 4134 - Aircraft Recognition (3-1-4)**

Aims at providing students with the skills of recognition of different national, regional and international aircraft. The course includes technical and tactical aircraft recognition points, the importance of Aircraft Recognition, How to update and find new Aircraft types, Practical Exercise - Aircraft fact finding, recognitions of Fighter aircraft, Bombers, Reconnaissance aircraft, Training aircraft, Transport aircraft, Helicopters, Unmanned aerial vehicles (UAV) and Missiles, and Area Countries Aircraft.

**ADF 4207 - Ground Based Air Defence Systems Operation (3-4-7)**

Students deploy and practice the use of ground based air defence assets. Equipment specifications, modes of operation and tactics for use are discussed and students will carry out live or simulated operation of the equipment against a simulated threat.

**AES 1003 - Emirati Studies (3-1-3)**

Fostering citizenship through introducing the students to the major social aspects of UAE society values and heritage, offer studies in variety of important fields related to UAE history, geography, internal and external political aspects, social development and services provided by UAE, woman empowerment, UAE approach to knowledge based community, multiculturalism, developments in infrastructure, economy and technology and UAE position in the global competitiveness. Presents future visions for development strategical plans and its challenges.

**AES 1013 - Arabic Communications I (3-1-3)**

Enhancing proficiency and skills in the Arabic language by developing solid knowledge and competencies in both productive (speaking/writing) and receptive skills (reading/ listening) are fundamental for graduates. The course adopts an integrated approach with an emphasis on current professional use of Arabic by engaging with standard, modern, and integrated topics to enhance knowledge and communication skills.

**AES 2003 - Arabic for Non-Native Speakers (3-1-3)**

This is a course aimed at developing Arabic language skills for non Arabic speakers (reading, writing, speaking and listening), grammar, and vocabulary. The students will learn and practice the basic communication skills that will get them engaged with their culture, study, and work requirement.

**AES 2023 - Arabic for non-Native Speakers II (3-1-3)**

The teaching and learning process in this course is based on communication, meaning that the functional use of language would be a priority as well as the communication in context. The students' responsibility throughout the semester would be to prepare basic texts, including reading of grammatical notes, vocabulary memorization, and spelling. The teaching and learning process would be provided in the Standard Arabic only.

Prerequisite: AES 2003

**AES 3003 - Professional Arabic (3-1-3)**

Enhancing professional Arabic skills for the workplace, focusing on the needs of management professionals in a cross-cultural environment, while improving communication skills effectively in both oral and written media as applied in workplace related situations.

Prerequisites: AES 1013.

**AET 2103 - Fundamentals of Flight (3-1-3)**

Covers the basic aspects of atmospheric flight, the aerodynamic characteristics of airplanes and the engine performance, as well as how the geometric shape of the airplane influences these properties. Focuses on the analysis of steady and accelerated flights.

Prerequisites: PHY 1103 and MTH 1203

**AET 2403 - Applied Thermofluids (3-1-3)**

Presents the properties a pure substance, first and second laws of thermodynamics, analysis applied to different systems and control volumes, thermodynamics applications. Covers fluids and their properties, conservation equations and their applications. Prerequisites: PHY 1103 and MTH 1203

**AET 2902 - Sophomore Design Project (1-2-2)**

Sophomore project requires the formation of a team to propose a plan, design and prototype an open ended basic aeronautical engineering relevant project. The students' team is totally responsible for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation and prototyping schedule, and estimated cost.

Corequisite: AET 2103

**AET 3101 - Aeronautical Engineering Lab (0-3-1)**

Introduces experiments in aeronautics which include basic measurements of aerodynamic forces and pressure distribution using low speed wind tunnel, flight demonstration, jet and propeller engine operations, bending of aircraft wing, deflection of thin-walled beams, Non-Destructive Testing.

Prerequisites: AET 2103, 3303, AET 3413 and AET 3603

**AET 3303 - Aircraft Structures (3-1-3)**

Covers the principles of stressed skin structures, aircraft structural materials and components, airworthiness and airframe loads. Presents topics including bending, shear and torsion analyses of open and closed thin-walled beams, structural idealization, and stress analysis of aircraft components.

Prerequisites: MCE 2213 and MCE 2303

**AET 3413 - Applied Aerodynamics I (3-1-3)**

Introduces the basics of aerodynamics, the concept of lift and drag. Aerodynamic characteristics of airfoils: airfoil geometry parameters, vortex panel method, Kutta condition, thin-airfoil theory, high-lift airfoil section, Wings of finite span: lifting-line theory, trailing vortices and downwash, vortex-induced drag, vortex-lattice method, Effects of boundary layer interaction.

Prerequisite: PHY 1103

Corequisite: MTH 2503

**AET 3423 - Applied Aerodynamics II (3-1-3)**

Covers the principles of compressible flow, one-dimensional gas dynamics, normal and oblique shock waves. Prandtl-Meyer flow, Mach lines and characteristics. Includes analysis of two-dimensional, supersonic flows over wings and airplane configuration. Prerequisite: AET 3413

**AET 3503 - Fixed And Rotary Wing Assemblies (3-1-3)**

Presents a general view of the various fixed and rotary wing aircraft components, control systems, landing gear, fuel systems, wheels, brakes, and rotor systems.

Prerequisite: AET 2103

**AET 3513 - Aircraft Design (3-1-3)**

Conceptual design of an airplane based on a set of requirements. Size and weight estimation. Design analysis based on the performance parameters. Sizing of cockpit, passengers' cabin, cargo compartment. Weapon carriage considerations, Conic shape lofting of fuselage and wings for design layout, engine selection and integration.

Prerequisites: AET 2103 and AET 3303

**AET 3603 - Flight Vehicle Dynamics and Stability (3-1-3)**

Focuses on topics that include static stability and control, airplane equations of motion, analysis of aerodynamic forces and moments, analysis of longitudinal and lateral dynamic stability.

Prerequisites: AET 2103, MTH 2503 and MCE 2223

**AET 4123 - Aircraft Reliability and Maintenance Engineering (3-1-3)**

Presents an introduction to reliability theory, life testing, maintained systems, integrated logistic support (ILS), aircraft handling, repair station requirements, quality systems, inventory control, structural repair, engine maintenance and overhaul, maintenance of aircraft systems and instruments.

Prerequisites: AET 3303 and EGN 2806

**AET 4143 - Human Factors in Aviation (3-1-3)**

Develops understanding of the human behavior and performance when applied to aviation operations. Optimizes the fit between people and the aeronautical systems in which they work to improve safety and performance. Introduces a comprehensive overview of the effect and management of human factors in aviation.

Prerequisite: EGN 2806

**AET 4203 - Mechanics of Composite Structures and Materials (3-1-3)**

Introduces fiber reinforced composites and their properties. Examines the stress, strain, and strength of composite laminate. Presents topics such as failure analysis of composites, environmental effect on laminates, and design of composite structure.

Prerequisite: MCE 2213

**AET 4213 - Rotary Wing Aircraft (3-1-3)**

Presents the aerodynamics of flight for rotary wing aircrafts. Two-dimensional aerodynamic characteristics of airfoils and their application in helicopter design. Aerodynamics of finite rotary wings. Theory of helicopter hovering and vertical flight including autorotation. Aerodynamic behavior of the rotor and the helicopter in forward flight.

Prerequisites: AET 2103, AET 3423 and AET 3603

**AET 4313 - Manufacturing Processes (3-1-3)**

Introduces common manufacturing processes such as rolling, drawing, machining, and joining (welding, soldering, adhesive bonding, and mechanical fastening), sheet-metal forming processes, and fabrication of composite materials. Introduction to heat treatment and plasma coating.

Prerequisite: AET 3513

**AET 4323 - Non Destructive Testing (3-1-3)**

Develops understanding of the various Non Destructive Evaluation and Testing methods, theory and their industrial applications. Demonstrates the difference between non-destructive testing and mechanical testing methods, testing techniques for surface, liquid dye penetration method, thermography, eddy current testing, ultrasonic testing, acoustic emission and radiography testing methodologies.

Prerequisite: MCE 2213

**AET 4333 - Introduction to Aero Elasticity (3-1-3)**

Studies the interaction of aerodynamics and structural motion and covers the essential knowledge of structural vibrations and aero-elastic static and dynamic critical flight conditions such as divergence, flutter and aileron reversal. Presents topics including structural vibrations and divergence, flutter and energy methods emphasizing indeterminate structures.

Prerequisites: AET 3303 and AET 3413"

**AET 4433 - Aircraft Propulsion (3-1-3)**

Develops understanding and enhances capabilities to perform analysis on different aircraft propulsion systems. Topics include: turboprops, turbojets, turbofans, turbo shaft, ramjets, scramjets and rocket engines, beside intakes, compressors, fans, turbines and propelling nozzles.

Prerequisites: AET 2403 and AET 3423

**AET 4443 - Computational Fluid Dynamics (3-1-3)**

Introduces the fundamental concepts, techniques, methods, and algorithms used in Computational Fluid Dynamics (CFD). Focuses on developing and implementing numerical methods and related algorithms for numerical solution of flow and transport partial differential equations (PDE) models. The practical utility of the course will be demonstrated by the application of the theory to understand and perform flow simulations using a commercial CFD software.

Prerequisites: AET 2403 and EGN 2712

**AET 4453 - Space Propulsion (3-1-3)**

Presents an introduction to rocket propulsion systems, solid, liquid-bipropellant, and hybrid rocket engines. Fundamentals of orbital, and interplanetary flight. Cover topics that include structural constraints, propellant feed systems, turbo pumps, and combustion processes.

Prerequisites: AET 2103 and AET 4433

**AET 4503 - Finite Element Analysis (3-1-3)**

Addresses the practice and use of FEA in industry. Introduces finite element mathematical modeling of engineering problems. Presents the application of CAD software using FEM to a range of engineering problems.

Prerequisites: MCE 2311 and AET 3303

**AET 4613 - Avionics Systems (3-1-3)**

Introduces knowledge of aircraft instruments and sensors, aeronautical navigation systems, aircraft communication systems, automatic flight control systems and actuators.

Prerequisite: MTE 3603

**AET 4623- Automatic Control of Flight Vehicles (3-1-3)**

Focuses on introduction and analysis of automatic control systems for both atmospheric and space aerospace vehicles. Covers basic control theory and design concepts and relevant flight dynamics principles for designing flight control system. With extensive use of MATLAB and Simulink, the student has hands on experience in practical aspects of automatic control application of aerospace vehicles. Covers single-variable control and also linear optimal control, nonlinear orbit plane control, two-point boundary value problem solution for de-orbiting spacecraft.

Prerequisites: AET 3603 and MCE 4603"

**AET 4863 - Special Topics in Aeronautical Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses.

**AET 4893 - Directed Study (3-1-3)**

Provides an opportunity to investigate under faculty supervision beyond what is offered in existing courses.

**AET 4902 - Capstone Design Project I (1-3-2)**

Combines the knowledge, skills and competencies acquired in aeronautical engineering courses into design activity. Requires the formation of a team to propose, plan and design an engineering project relevant to aeronautical engineering. Ensures team responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. Includes evaluation of the team on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisites: AET 3513 and AET 3603

**AET 4912 - Capstone Design Project II (1-3-2)**

Consists of implementation, evaluation, and analysis of an aeronautical engineering design project carried forward from the previous semester. Though guided by faculty, the student team is primarily responsible for the completion of the project milestones and course objectives. Requires the integration and application of technological, organizational, communication, and interpersonal skills by the student team. Includes accurate analysis, implementation, documentation, and presentation skills for assessments.

Prerequisite: AET 4902

**AFT 4006 - Aeroplane Ground School Training (6-1-6)**

Ground school training is designed to prepare the student to operate the training aircraft for flight and includes technical and operating details of training aircraft systems and flight line and safety procedures.

Prerequisites: AVS 2133 and AVS 3113

**AFT 4015 - Aeroplane General Handling Ground School (4-2-5)**

Students are taught the specific details of airfield operating procedures, aircraft flight procedures and aircraft manoeuvre procedures for VFR conditions. All aspects of general handling are covered including take-off, landing, climbing, descending, turning, level flight, circuits, emergency recovery, and aerobatics.

Prerequisite: AFT 4006

**AFT 4025 - Aeroplane General Handling Flying (0-10-5)**

Students practice general handling flight, applying all information and skills provided by previous courses. Students carry out airfield operating procedures, aircraft flight procedures and aircraft manoeuvre procedures for VFR conditions. All flight profiles for general handling are covered including take-off, landing, climbing, descending, turning, level flight, circuits, emergency recovery, and aerobatics.

Prerequisite: AVS 2133

**AFT 4101 - Aeroplane Instrument Flying Ground School (1-1-1)**

Students are taught Instrument Flight Rules and instrument flight procedures for flight and navigation and will practice those procedures on a flight simulator.

Prerequisite: AFT 4006

**AFT 4112 - Aeroplane Instrument Flying (0-4-2)**

Explains how civilian and military air-space is managed through structures and regulations for safety and security. Students will learn Rules of the Air, General Airspace Division and Classification, UAE ATC Organization, UAE Military Airspace, Aeronautical Documentation, Civil Control Techniques, Fighters in a Training Zone, Separation Norms, Picture Building Airspace, UAE AOC Divisions, Air Tasking Orders, Airspace Co-ordination, COMPLAN and SPINS, AP Mission Brief. Prerequisite: AVS 2133 and AFT 4101

**AFT 4202 - Aeroplane Navigation Flying Phase (1-3-2)**

Students apply navigational procedures and techniques to fly an aircraft in accordance with a navigational plan, using navigation maps, charts and navigation radio aids. Students practice visual navigation and radio aid navigation and also practice navigation specific emergencies. Prerequisites: AVS 2133 and AFT 4006

**AFT 4212 - Aeroplane Formation Flying Phase (1-3-2)**

Students apply operational and safety procedures to fly an aircraft in close formation in accordance with a formation flight plan and local procedures for formation flight. Students also practice formation specific emergencies. Prerequisites: AVS 2133 and AFT 4006

**AFT 4221 - Aeroplane Night Flying Phase (0-2-1)**

Students apply operational and safety procedures to fly an aircraft at night in accordance with a night flight plan and local procedures for night flying. Students also practice night specific emergencies.

Prerequisites: AVS 2133 and AFT 4006

**AHM 1203 - Aviation Physics (3-1-3)**

The principles of physics support explanation on how an aircraft behaves in relation to using physics principles/laws. Physics laws affect all aircraft maintenance designs, and maintenance engineers use fundamental principles of physics relevant to aviation technology. Topics covered include: matter; statics; kinetics; dynamics; fluid dynamics; thermodynamics; optics; wave motion; and sound.

Prerequisite: FND M020

**AVS 1003 - Aviation IT Systems (2-2-3)**

Students will review and practice using military and aviation IT systems and applications employed by the UAE Defence Force. The students will be provided with information about the structure of IT systems and then given specific details of the protocols for use of UAE Defence Force systems. Students will then practice the use of all the systems.

**AVS 1013 - Aviation Electric and Magnetic Fundamentals (3-1-3)**

Provides education in the fundamental physics behind some of the key technologies found in aviation systems. The course primarily focuses on Electricity, Magnetism and the basic physics behind electrical systems. However, there is an additional small section on wave motion and thermodynamics.

Prerequisites: AHM 1203 and LSM 1103

**AVS 1023 - Aviation Calculus (3-1-3)**

Presents the basic calculus concepts required for the student of aviation. Topics include differentiation and integration of algebraic functions; applications to velocity, acceleration, area curve sketching and computation of extreme values.

Prerequisite: LSM 1103

**AVS 2113 - Meteorology I (2-2-3)**

This course is devoted to basic meteorological knowledge essential to understanding the effect of weather on flight. Student pilots study the structure of the atmosphere, temperature, pressure, wind, clouds, stability, air masses, fronts, thunderstorm, icing, turbulence, visibility and fog. The course also includes lab activities designed to reinforce the theoretical concepts

**AVS 2123 - Principles of Flight (2-2-3)**

A study of principles of flight fundamentals and theory at the technical level. This course includes history of flight, major aircraft components, basics of aerodynamics, aerodynamic lift, drag, stalling and high speed aerodynamics.

Prerequisites: AHM 1203 and LSM 1103

**AVS 2133 - Survival (2-2-3)**

Covers principles of survival in a hostile environment. All geography conditions are considered, with an emphasis on survival in UAE environments of desert and sea. The course details aviation survival equipment and cadets carry out wet dinghy drills.

**AVS 2143 - Aircraft Systems and Components (2-2-3)**

Details the construct and systems of aircraft, examining aircraft structures, hydraulic systems, pneumatic systems, ice protection systems, air conditioning and pressurization systems, oxygen systems, fire protection systems, landing gear and fly-by-wire control systems.

Prerequisites: AHM 1203 and LSM 1103

**AVS 2153 - Radar Systems (2-2-3)**

Designed to provide cadets with the basic concepts of the radar theory and the operating principles of the ground and airborne radar systems. The course provides students with information on classic and modern Radar technologies and calculations. The course then extends to discuss processing the signals provided by Radar to convert them into data and information, and then concludes by reviewing various types of Radar data displays.

Prerequisites: AHM 1203 and AVS 1013

**AVS 3003 - Avionics (3-1-3)**

Introduction to the basic concepts, terminology, and theory of electronics and communication systems. Details of ground based and airborne avionic electronic systems, their technologies and use. Systems covering include communications, radio navigation aids and satellite navigation aids, electrical power, radar, guidance and control systems

Prerequisites: AVS 1013 and LSM 1103

**AVS 3013 - Instruments (2-2-3)**

The instruments covered by this course are treated in general terms. This course deals with aircraft attitude and flight path instruments, aircraft systems' monitoring instruments and navigation and aircraft management instruments including glass cockpit and multi-function displays. The course also covers instruments for engine and other aircraft systems. Prerequisites: AHM 1203, AVS 1013 and LSM 1103"

**AVS 3023 - Aero Engines (2-2-3)**

Provides information on the construct and operation of aircraft propulsion systems. Areas of study include piston and gas turbine engines, fuel and engine systems, gearing systems, accessories and propellers and rotors. Detail is also provided of thrust augmentation and control systems including: thrust reversal, thrust vectoring and afterburner

Prerequisites: AHM 1203 and LSM 1103

**AVS 3033 - Navigation (2-2-3)**

Students are shown how to prepare a navigation plan and carry out navigation in the air using maps and charts. Details of physical, time and geographic factors effecting navigation planning are provided and students are taught which maps or charts to select. Students prepare a medium level navigation plan using navigation instruments.

Prerequisite: LSM 1103"

**AVS 3042 - Meteorology II (1-2-2)**

Provides instruction on meteorological effects that represent hazards to air operations and reporting data specifically relevant to aircrew. Students are taught to interpret and use meteorological reports, charts and forecasts to prepare and plan for flight operations.

Prerequisite: AVS 2113

**AVS 3053 - Electrical Systems (2-2-3)**

Introduction to the basic concepts, terminology, and theory of electricity, magnetism and electronics. Details of ground based and airborne avionic electronic systems, their technologies and use. Systems covering include communications, radio navigation aids and satellite navigation aids, electrical power, radar, guidance and control systems.

Prerequisites: AVS 1013 and LSM 1103

**AVS 3103 - Airmanship (2-2-3)**

Covers basic Aviation Terminology, important Rules and Procedures, knowledge about Airport and Air Traffic Control System. This study improves cadets' sense of safe flying or 'Airmanship'. The students also visit Air Traffic Control Tower, Runway, Airport Lights, Navigation Aids and training aircraft.

**AVS 3113 - Aviation Safety (2-2-3)**

Students are introduced to the requirements of safety at work for aviation and the concepts of a safety culture to reduce aviation risks and improve performance. Students are shown how to identify hazards to safety on aircraft and airfields and how to prepare safety briefings and safety reports. Students are shown how aircraft maintenance contributes towards safety.

Prerequisite: AVS 3103

**AVS 3123 - Advanced Navigation (2-2-3)**

The course provides the students with advanced navigation techniques that can be used for airways, low-level and tactical navigation. Students are taught various techniques for managing the flight path so as to meet the navigation plans.

Prerequisite: AVS 3033

**AVS 3133 - Aircraft Performance: Aeroplane (2-2-3)**

The focus of this course is on aerodynamic performance of aircraft powered by reciprocating, turboprop, or jet turbine engines. The course includes aircraft performance curves, straight and level performance, climbing performance, descending performance, turning, take-off and landing performance, spinning, stability and control, and weight and balance.

Prerequisites: AVS 2123 and AVS 2143

**AVS 3143 - Human Factors (2-2-3)**

Students will examine the concepts behind human factors and their effect on human performance. The course demonstrates the importance of human factors and discusses its effects on safety, effectiveness and improvement of the aviation industry. The concepts of situational awareness, decision making and the effects of workload, fatigue, stress and physical fitness on human performance are covered. Students are introduced to the concepts and practices of Crew Resource Management.

Prerequisite: AHM 1203

**AVS 3153 - Electronic Warfare Systems (2-2-3)**

Provides students with a general overview of the principles, concepts and general scope of Electronic Warfare. The types or categories of Electronic Warfare and details of systems used to carry out the categories are studied, to include Electronic Attack (Electronic Warfare Counter-measures) Electronic Protection Measures (Electronic Warfare Counter Counter-measures) and Electronic Warfare Support (Electronic Support Measures).

Prerequisites: AVS 1013 and AVS 3053

**AVS 3163 - Principles of Flight: Helicopter (2-2-3)**

The focus of this course is a study of principles of flight specific to a rotary wing aircraft (helicopter). It builds upon the general aerodynamic information supplied in Principles of Flight by providing information on the aerodynamics of the rotating wing, the blades of the wing, and the usual aerodynamics of rotary wing forward moving flight and rotary wing hovering flight

Prerequisite: AVS 2123

**AVS 3173 - Missile Systems (2-2-3)**

Provides students with details of how air and ground based Air Defence missiles are designed and used. The technical specifications of the equipment, the payload, armament, propulsion, guidance and control systems are reviewed. Students then determine which Missile assets to use to establish a defence against a given air defence threat.

Prerequisite: AHM 1203

**AVS 3193 - Aviation Law (3-1-3)**

This course provides the student with a thorough grounding in the international and national legal aspects of aviation, covering air law, international agreements and policies, air navigation services and aerodrome configuration and management.

**AVS 4003 - Aircraft Performance: Helicopter (2-2-3)**

The focus of this course is on aerodynamic performance of fixed wing and rotary aircraft, with the primary emphasis being on helicopter performance. The course includes aircraft performance curves, straight and level performance, climbing performance, descending performance, turning, take-off and landing performance, spinning, stability and control, and weight and balance.

Prerequisite: AVS 3163

**AVS 4012 - Aviation Physiology (2-1-2)**

Provides students with the effects of flying on pilot's body, precautions and remedies for the physiological and psychological problems experienced by pilots. Hypoxia, hyperventilation, spatial disorientation, vision, physiology of ejection, effects of drugs alcohol and carbon monoxide on flying are included. Motion and decompression sickness, fatigue and effects of acceleration, description of the first-aid and good nutrition are also treated.

Prerequisite: AVS 3143

**AVS 4126 - Project (0-6-6)**

Students will carry out a Research Project as a Capstone Project. They will propose a hypothesis on an aviation topic, news item or system and carry out research on the hypothesis. Students will deliver a presentation on the research and present a paper with details of their hypothesis and their conclusions drawn from their research.

Prerequisite: LSS 1123

**AVT 1003 - Aviation Mathematics and Physics (3-1-3)\***

Covers mathematical and physical concepts that are essential for engineers in the field of aircraft maintenance. Basics of the following topics are covered: arithmetic, algebra, geometry, matter, statics; kinetics; dynamics; fluid dynamics; thermodynamics; optics; wave motion and sound. Learn the essentials of math and physics needed for basic aircraft maintenance courses.

Prerequisite: MTH 1103

**AVT 2103 - DC Electrical Fundamentals (2-5-3)\***

Examine the construction and use of electrical components used in aircraft DC electrical circuits and systems. Construct, operate and test DC circuits using a range of instruments, in accordance with relevant circuit diagrams in aircraft maintenance manuals. Learn the essentials of DC electricity needed for further electrical courses.

Prerequisite: PHY 1203

**AVT 2113 - AC Electrical Fundamentals and Electrical Machines (2-5-3)\***

Analyze the behavior of electrical components in AC circuits. Examine the construction and use of electrical machines to move, control and provide power to aircraft systems. Construct, operate and test AC circuits using a range of tools and instruments, in accordance with relevant aircraft technical publications. Enhance understanding of various aircraft electrical systems for operation and maintenance.

Prerequisite: AVT 2103

**AVT 2203 - Workshop Practices and Safety (2-5-3)\***

Introduces aircraft and workshop safety according to aviation standards. Covers the required working practices and know the appropriate safe aviation operations. Special topics include precautions to take when working with electricity, gasses, especially oxygen, oils and chemicals. Discuss instruction and remedial actions to be taken in the event of a fire or accident. Essentials of workshop knowledge including engineering drawings, fits and clearances, tool control, workshop equipment operation, workshop standards are all taught.

**AVT 2213 - Aircraft Materials (2-5-3)\***

Explore aircraft material properties and how these influence basic aircraft structural design and repair techniques. Topics taught in this course include ferrous and nonferrous materials, composites and non-metallic materials as well as hardness, tensile and fatigue testing and corrosion. At the end of this course participants know material handling and understand the reason for selection of materials and their properties.

Prerequisite: PHY 1103

**AVT 2223 - Aircraft Hardware (2-4-3)\***

Explore the basic components, fasteners, rivets, locking devices, pipes, unions, bearings, transmissions and control cables and how these influence basic design and maintenance. Provide the rationale behind using special devices and tools. Learn about sheet metal and materials handling along with welding and brazing.

**AVT 2233 - Maintenance Procedures and Abnormal Events (2-6-3)\***

Covers maintenance procedures such as aircraft weight and balance, handling, jacking, storage, inspection, disassembly and repair techniques. Examine re-fueling, de-fueling, ground power requirements, safety procedures. Examine concepts on reliability theory and non-destructive testing because of abnormal events such as lightning strikes, heavy landings and flight turbulence. Realize the impacts of these abnormal events on maintenance, scheduling and operation.

Prerequisite: AVT 2203

**AVT 2243 - Electrical Wiring Standards and Practices (2-5-3)\***

Covers electrical wiring and interconnect system (EWIS)\* of a modern aircraft. Examine cables, loom construction and interconnect ability, connector types, pins, plugs sockets, as well as current and voltage ratings. Discover the operation, function and use of avionic test equipment, along with soldering and inspection techniques. Experiment codes and parameters for constituent parts.

Prerequisite: AVT 2103

**AVT 2253 - Workshop Practices and Safety for Avionics (2-5-3)\***

Learn aircraft and workshop safety according to aviation standards. Understand the required working practices and know the appropriate safe aviation operations. Special topics include precautions to take when working with electricity, gasses, especially oxygen, oils and chemicals. This class discusses instruction and remedial actions to be taken in the event of a fire or accident. Essentials of workshop knowledge including engineering drawings, fits and clearances, tool control, workshop equipment operation, workshop standards are all taught.

**AVT 2263 - Aircraft Materials for Avionics (3-4-3)\***

Explore aircraft material properties and how these influence basic aircraft structural design and repair techniques. Topics taught in this course include ferrous and nonferrous materials, composites and non-metallic materials as well as hardness, tensile and fatigue testing and corrosion. At the end of this course participants know material handling and understand the reason for selection of materials and their properties.

Corequisite: PHY 1103

**AVT 2273 - Aircraft Hardware for Avionics (3-4-3)\***

Develop an understanding of basic components, fasteners, rivets, locking devices, pipes, unions, bearings, transmissions and control cables and how these influence basic design and maintenance. Examine the rationale behind using special devices and tools. Learn about sheet metal and materials handling along with soldering.

**AVT 2283 - Maintenance Procedures and Abnormal Events for Avionics (2-5-3)\***

Explore maintenance procedures such as aircraft weight and balance, handling, jacking, storage, inspection, disassembly and repair techniques. Learn about re-fuel, de-fuel, ground power requirements, safety procedures. Examine concepts on reliability theory and non-destructive testing because of abnormal events such as lightning strikes, heavy landings and flight turbulence. Realize the impacts of these abnormal events on maintenance, scheduling and operation.

Prerequisite: AVT 2253

**AVT 2293 - Electrical Wiring Standards and Practices for Avionics (2-5-3)\***

Learn the electrical wiring and interconnect system (EWIS)\* of a modern aircraft. Examine cables, loom construction and interconnect ability, connector types, pins, plugs sockets, as well as current and voltage ratings. Discover the operation, function and use of avionic test equipment, along with soldering and inspection techniques. Experiment codes and parameters for constituent parts.

Prerequisite: AVT 2103

**AVT 2303 - Aircraft Fundamentals and Basic Aerodynamics (3-1-3)\***

Learn the aircraft anatomy and study the theory of objects moving through the air. Understand the physics of the atmosphere. Aerodynamics examine the aircraft, the relative wind, and support an understanding of aircraft systems involved in lift, thrust, drag and weight coupled with the theory of flight and flight stability. The science of flight forms a major study and research project based on the application and fundamentals of the equation of flight. This course underpins courses taught later in the systems subjects.

Prerequisites: PHY 1103 and MTH 1103

**AVT 2806 - Work Placement I for Aviation (0-40-6)\***

Engage in practical work experience in an environment that develops skills and knowledge. Experience the activities in aviation maintenance, design industry, related aviation industry such as supply and logistics, test and calibration. This initial work placement may be in other engineering fields. Document journal entries explaining placement objectives and critique of the participant attitude, behavior and accomplishment.

**AVT 2902 - Sophomore Design Project (1-2-2)\***

Explore the preliminary stages of the aircraft design based on a given set of requirements. Learn basics of systems development, component design, modification and design improvement. The formation of a team is required to propose, plan and perform a preliminary aircraft design while working under the mentorship of a faculty or industry engineer. The student team is evaluated on its ability to coordinate efforts to propose the aircraft design criteria, aircraft components, resources, implementation schedule, and estimated cost.

Prerequisites: AVT 2303 and AVT 2203

**AVT 3102 - Semiconductor Fundamentals (1-3-2)\***

Learn the fundamentals of semiconductors since all modern aircraft use electronics in various systems within the cockpit, engine and cabin environment. Gain a fundamental understanding of diodes, transistors, and printed circuit boards. Define, describe and analyze some aircraft electronic circuits and complete practical assignments using a range of tools, in accordance with relevant design parameters and test equipment.

Prerequisite: AVT 2113

**AVT 3103 - Electronic Fundamentals (2-4-3)\***

Introduces the basic principles of electronics in all aircraft systems within the cockpit, engine and aircraft cabin environment. Explores the fundamentals of electronic circuits including diodes, transistors, integrated circuits, printed circuit boards and servo mechanisms. Covers material electron configuration and electrical properties, analyses of aircraft electronic circuits and complete practical assignments using a range of tools and instruments in accordance with relevant design parameters and test procedures.

Prerequisite: AVT 2103

**AVT 3113 - Digital Techniques Electronic Instrument Systems (2-5-3)\***

Explore digital techniques and electronic instrument systems with reference to typical systems arrangement and aircraft cockpit layout. Learn essentials of electronic instrument systems, numbering systems, data conversion, data buses, logic circuits and basic computer structure. Discuss integration of circuits Electronic displays, software management and control. Practical activities include typical electronic-digital aircraft systems and the use of aircraft simulators to interrogate systems faults and functioning of cockpit systems.

Prerequisite: AVT 3103

**AVT 3123 - Integrated Circuits and Servomechanisms (1-6-3)\***

Learn the fundamentals of integrated circuits and servo mechanisms. Experience complete practical assignments using a range of tools, in accordance with relevant design parameters and test equipment. Define, describe and analyze aircraft electronic circuits and Servomechanisms.

Corequisite: AVT 3102

**AVT 3133 - Digital Techniques (1-5-3)\***

Explore digital techniques relevant to electronic fundamentals. Learn about electronic instrument systems, numbering systems, integration of circuits, electronic displays and software management and control. Practical activities include the use and application of digital devices.

Corequisite: AVT 3123

**AVT 3143 - Electronic Instrument Systems (2-5-3)\***

Examine electronic instrument systems, numbering systems, integration of circuits, displays and software management and control. Participants will carry out practical activities which include the use of aircraft simulators and systems to interrogate systems faults and functioning of cockpit systems.

Corequisite: AVT 3133

**AVT 3203 - Maintenance Practices Workshop (1-8-3)\***

Examine maintenance practices in a theoretical and practical manner that are essential for engineers and technicians in the field of aircraft maintenance. Learn safety precautions; workshop practices; tools; test equipment; fits and clearances; riveting; maintenance procedures; and material handling. Complete aircraft maintenance activities in mechanical-aircraft workshops using a range of tools, in accordance with relevant aircraft manuals.

Prerequisite: AVT 2203

**AVT 3403 - Human Factors (2-4-3)\***

Explore human factors principles that are essential for engineers in the field of aircraft maintenance. Cover many relevant topics including: human performance and limitations, social psychology, factors affecting performance; physical environment, communication, human error and hazards in the workplace.

Prerequisite: AVT 2806

**AVT 3413 - Aviation Legislation (2-5-3)\***

Describes aviation legislation that is essential for technicians and engineers in the field of aircraft maintenance. Provides an overview of the regulatory framework; certifying staff; approved maintenance organizations; commercial air transportation; aircraft certification; continuing airworthiness, and applicable national and international requirements. Learn the essentials of the regulatory body's relevant rules and guidelines.

Prerequisite: AVT 2203

**AVT 3503 - Aircraft Flight Control and Structures for Avionics (2-5-3)\***

Learn basic aircraft structures, the theory of flight, and the primary pitch, roll, and yaw functions. Examine high lift devices along with boundary layer controls and the operations of trim tabs, servo tabs, and mass balance devices. Learn about how aircraft structure is affected by stresses and strains induced by flight controls and fail safe criteria. Examine general protection and lighting strike mitigation.

Prerequisite: AVT 2303

**AVT 3513 - Aircraft Instrument and Lighting for Avionics (2-4-3)\***

Explore the fundamentals of instrumentation and glass cockpit concepts. Examine pitot static systems, altimeters, speed indicators, compasses, gyroscopic components and other control supporting systems. Learn the on-board maintenance and data monitoring systems along with state of the art interior, exterior and emergency lighting systems.

Prerequisite: AVT 3143

**AVT 3603 - Propulsion (2-5-3)\***

Learn engine fundamentals, engine performance and basic components, that are essential for gas turbine operation. Topics covered include: Inlet, compressors, combustion, turbines, engine parts, exhaust, and collective synchronization and operation. Discuss the parameters, limitations and performance. Cover related systems such as fuel, air, ignition and indications.

**AVT 3703 - Gas Turbine Engine I (3-1-3)\***

Covers engine fundamentals, engine performance, engine efficiencies and basic components that are essential for gas turbine operation. Examine engine Inlet, compressor, combustion, turbine, exhaust. Engine components and parts are also discussed including bearings, seals, valves and pipes. Cover engine supporting systems such as lubrication and fuel system.

Prerequisite: AVT 2303

**AVT 3712 - Gas Turbine Engine I Workshop (0-6-1)\***

Support participants to complete supervised exercises on maintenance of aircraft gas turbine engines using a range of tools, in accordance with relevant aircraft manuals. Examine in detail all requirements for engine maintenance according to aviation standards. Practice all learned relevant theory in a supervised controlled environment.

Corequisite: AVT 3703

**AVT 3723 - Gas Turbine Engine II (2-6-3)\***

Examine in detail turbo prop, turbo shaft, auxiliary power units (APU)\* and Power plant installation. Learn engine subsystems including: reduction gears, engine-propeller controls, over-speed devices and coupling systems. Discuss auxiliary power units (APU)\*: purpose, operation and subsystems. Gain knowledge of fire protection systems, engine storage procedures and engine preservation techniques.

Prerequisite: AVT 3703

**AVT 3733 - Propeller (2-4-3)\***

Introduces propellers and blade essentials: fundamentals, construction, operation, maintenance, storage and preservation. Examine parts installation, pitch control, synchronization, ice protection, components operation, and system integration. Complete exercises on propellers maintenance using a range of tools and various scenarios in accordance with relevant aircraft manuals.

Prerequisite: AVT 2303

**AVT 3806 - Work Placement II for Aviation (0-40-6)\***

Gain relevant engineering experience in an actual working environment to provide an opportunity to develop and apply professional work ethics and practices. Transfer of engineering skills learned at college to the workplace is a major feature of this course.

Prerequisite: AVT 2806

**AVT 4503 - Aircraft Flight Control and Structures (2-5-3)\***

Introduces aircraft structures, the theory of flight, aerodynamics and flight controls, basics of pitch, roll, yaw, high lift devices along with boundary layer controls and the operations of trim tabs, servo tabs and mass balance devices. Examines aircraft structure: construction, layout, integration and limitations. Covers the effect of stresses and strains induced by flight controls and fail safe criteria on aircraft structure. Examines also general protection and lighting strike mitigation.

Prerequisite: AVT 2303

**AVT 4513 - Aircraft Conditioning and Oxygen (2-4-3)\***

Covers the essentials of air-conditioning, and cabin pressurization systems components such as zone controllers, outflow valves and warning systems/devices, human requirement for oxygen storage and distribution at altitude, and sources of air supply including engine bleed and ground cart. Introduces conditioning, supply system, distribution system, pressurization system control and relevant safety and warning devices.

Prerequisite: AVT 2223

**AVT 4523 - Aircraft Electrical Power (3-4-3)\***

Introduces DC and AC aircraft electrical power including: batteries, generators, inverters, transformers and voltage regulators. Explores external ground power, distribution, regulation and circuit protection, which are integral to the safe operation of commercial aircraft. Gain a thorough analytical understanding of the various relevant fundamental concepts.

Prerequisites: AVT 2103 and AVT 2113

**AVT 4532 - Aircraft Systems Workshop (1-3-2)\***

Includes a range of aircraft practical activities designed in accordance with aviation Standards. Covers systems interdependency and the aircraft redundancy systems to guarantee the safe conduct maintenance activities. Introduces the selection and use of correct tools, ground support equipment and test equipment.

Prerequisite: AVT 3203

**AVT 4543 - Aircraft Avionics Systems for Mechanical (3-2-3)\***

Covers integrated modular avionics system, integration of these systems with the flight deck and maintenance systems, monitoring and control of the total aircraft cabin and environment from an internal and external perspective. Learn monitoring and management of various aircraft systems including: electrical load, fuel system, pressure systems, avionic communication. Provide an overview of Auto Flight, Communications and Navigation systems.

Prerequisite: AVT 3113

**AVT 4553 - Aircraft Fuel and Passenger Systems (2-4-3)\***

Covers the details of the fuel system layout, supply options and distribution, indications, cautions and warnings and de-fueling/ refueling. Examine Passenger services such as water and waste along with aircraft equipment and furnishings, cargo and cabin emergency equipment.

Prerequisite: AVT 2203

**AVT 4563 - Aircraft Protection Systems (2-4-3)\***

Introduces fire and smoke detection systems, warning systems and fire extinguishing systems. Learn about the various fire extinguishers including fixed and portable systems. Explores the various protection-system functional tests. Prerequisite: AVT 2203

**AVT 4573 - Aircraft Hydraulic and Landing Gear (3-4-3)\***

Study the basic system components, distribution, network and safety of hydraulic systems and apply these fundamentals to an undercarriage system during extension and retraction. Examine systems of the wheels, brakes, anti-skid, steering and various relevant components.

Prerequisite: AVT 2203

**AVT 4583 - Aircraft Instrument and Lighting (2-4-3)\***

Explore the fundamentals of instrumentation and glass cockpit concepts. Examine pitot static systems, altimeters, speed indicators, compasses, gyroscopic components and other control supporting systems. Learn the on-board maintenance and data monitoring systems along with state of the art interior, exterior and emergency lighting systems.

Prerequisite: AVT 3113

**AVT 4602 - Aircraft Conditioning and Oxygen for Avionics (1-3-2)\***

Learn the fundamentals of Air-conditioning, and cabin pressurization systems components such as zone controllers, outflow valves and warning systems/devices, which are closely coupled with the human requirement for oxygen storage and distribution at altitude. Discuss sources of air supply including engine bleed and ground cart. Understand air-conditioning system i.e. supply system, distribution system, pressurization system control and relevant safety and warning devices.

Prerequisite: AVT 2273

**AVT 4613 - Aircraft Radio and Navigation Systems (3-5-3)\***

Learn principles of various communication and navigation systems including: VHF, HF, emergency locator transmitters, recorders, landing systems, Doppler systems and flight director systems. Explore the relationship between frequency, radio transmission waves and propagation. Study flight management systems and modern global positioning via GPS principles. Cover the essential aspects of flight communication, navigation, management and safety related systems.

Prerequisite: AVT 2103

**AVT 4623 - Aircraft Electrical Power for Avionics (2-4-3)\***

Explore DC and AC aircraft electrical power including: batteries, generators and voltage regulators. Study ground power, distribution, regulation and circuit protection, which are integral to the safe operation of commercial aircraft. Gain a thorough analytical understanding of the various relevant fundamental concepts.

Prerequisites: AVT 2103 and AVT 2113

**AVT 4633 - Avionics Systems (2-5-3)\***

Analyze aircraft on board maintenance systems including Central maintenance computers, data loading, electronic library and printing. Study the integration of pneumatic pressurization and temperature control with cockpit avionics systems. Illustrate crew information systems such as air traffic communication, ground stations, on board electrical management and mechanical systems. Examine all cabin intercommunication and network systems including in-flight entertainment. Identify Passenger services and contrast these with cockpit information systems.

Prerequisite: AVT 3143

**AVT 4643 - Aircraft Fuel and Passenger Systems for Avionics (2-3-3)\***

Learn the identification of the system layout, supply options and distribution, Indications, cautions and warnings and de-fueling/ refueling. Also examine Passenger services such as water and waste along with aircraft equipment and furnishings, cargo and cabin emergency equipment.

Prerequisite: AVT 2253

**AVT 4653 - Aircraft Radar Systems (2-5-3)\***

Examine Radar and its associated principles of operation and precautions. Learn essentials of radars, radar system components, component locations and operation. Explain radar importance and safe operation.

Prerequisite: AVT 4613

**AVT 4663 - Aircraft Protection Systems for Avionics (2-4-3)\***

Explore fire and smoke detection systems, warning systems and fire extinguishing systems. Learn about the various fire extinguishers including fixed and portable systems. Learn about the various protection-systems and their functional tests. Prerequisite: AVT 2253

**AVT 4673 - Aircraft Hydraulic and Landing Gear for Avionics (3-4-3)\***

Explore the basic system components, distribution, network and safety of hydraulic systems and apply these fundamentals to an undercarriage system during extension and retraction. Explain systems of the wheels, brakes, anti-skid, steering and various relevant components.

Prerequisite: AVT 2253

**AVT 4683 - Aircraft Autoflight Systems (2-4-3)\***

Learn essentials of automatic flight control including working principles and terminology. Explain the concepts of feedback and inner-outer loops. Explore the interrelationship between the pilot inputs and the aircraft motion sensors feedback to control a flight path.

Prerequisite: AVT 3503

**AVT 4902 - Capstone Design Project I (1-2-2)\***

Requires the formation of a team to propose, plan and design an engineering project related to aviation. Though guided under the mentorship of faculty or industry engineer, the student team is primarily responsible for the completion of project milestones and course objectives. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisite: AVT 2902

**AVT 4911 - Capstone Design Project II (0-3-1)\***

Consists of the implementation, evaluation, and analysis of an engineering design project carried forward from the previous semester. Though guided by faculty, the student team is primarily responsible for the completion of the project milestones and course objectives. Requires the integration and application of technological, organizational, communication, and interpersonal skills by the student team. Accurate analysis, implementation, documentation, and presentation skills form the basis for assessment.

Prerequisite: AVT 4902

**BIS 3003 - Business Information Systems (3-1-3)**

Covers the application of technology based information systems in organizations, as tools for achieving operational efficiency and the creation of business value. It develops understanding of how information systems support development and management of products and services and the decision making process to achieve competitive advantage. The major parts of information systems and their interrelationships are evaluated to allow the effective utilization of the systems.

**BNA 2103 - Business Applications Development using JAVA (3-1-3)**

Introduces business application development and covers fundamentals of object-oriented program development using top-down design; structured programming; debugging, testing and implementation; and elementary data structures. The Java programming language is used as the software tool to learn about the fundamentals of object oriented programming for business applications.

Prerequisite: CIS 2103

**BNA 3003 - Systems Analysis (3-1-3)**

Traditional systems development life cycle (SDLC) and alternative methodologies are reviewed. Focus is on planning, specification of structured requirements, methods, techniques, and tools used to determine information requirements, and documentation. Systems design methods and implementation issues are also introduced.

Prerequisite: CIS 2103

**BNA 3103 - Principles of Business Analytics (3-1-3)**

Focuses on knowledge and value building for the organization using business intelligence and analytics. As an introductory course it covers a broad range of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help users make new analytical models outside traditional frameworks. Specifically, it covers, knowledge fundamentals and management, business performance management, new models generation as support for decisions and value creation, and others.

Prerequisite: BNA 2103

**BNA 3133 - Database Design and Implementation (3-1-3)**

Through case studies, readings, and hands-on experience this course facilitates an in-depth study of database design to underpin decision support systems and related knowledge-based technologies. Additional focus is on organizational decision-making and its data, information, and knowledge-based support systems.

Prerequisite: BNA 2103

**BNA 4023 - Big-Data and Advanced Data Mining (3-1-3)**

Develop an understanding of the quantitative techniques and tools to solve issues related to resource allocation, optimization, process management and decision analysis problems in organizations. Apply linear programming, simulation modelling, network modelling and decision analysis tools to complex quality management processes using specialized software.

Prerequisite: BNA 3133

**BNA 4033 - Data Visualisation Techniques and Tools (3-1-3)**

Covers advanced techniques for communicating complex business analytics information, as a key element of modern data engineering. Visual, perceptive and cognitive issues relating to the use of data visualization systems is discussed. Additionally, the influence of visualization channel and messaging properties such as entropy, information rate and channel capacity is investigated. Frameworks for optimal selection and structured design of visualization pipeline elements are treated, as well as the design aspects of visualization schemes for supporting high-end business analytics.

Prerequisite: BNA 3003

**BNA 4103 - Advanced Business Analytics (3-1-3)**

Provides in depth understanding of how to manage and analyze business data to gain competitive advantage. It includes case studies, projects, and real-world business problems with the opportunity to apply business analytics skills and to use business analytics software applications. It includes case studies, projects, and real-world business problems with the opportunity to apply business analytics skills and to use business analytics software applications.

Prerequisite: BNA 4023

**BNA 4113 - Applied Marketing Analytics and Reporting (3-1-3)**

Provides an in-depth understanding of contemporary business analytics tools and systems used to measure, analyze and report digital and non-digital marketing performance. Topics include a range of open-source and proprietary analytic tools used in social and digital marketing schemes. Additionally, strategic issues pertaining to the use of high-end analytics for assessing marketing campaign efficacy is examined, coupled with frameworks for structured deployment of marketing analytics solutions, and marketing performance reporting

Prerequisite: STS 2003

**BNA 4123 - Ethics and Security in Analytics (3-1-3)**

Provides an in-depth understanding of diverse topics related to Security, Privacy and Ethics in business analytics. The key tools and frameworks available to analysts to examine security infrastructure in a business analytics project and identify the potential ethical issues that may arise. It also includes a range of functions and measures the analyst needs to ensure the security and privacy of proprietary data and the measures necessary for de-identification and privacy safeguards. In addition, strategic issues and concerns pertaining to analytic solutions and data sources are examined

Prerequisite: CIS 2103

**BNA 4203 - Business Analytics Research Project (3-1-3)**

Demonstrating mastery of the program learning outcomes, this capstone final semester course requires the application of in-depth knowledge and research skills gained across the Business Analytics Program to be evidenced in the industry-based project and report. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment.

**BSO 2003 - Basic Airport Security I (3-1-3)**

Teaches the basics of operational border security skills and knowledge of airport security. The students will identify explosive devices and offensive weapons, manage access controls, discuss and assess critical components relating to emergency management, fire prevention, passenger and airport personnel safety. Students should understand the special role of the Airport Police in three types of functions: Personal Safety, Equipment Protection and Building integrity.

**BSO 2013 - Aviation Safety and Security (3-1-3)**

A broad survey of all issues in international aviation safety and security. Learners will be exposed to the fundamental concepts of the aviation Safety Management Systems (SMS), as defined by ICAO. Learners will practice performing techniques for the identification, quantification and management of hazards and risks. They will also gain broader and deeper knowledge of necessary measures for dealing with any risks or incidents in an exemplary manner to provide a safe and healthy aviation environment.

**BSO 2023 - UAE Aviation Law and International Treaties (3-1-3)**

This course focuses on explaining the UAE Civil Aviation Law 1996 and its general provisions in the field of aviation and air navigation, as well as explaining the law of the General Authority of Civil Aviation of the United Arab Emirates for the year 1996, with the establishment and its terms of reference in this regard. To which the United Arab Emirates has joined in this area and the implications of acceding to these treaties.

**BSO 2103 - Residence and Foreigners Affairs Procedures (3-1-3)**

Participants will apply the knowledge and skills necessary to allow entry and residence for foreigners to the United Arab Emirates, according to the Regulations of Federal Law No. (6) of 1973 for foreigners. Participants will apply proper implementation of arrests and deportation regulations. They will also identify, describe and analyse the passport system, including diplomatic and special passports.

**BSO 2113 - Quality Control (Airport Security Audit and Inspection) (3-1-3)**

Participants will learn principles of auditing procedures for conducting audits of security systems in airports. They will survey essential airport security audit requirements in this basic-level study and analyse the reviews of national security programs. Finally, they will gain the skills to conduct audits, inspections and quality control across multiple security segments.

**CDG 2303 - Introduction to Graphic Design (3-1-3)**

Explores the elements and principles of both two and three dimensional design to equip students with the concepts, skills and competencies to become versatile practitioners in a wide range of media and professions. Focusing on colour theory, colour systems and typography, the course describes composition, rendering and production techniques using sketching and industry-standard software methods.

**CDG 3003 - Graphics Studio (3-1-3)**

The focus of Studio Graphics is the praxis of methods and techniques garnered from across the design industry. The course provides a framework in which students can develop more critical application of ideas by effectively managing stages of the design process, from conceptual development to full digital production.

**CDG 3503 - Typography I (3-1-3)**

Introduces essential aspects of typography such as letter-forms and page structures. Develops an understanding of the historical background, technical and aesthetic issues, and communicative abilities of typography through exploration and application of various design scenarios. Explores type solution and applies basic typography concepts to given situations.

**CDG 4003 - New Trends in Graphic Design (3-1-3)**

Discuss new trends and disruptive technologies that have an impact on Graphic Design. Developing processes and techniques to evaluate new trends, acquiring new knowledge and skills required for the adaptation. Several case studies will be used based on current trends at the time when the course is offered.

**CDG 4013 - Graphic Design Thinking for Innovation (3-1-3)**

Addressing four fundamental designing thinking questions and several tools to help in understanding design thinking as a problem solving approach. Discussing case studies different organizations that used design thinking to uncover compelling solutions. Building mindsets and foundations essential for graphic designers. Learn about the Human-Centered Design methodology and understand their real-world applications with focus on Graphic Design. Work on several graphic design thinking challenges and develop a design solution for real life challenge.

**CDG 4023 - Design Illustration (3-1-3)**

Analyses the professional field of illustration to produce effective visual narratives. Applying a variety of media and formats, explores the functionality of illustration effectiveness for presentation and distribution. Developing a dialogue of drawing and illustration as part of the classroom experience to equip students with the concepts and skills to work effectively in creative industry.

Prerequisite: CDG 3003

**CDG 4033 - Studio Graphics (3-1-3)**

The focus of Studio Graphics is the praxis of methods and techniques garnered from across the design industry. The course provides a framework in which students can develop more critical application of ideas by effectively managing stages of the design process, from conceptual development to full digital production.

Prerequisite: CDG 2303

**CDG 4503 - Advanced Typography (3-1-3)**

Aims to develop students' understanding of typographic principles in the context of current practice. Students' ability to make aesthetic and technical choices will be honed through evaluation of procedural standards used by professionals. Experimenting with typographic convention will allow students to develop their own approach, as they explore relationships between technology, process, and the creative application of typography.

Prerequisite: CDG 3503

**CDG 4713 - Packaging Design (3-1-3)**

Addresses the theory behind, and the studio investigation of, three-dimensional structures as they relate to the area of packaging, exhibition, advertising and environmental design. Through experiment with different materials while addressing client briefs, ensures design rationale addresses the target market. Develops skills by creating a package design for industry use.

**CDG 4723 - Sustainable/Social Design (3-1-3)**

Explores how the designer's role in shaping the public narrative on sustainable /social issues, causes and other needs-based topics, is crucial in becoming an accomplished graphic designer. By analysing contemporary environmental, cultural and societal issues around the world that have an impact on daily lives, applies creative design processes that increase awareness, motivate, inspire or incite action from specific, or broad, audiences. Through critiques and feedback sessions, assess design effectiveness according to the requirements of the design brief.

**CDG 4806 - Final Project - Graphic Design (8-1-6)**

Integrates all the skills, competencies and knowledge students have learned in Graphic Design to accomplish a project of industry standard. Brings together professional, creative and critical approaches to conceptualise, research, plan, develop, execute and evaluate an original and independent project, which will be subjected to peer and industry review.

**CHE 2113 - Applied Chemistry (2-2-3)**

Covers quantitative and qualitative aspects of chemical principles, such as gas behavior, thermochemistry, chemical equilibrium, solutions, and electrochemistry. Includes laboratory experiments that reinforce theoretical principles.

Prerequisite: CHM 1103

**CHE 2123 - Analytical Chemistry (2-2-3)**

Introduces the chemical characterization of samples by both qualitative and quantitative methods. Covers key concepts of data handling and sampling techniques, pH/pOH equilibrium and stoichiometric calculations, titrimetric methods, spectroscopy and chromatography. Special emphasis is placed on performing industry relevant experiments on modern analytical instruments.

Prerequisite: CHM 1103

**CHE 2133 - Organic Chemistry (2-2-3)**

Covers the fundamental principles of organic chemistry including nomenclature, structure and properties of organic molecules, isomerism, reactions and mechanisms. Includes laboratory experiments that reinforce fundamental principles of organic chemistry including synthesis of simple organic compounds methods for the purification and identification of organic compounds.

Prerequisite: CHM 1103

**CHE 2202 - Chemical Engineering Principles I (2-1-2)**

Develops an understanding of, and the necessary skills in, techniques of basic calculations covering essential chemical engineering principles and their applications in industry.

Prerequisite: CHM 1103

**CHE 2213 - Chemical Engineering Principles II (3-1-3)**

Develops an understanding of fundamental chemical engineering principles and their applications. Material and energy balances calculation for non-reactive and chemically reactive systems used in industrial processes are performed.

Prerequisites: CHE 2202 and MTH 1203

**CHE 2253 - Materials and Corrosion (2-2-3)**

Introduces the corrosion behavior of metals and alloys, properties of metallic and non-metallic materials, corrosion types, and corrosion mechanisms. Includes laboratory experiments to reinforce theoretical concepts.

Prerequisites: CHM 1103 and PHY 1203

Corequisite: CHE 2113

**CHE 2413 - Oil and Gas Processing Technologies (2-2-3)**

Explains the basics of oil and gas industry, main products, related production processes, use of natural gas, upstream processing of natural gas, and reforming of the components into alkenes. Emphasis is on types of feedstocks, reactions and uses of end products. Performs laboratory experiments of oil and gas samples using standard analysis methods.

Prerequisites: CHM 1103 and CHE 2113

Corequisite: CHE 2133

**CHE 2422 - Petroleum Chemistry Testing (1-2-2)**

Provides an introduction to atmospheric and vacuum distillations. Performs laboratory experiments of crude oil sample analysis using standard methods. ASTM methods are used for the analysis of physical and chemical properties of petroleum and gas products.

Prerequisites: CHM 1103 and CHE 2113

Corequisite: CHE 2133

**CHE 2453 - Fluid Mechanics (2-2-3)**

Applies fluid mechanics principles of energy balance, determination of flow regimes, compressible flow, and fluid measurement mechanisms to solve real life problems. Demonstrates metering and pumping of fluids and relevant application to the chemical and petrochemical industries.

Prerequisite: PHY 1103

**CHE 2903 - Sophomore Design Project (2-3-3)**

Requires the formation of a team to propose, plan and design an open-ended process design project. The student team is totally responsible for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the process design criteria, components, resources, implementation schedule, and estimated cost. Also covers health, safety and environmental aspects related to process plants.

Prerequisite: CHE 2202

Corequisite: CHE 2213

**CHE 3313 - Chemical Engineering Thermodynamics (2-2-3)**

Describes thermodynamic properties of pure substances, properties and the equations-of-state of ideal and real gases to solve thermodynamic problems. Discusses the laws of thermodynamics and chemical thermodynamic principles. Presents a typical thermodynamic cycle on a T-S diagram and calculates the performance of a steam power plant. Includes laboratory experiments to reinforce theoretical concepts.

Prerequisites: CHE 2213 and PHY 1103

**CHE 3323 - Mass Transfer (2-2-3)**

Covers the mass transfer operations with the fundamental theories related to industrial applications. Emphasis is made on mass transfer basic operations and laws, equilibrium stage operations, diffusion, gas absorption in packed towers and distillation. Laboratory exercises are performed to illustrate the theory and concepts.

Prerequisite: CHE 3313

**CHE 3403 - Chemical Heat Transfer (2-2-3)**

Covers heat transfer, one of the core subjects in chemical engineering. The principles of heat transfer in solids (heat conduction), forced and natural convection, and radiation are thoroughly covered. Emphasis is placed on problems solving techniques related to heat flow and heat exchangers design. A description of evaporators, furnaces, and boilers, is also included. A series of experiments are designed to reinforce the principles and develop skills for operating heat transfer equipment.

Prerequisites: CHE 2213 and CHE 2453

**CHE 3413 - Unit Operation 1 (2-2-3)**

Covers the fundamentals of separation processes used in chemical industries, such as filtration, evaporation, drying, liquid - liquid extraction and multi-component distillation. The concept of fluidization, size reduction processes and flow through packed beds are also discussed. Laboratory experiments are performed to reinforce theoretical concepts.

Prerequisites: CHE 3403 and CHE 3313

Corequisite: CHE 3323

**CHE 3513 - Equipment and Plant Design (3-1-3)**

Provides knowledge of equipment design for chemical processes. Covers the overall procedure of designing a chemical process for various unit operations. It introduces the students to the detailed procedures of equipment design found in most gas and petroleum plants. Special emphasis is also made on mechanical design of the selected equipment.

Prerequisites: CHE 3403, CHE 3323 and CHE 3413

**CHE 3613 - Chemical Reaction Engineering (2-2-3)**

Describes the kinetics of chemical reactions and the design and operation of elementary chemical reactors. Details the principles of the kinetics of homogeneous gas and liquid phase reactions and describes the complex kinetic concepts related to chain reactions, and heterogeneous catalysis. Includes laboratory experiments to reinforce the principles of reaction kinetics.

Prerequisites: CHE 3313 and MTH 2503

Corequisite: CHE 3323

**CHE 4293 - Production Engineering (Offshore) (2-2-3)**

Describes the gas-oil-water separation techniques and equipment. Differentiate between onshore and offshore oil production facilities together with knowledge of Floating Production Storage and Offloading (FPSO) vessels and use of mooring systems. Prerequisite: CHE 2413

**CHE 4403 - Gas Processing (2-2-3)**

Covers the fundamentals of the gas processing operations in the petroleum industry. Discusses methods of hydrocarbon exploration and the conditions required for the formation and accumulation of hydrocarbon reserves. An overview of gas processing from exploration up to final production and transportation as well as gas properties calculations is also included. Focuses on the principles of NGL extraction, LPG fractionation and LNG production. Includes some design aspects of major process units.

Prerequisites: CHE 3323, CHE 3413 and CHE 3513

**CHE 4413 - Chemical Process HAZOP and Risk Analysis (3-1-3)**

Learns specific approaches and techniques to analyze, assess and manage hazards and risks in chemical process industries. Includes HAZOP and semi-quantitative studies for hazard identification and risk analysis. Gains Knowledge on chemical process safety involving accident sequences, methods to eliminate sequence steps and examine statistics to characterize accidents. Reinforces the knowledge through case studies.

Prerequisites: MTH 1113 and CHE 3413

**CHE 4423 - Optimisation and Application in Refinery (2-2-3)**

Introduces optimization principles and linear programming techniques, which serve as a general guide for problem solving in design and operation. Focuses on model development and applications to solve a wide range of process engineering problems using spreadsheet software (Excel or Mathcad). It also introduces the use of commercial software, which is extensively used in the oil, gas and petrochemical industries.

Prerequisites: MTH 2503 and CHE 3413

**CHE 4433 - Petroleum and Petrochemical Processing (2-2-3)**

Covers the essential processing operations in a refinery where crude oil is converted into lighter fuels. Discusses the properties of fuels such as motor gasoline, diesel, jet fuel and heating oils. The production, chemistry and marketing aspects of some important petrochemicals are also covered. The theory is supported by several laboratory experiments.

Prerequisites: CHE 2133, CHE 3413 and CHE 3613

**CHE 4443 - Industrial Water and Effluent Treatment (2-2-3)**

Covers knowledge on the water quality requirements for Industrial use and wastewater quality discharge regulatory norms. Introduces the specific unit operation and unit processes used in industrial water and wastewater treatment including scientific engineering principles on which they are based. Basic concepts of reduce, reuse, recycle of water and wastewater are included. Improves analytical skills through laboratory analysis of water and wastewater samples. Reinforces the knowledge through case studies.

Prerequisites: CHE 2123 and CHE 3413

**CHE 4613 - Chemical Engineering Modelling and Simulation (2-2-3)**

Covers simulation of real chemical processes via harnessing the powerful features of chemical engineering packages being applied to modeling, simulation, optimization, sensitivity analysis, and design.

Prerequisites: CHE 3323 and CHE 3403

**CHE 4623 - Chemical Process Control (2-2-3)**

Covers the theory and practical aspects of chemical process control including the development of outline control schemes and troubleshooting base on control related problems. Conventional control methods as well as computer process control are discussed and laboratory sessions will emphasize the basic principles. Examines the role and importance of process control systems and the dynamic behavior of the process. Learns and applies the concept of P, PI and PIP controllers.

Prerequisites: MTH 2503 and ELE 2153

**CHE 4863 - Special Topics in Chemical Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses.

**CHE 4893 - Directed Study (3-1-3)**

Provides an opportunity to investigate under faculty supervision beyond what is offered in existing courses.

**CHE 4902 - Capstone Design Project I (1-3-2)**

Requires the formation of a team to propose, plan and design a process engineering project. The student team is totally responsible for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisites: CHE 3323, CHE 3413 and CHE 3613

**CHE 4912 - Capstone Design Project II (1-3-2)**

Consists of the implementation, evaluation, and analysis of the process engineering design project carried forward from the previous semester. Though guided by faculty, the student team is primarily responsible for the completion of the project milestones and course objectives. The course requires the integration and application of technological, organizational, communication, and interpersonal skills by the student team. Accurate analysis, implementation, documentation, and presentation skills form the basis for assessment.

Prerequisites: CHE 4902, CHE 3513 and CHE 4613

**CHM 1103 - Engineering Chemistry (3-1-3)**

Covers the fundamental principles and concepts of chemistry, matter, atomic theory, atomic structure and periodic table, electronic configuration, chemical bonding, stoichiometry, chemical reactions and brief introduction to organic chemistry. Classroom concepts are supported by laboratory experiments.

**CIA 2503 - Web Applications Development (3-1-3)**

Develop an understanding of Web Applications and their underlying technologies including the role of client-side and server-side scripts. Apply web design practices and methodologies used in creating interactive web-based user interfaces. Apply the concepts of user authentication, personalisation, data validation and persistence to functioning web applications with access to data stored on a server.

Prerequisite: CIS 1203

**CIA 2513 - Key Components of IoT Architecture for Smart Applications (3-1-3)**

Introduces the IoT architecture and the concepts of smart cities. It provides an overview of the basic technologies required for supporting the IoT and how these technologies and devices are used in mobile apps to support smart cities. Learners will gain an understanding of the impact of the IoT on smart cities. The course provides students with the opportunity to develop a mobile application using the IoT devices. It also introduces typical application scenarios in which IoT provides innovative new services to enhance productivity and save costs.

**CIA 3003 - Introduction to Mobile Applications (3-1-3)**

Examine various industry compliant user interfaces as applied to mobile apps. Learn how to pass data between pages and to use the local storage system. Create smart apps that use the location-based services. Design and develop apps that will be deployed to the actual device that is compatible with the technology.

Prerequisite: CIA 2503

**CIA 3103 - Database Design and Administration (3-1-3)**

Apply data modelling, database design and database administration techniques on an RDBMS server. Learn how to use Structured Query Language (SQL) to define, manipulate, and administer data. Develop an understanding of the concept of database administration and define the duties and responsibilities of database administrators.

Prerequisite: CIS 1303

**CIA 3113 - IoT and Security (3-1-3)**

Students understand unique vulnerabilities in IoT systems that are commonly exploited, discover best practices to integrate into product design processes to enhance product security level, examine emerging threats and learn to think like a "hacker" to gain the skills necessary to create more secure IoT products, assess risk, integrate defensive tools for mitigating risk, and addressing future vulnerabilities throughout the product life cycle.

Prerequisite: CIA 2513

**CIA 3123 - Mobile Game Development (3-1-3)**

Commencing with a comprehensive overview of the games development process including important historical perspectives, content creation strategies, production techniques, platforms, genres, character development and gameplay. Developing critical skills for designing and creating interactive online games, including developing a storyline, storyboarding, interface design, integrating audio and video, and ensuring the key game assets meet the specifications as required.

Prerequisite: CIA 2503

**CIA 3133 - Advanced Application Development (3-1-3)**

Providing students with the knowledge and skills that are needed to understand how to develop software systems that work together in an efficient and productive manner. Concepts such as scalability, reliability, performance tuning, benchmarks, standardization, security, testing, and change control are addressed. The integration with APIs (Application Program Interface) is discussed and utilized with examples such as secured payments processing and social media applications.

Prerequisite: CIA 2503

**CIA 4003 - Advanced Mobile Applications (3-1-3)**

Develop the knowledge and skills required to create mobile applications that connect to external data sources, control device hardware, use cloud storage and its services, and include multimedia content, graphics, and animation. Develop and deploy secured applications by implementing multi-level security and upload your apps to the relevant market place.

Prerequisite: CIA 3003 or CIA 3303

**CIA 4103 - Data Driven Web Technologies (3-1-3)**

Examine how to validate user input on both client-side and server, handle exceptions and maintain application state. Learn how to interact with different data sources. Develop advanced skills in the CRUD operations through server-side codes. Implement security principles through user authentication, roles, and user authorization.

Prerequisite: CIA 2503

**CIA 4203 - Enterprise Database Applications (2-2-3)**

Develop a comprehensive understanding of advanced topics pertinent to database management systems (DBMS) and study how they are being applied in a business environment. Examine the advanced concepts used to design, implement and administer database applications on client server configuration. Using different tools, develop forms and reports, control objects and codes for mitigation of data entry errors, and implement security measures.

Prerequisite: CIA 3103

**CIA 4503 - Advanced Object Oriented Programming (3-1-3)**

Apply object oriented concepts in providing solutions for problems faced by software developers. Demonstrate ability to appropriately apply the concepts of abstract classes, inheritance, polymorphism, interfaces, method overloading, aggregation, compositions, and associations in developing object oriented code. Develop applications that include a database back-end component.

Prerequisite: CIS 2403

**CIA 4613 - Mobile Application Administration (3-1-3)**

Develop an understanding of advanced client-side and server-side mobile application concepts. Create hybrid mobile applications using an appropriate mobile server. Examine modern UI frameworks such as jQuery mobile, DOJO mobile and Sencha Touch UI, and server-based authentication. Deploy the mobile application within an enterprise environment.

Prerequisite: CIS 1403

**CIB 2003 - Technology Based Marketing (3-1-3)**

Examine the basic concepts and processes of effective marketing, focusing on current and emerging technology based marketing strategies, principles and concepts and how technology may impact upon the marketing process. Apply marketing mix strategies for products and services using technology enabled strategies.

Prerequisite: CIS 1003

**CIB 3003 - Human Resource Management and Systems (3-1-3)**

Develop a comprehensive understanding of Human Resource Management theoretical and practical concepts from policies, procedures and activities to HR IT systems. Examine HR processes and systems, tools and contemporary developments and assess their impact on the success of organizations both locally and internationally

Prerequisite: CIS 1203 or CID 1003 and CID 1053

**CIB 3013 - Data Analytics (3-1-3)**

Communicating the value of data as a corporate asset to outline opportunities for cost savings and revenue generation. Applying data governance roles and responsibilities to assure data integration. Use metrics for quality of data managed in a technical solutions portfolio. Preparing data to be fit for purpose for analytics and business intelligence to ensure the analysis presented is the right data to the right person at the right time. Managing data to meet corporate security and classification standards.

Prerequisite: CIS 2003

**CIB 3103 - Object Oriented Analysis and Design (3-1-3)**

Examine one practical, complete, object-oriented analysis and design (OOAD) road map from requirements gathering to system design. Develop the concepts and techniques necessary to effectively use system requirements captured in use cases to develop a robust design model using OO architecture, human computer interaction and data management designs

Prerequisite: CIS 2403

**CIB 3113 - Business Finance (3-1-3)**

Provides students with financial and accounting concepts and the skills to integrate financial data with relevant information systems. It discusses financial and accounting concepts and issues that will contribute positively to the students ability to design integrated business solutions enabled by information technology.

Prerequisite: CIB 3203

**CIB 3123 - Big Data Technology (3-1-3)**

Describing the Big Data landscape including examples of real world big data problems. Explaining the Big Data and why each impacts data collection, monitoring, storage, analysis and reporting. Getting value out of Big Data by using a 5-step process to structure analysis. Identifying big data problems and recast big data problems as data science questions. Summarizing the features and value of core Hadoop stack components including the YARN resource and job management system, NoSQL databases, and the MapReduce programming model.

Prerequisites: CIS 1303 and CIS 2403

**CIB 3203 - Accounting For Managers (3-1-3)**

Introduces students to accounting as a system for gathering and reporting information, and to its role in business decision-making. It covers the major steps of the accounting cycle as it relates to the processing of financial transactions through an accounting information system in each accounting period. The students will learn accounting terminology and principles; prepare financial statements, operating budgets and financial budgets; and perform Cost-Volume-Profit analysis.

**CIB 3303 E-Business Principles (3-1-3)**

Discuss the evolution of e-Business. Develop a sophisticated understanding of e-business and evaluate its opportunities, limitations and impact on traditional businesses and institutions especially for UAE-based organizations. Evaluate current and emerging e-business strategies, technologies and related security, legal and ethical issues.

Prerequisites: CIS 1003 and CIS 2103

**CIB 3403 - Advanced Database Technologies (3-1-3)**

Discuss advanced database technologies and business intelligence tools that help modern day enterprises store, access and analyse data essential in decision making. Focus on such database technologies as data warehousing, data mining, XML data and information retrieval. Assess the importance of data quality and such issues as integrity, consistency, concurrency and security.

Prerequisite: CIS 1303 or CID 1063 and CID 2003

**CIB 4003 - E Business Applications Development (2-2-3)**

Develop the skills required to build e-commerce applications. Develop server side applications that generate content, maintain state, authenticate users, connect to databases, and provide security of transactions and confidentiality of data. Build a complete e-commerce web application that handles memberships, online catalogues, shopping cart module, and check out.

Prerequisite: CIS 1203 or CID 1003 and CID 1053

**CIB 4203 - Customer Relationship Management Systems (3-1-3)**

Use Customer Relationship Management (CRM) to support business processes and development. Examine how to utilise the information technology resources, strategies, software and processes needed to support an effective CRM strategy. Assess, in particular, CRM techniques, to enhance customer service, sales force effectiveness and marketing strategy. Evaluate the benefits of creating customer loyalty, developing market intelligence and embedding a customer relationship management system into an organisation.

Prerequisite: CIS 1003

**CIB 4203 - Customer Relationship Management Systems (3-1-3)**

Use Customer Relationship Management (CRM) to support business processes and development. Examine how to utilise the information technology resources, strategies, software and processes needed to support an effective CRM strategy. Assess, in particular, CRM techniques, to enhance customer service, sales force effectiveness and marketing strategy. Evaluate the benefits of creating customer loyalty, developing market intelligence and embedding a customer relationship management system into an organisation.

Prerequisite: CIS 1003

**CIB 4603 - Enterprise Resource Planning (3-1-3)**

Develop a sophisticated understanding of the concept of ERP systems and how business processes interact in an ERP system in areas of: Procurement, Materials Management, Production Planning and Execution, Sales Order Management, Financial Accounting and Controlling, and Enterprise Asset Management. Develop in-depth theoretical and practical knowledge regarding ERP through exercises and case studies.

Prerequisite: CIS 1003

**CIM 2003 - Graphic Design for Multimedia (2-2-3)**

Introducing the fundamental elements and principles of graphic design in both print-based and digital applications. Developing an understanding of the design process from the development of concepts and visual to the production of Web/print-ready images. Demonstrating an understanding of typeface selection. Discussing aspects of colour theory systems. Compositing, rendering and production techniques are demonstrated using visualisation, abstraction methods and industry-standard image processing software.

Prerequisites: CIS 1203 or CID 1003 and CID 1053

**CIM 2103 - Storyboarding for Multimedia (2-2-3)**

Build a visualisation to present an idea or plan prior to developing a linear or interactive multimedia application. Employ aspects of storyboard production including interpretation of concepts and scripts, layout and design and drawing for user interfaces. Implement interaction design using software skills for the production of digital visualisation techniques, movie and animation storyboarding including animatics and designing layout and interaction for game levels.

Prerequisites: CIS 1203 or CID 1003 and CID 1053

**CIM 3003 - 2D Animation (2-2-3)**

Discuss the history and types of 2D animation, and the theory behind the concept of animation, namely, the persistence of vision. Identify the basic principles of 2D animation. Create 2D animation in linear and interactive applications. Describe the concepts and mechanics of sound synchronisation, lip-synching and integration of sound to 2D animated sequences. Utilise professional animation tools and applications to develop 2D digital animation sequences that incorporate contemporary animation principles and techniques.

**CIM 3113 - Motion Graphics (3-1-3)**

Building technical proficiency in the field of motion graphics by further developing skills in vector graphics, animation and video effects, and applying these skills to three well-established applications of Motion Graphics: Music Videos, Animated Info-graphics and Animated 3D Logos. Students will study Motion Graphics production pipelines from concept to execution and learn to work with shot descriptions, storyboards, 2D vector graphics video stock footage, 3D Graphics and video effects software.

Prerequisite: CIM 2003

**CIM 3203 - Programming for Multimedia (3-1-3)**

Introduce programming as a creative tool for digital image and audio processes. Develop an understanding of object-based constructions and multimedia delivery requirements. Examine the concept of event-driven programming, and identify how it can be utilized to introduce interactivity and animation into a multimedia application. Discuss the use of GUI elements to enhance the interactivity of multimedia application and implement user interaction using various input devices. Develop multimedia programs with animation features for games or educational applications.

Prerequisite: CIS 1403

**CIM 3403 - 3D Modelling and Animation (2-2-3)**

Explain 3D modelling for 3D animation and develop an understanding of the basic structure of 3D modelling and virtual environment creation. Create scenes with 3D models of objects and characters, using different materials, surfaces, textures and shadings. Apply proper timing by using key-frames and the principles of animation to develop 3D animations. Animate complex objects utilising skeletons, rigging, constraints and kinematics. Apply appropriate lighting and proper camera type and attributes to render 3D animation.

CIM 3503 - Computer Game Design and Development (3-1-3)

Examine the basic concepts and techniques of electronic game design and development. Explore the history of games and genres, level and model design, theory of Funativity, and game design and processes. Develop the skills required to build a basic computer game using scripting and programming including computer graphics, animation, and artificial intelligence.

Prerequisite: CIM 2003

**CIM 4003 - Multimedia Scripting (3-1-3)**

Review advanced concepts of scripting for multimedia, and learn how to design and develop sophisticated multimedia products for education, entertainment and business through the use of advanced scripting and development tools. Apply the design process and various design components engaged in a typical interactive multimedia application or game. Develop an interactive multimedia application or game that uses scripting techniques for player interaction with other characters and objects in the game environment.

Prerequisite: CIM 3203

**CIM 4103 - Web Authoring and Administration (2-2-3)**

Examine advanced knowledge and technologies needed to create, publish and manage professional-quality websites that meet the web guidelines and standards for HTML 5, CSS 3 and accessibility. Design and develop functional and a professional-level website for a given small business organisation. Integrate multimedia elements using HTML5, animation and industry accepted multimedia software packages. Employ graphics, audio, video, interactivity element for a web-based presentation using JavaScript, CSS styling, API and Custom Controls.

Prerequisite: CIS 1203 or CID 1003 and CID 1053

**CIM 4203 - Virtual Reality and Simulation (2-2-3)**

Examine emerging electronic technology of Virtual Reality (VR). Learn key concepts needed to understand and evaluate VR systems, applications, simulators, and their impact on future digital systems and user interfaces. Discuss key simulation topics including stochastic modeling, random number generators, discrete-event simulation approaches, simulated data analysis, and simulation variance reduction techniques. Evaluate current VR technology systems. Produce an interactive simulation for a system that requires the use of prediction methods.

Prerequisites: CIM 3303 or CIM 3403 and CIM 4003

**CIM 4303 - VFX, Audio, Editing and Composition (3-1-3)**

Discuss the entire production process including key production and post-production, digital film-making, compositing, editing, motion graphics, effects and computer graphics interface (CGI). Develop a critical understanding of the techniques and technology used to create high quality digital visual effects. Build the necessary skills required to work in post-production. create a rich portfolio of work that showcases student technical, artistic and team-working abilities.

Prerequisite: CIM 2103 or CIM 3103

**CIN 2003 - Enterprise Network Services (3-1-3)**

Explore concepts and technologies behind domain based enterprise networks. Install, configure and administer an enterprise network operating system and configure protocols, services and server functions such as storage, backup and disaster recovery to the level required to effectively administer a secured domain based enterprise networks.

Prerequisites: CIS 1103 or CID 1013 and CID 1023

**CIN 2103 - Networking Fundamentals (3-1-3)**

Exploring the OSI and TCP/IP layered models is fundamental to understanding how computing devices communicate with each other. Analyse the role the various protocols play in relation to physical and logical addressing, network types, end-to-end connectivity and application requirements and develop abilities to assess key factors in designing and building effective computer networks.

Prerequisites: CIS 1103 or CID 1013 and CID 1023

**CIN 2203 - Routing Protocols (3-1-3)**

Understanding of how routers learn about remote networks and find the best path for data packets to reach a final destination is essential to becoming a competent networking professional. Select and configure routing protocols and implement enterprise solutions such as Access Control Lists (ACLs) and Network Address Translation (NAT) to create secure network connectivity within organisations and to the public Internet.

Prerequisite: CIN 2103 or CID 1203 and CID 2203

**CIN 3003 - LAN Switching (3-1-3)**

Discuss the features of a layer 2 and layer 3 switching, and learn how a switch interconnects and communicates with other switches and routers in networks. Build efficient, secure and reliable switched networks of varying size in response to business needs and apply effective troubleshooting techniques to ensure reliable communication between all devices on the network.

Prerequisite: CIN 2103 or CID 1203 and CID 2203

**CIN 3103 - Wireless Networks (3-1-3)**

Learn the fundamentals of wireless communication including terminologies and behaviors associated with radio frequencies, components, standards and relevant organizations. Work in teams to perform case analysis, site surveys and measurement techniques to plan, design and implement secure wireless networks and evaluate their performance

Prerequisite: CIS 1103

**CIN 3203 - WAN Technologies (3-1-3)**

Explore how Wide Area Network technologies such as PPP, Frame relay and Broadband technologies are used to connect networks over great distances and allow remote business branches to communicate securely. Critically evaluate case based scenarios and select appropriate procedures and technologies to design, build and troubleshoot enterprise network solutions in response to complex business needs spanning multiple locations

Prerequisite: CIN 2203

**CIN 3303 - Network Security (3-1-3)**

Investigate the principles of network security including threat identification, risk analysis, risk management and risk avoidance. Configure network devices including routers and firewalls to prevent network attacks and to protect vital business assets. Analyse risk and assess vulnerabilities based on case scenarios and develop and implement policies, procedures and technologies to avoid potential threats, balancing business and security needs.

Prerequisite: CIN 2103 or CID 1203 and CID 2203

**CIN 3503 - Virtualisation Technologies (3-1-3)**

Identify the key concepts of virtualising a classic data centre. Build a virtual infrastructure and manage resources in the virtual environment. Implement disaster recovery solutions to provide Business Continuity (BC) and Disaster Recovery (DR) for the virtual environment. Secure the virtual environment using industry best practices and maintain security for the virtual environment. Prerequisite: CIS 1103 or CID 1013 and CID 1023

**CIN 4003 - Routing Solutions for the Enterprise (3-1-3)**

Develop a critical understanding of design, configuration and implementation of exterior gateway protocols, remote connectivity and path control in enterprise networks. Explore route redistribution, path control branch and mobile connectivity. Apply the needed skills to design, implement and configure multiple routing protocols in a large network.

Prerequisite: CIN 2203

**CIN 4103 - Network Management (3-1-3)**

Examine the fundamental concepts of network management, network management protocols, network management tools and implementation. Analyse and troubleshoot networks and examine various standards used for network management. Apply industry standards into practice and build a robust network operation and management plan for businesses.

Prerequisite: CIN 3603

**CIN 4113 - Scalable Computer Network (3-1-3)**

Managing a scalable and highly available enterprise network. Understanding the role of link aggregation and first hop redundancy protocols to ensure that the enterprise has high speed switched network. Implementing network Layers Redundancy and availability in a switched network. Optimizing and troubleshooting interior routing protocols.

Prerequisites: CIN 2203 and CIN 3003

**CIN 4203 - Voice over Internet Protocol (VoIP) Fundamentals (3-1-3)**

Focus on the VoIP network design, planning and implementation. Investigate the operation and troubleshooting of networks with integrated services for voice over IP (VoIP). Examine the role of Quality of Service (QoS), coding of voice and call setup in IP telephony networks.

Prerequisite: CIN 2003

**CIS 1003 - Information Systems in Organisations and Society (3-1-3)**

Understanding the fundamental and changing role of information within organization and society. Exploring how information technology (IT) supports decision making. Enabling improvements in communication, quality, efficiency, and effectiveness. Investigating emerging technologies and the local and global impact of such technologies on individuals, organizations, and society.

**CIS 1103 - Hardware and Networking (3-1-3)**

Introduces the fundamental computer systems hardware, architecture and various components. Provide a comprehensive understanding of modern computer systems, by covering variety of computer devices, and peripherals. Explore the various communication techniques based on the network layer model including application, transport, network and link layers. Develop an understanding of peer to peer networking, computer network security and computer network management.

**CIS 1203 - Web Technologies (3-1-3)**

Introduce the basic concepts of the World Wide Web and its underlying technologies. Define the functions of web browsers and web servers for accessing resources over the internet. Provide a comprehensive understanding of various multimedia components such as 2D graphics, 3D graphics, audio and video and integrate these components into website development. Create, test and publish a website, maintaining a range of webpages and sites using HTML, JavaScript, and CSS that integrate multimedia applications.

**CIS 1303 - Data and Information Management (3-1-3)**

Examining relational database concepts and exploring simple database application development. Identifying organisational requirements, database design and implementation, and business application development. Developing practical skills in building database systems using different types of queries to retrieve and/or manipulate data, through customised forms and reports.

**CIS 1403 - Fundamentals of Programming (3-1-3)**

Exploring the fundamental concepts and terminology of programming through logical thinking/problem solving. Designing and writing simple computer programs within an integrated development environment. Covering the concepts and techniques of variables, data types, sequence, selection, iteration, classes, objects, methods and the mechanics of running, testing and debugging programmes.

**CIS 2003 - Statistics and Probability (3-1-3)**

Discussing the fundamental concepts of probability and statistics with an emphasis on their application in Information Technology. Developing skills in probabilistic and statistical intuition for application in the discipline. Exploring the elements of discrete probability, sampling and descriptive statistics, and application of statistics and probability in Information Technology.

Prerequisite: LSM 1003

**CIS 2103 - Principles of Information Assurance, Security and Privacy (3-1-3)**

Describing the key concepts related to security and assurance of information assets. Exploring information risks, security frameworks and controls, and relevant legal, ethical, and professional issues. Discussing security-related activities, such as inspection and protection of information assets, detection of and reaction to threats, and examining pre- and post-incident procedures. Designing and implementing an information assurance plan to protect an organisation's information.

**CIS 2203 - Applied Discrete Maths (3-1-3)**

Introduce the functional computational aspects of a variety of data structures including sets, relations, discrete functions, graphs and trees. Engage with formal systems, including propositional and predicate logic, sequences, summations, and mathematical induction. Develop the capacity to read and construct valid proofs of the properties of algorithms.

Prerequisites: LSM 1003 and CIS 1403

**CIS 2303 - Systems Analysis and Design (3-1-3)**

Describing established and evolving methodologies for the plan, analysis, design, and development of an information system using traditional and structured system analysis method. Identifying the systems development lifecycle phases, modelling tools and techniques, testing procedures and the need for systems evaluation.

Prerequisites: CIS 1303 or CID 1063 and CID 2003

**CIS 2403 - Object Oriented Programming (3-1-3)**

Describing object oriented programming and its advanced characteristics. Exploring the object oriented programming paradigm; objects and classes; data abstraction and encapsulation; and exception handling, and the Collections Framework. Demonstrating the necessary skills to write, debug and implement programmes using OO terminology.

Prerequisite: CIS 1403

**CIS 2806 - Work Related Experience I (0-15-6)**

This course is designed as a framework within which a range of work related learning activities can be accommodated to meet defined learning outcomes. It gives the flexibility, for example, for students to learn from work experience and to receive an understanding of business and technology and its real life operations (where possible in their chosen major topic) or to undertake an industry based project which meets the same outcomes.

Prerequisite: CIS 2303

**CIS 2903 - Operating Systems (3-1-3)**

Introduces operating system concepts, architecture, platform and features. Topics include process synchronisation, intercrosses communications, processor scheduling, memory management, virtual memory, I/O, and file systems. Open Source operating system will be used to perform installations, managing storage, managing files, administering users and group, installing and configuring local services.

Prerequisites: CIS 1103 or CID 1013 and CID 1023

**CIS 3003 - Human Computer Interaction (2-2-3)**

Exploring the fundamental concepts of human-computer interaction. Developing skill in understanding usability and testing, user-centered design, human cognitive principles and models, information and interactivity structures, interaction styles and techniques. Applying dialogue method, response time and display rates, information presentation, interactive devices, information search and visualization and hypermedia to develop an interface of computer-based solutions.

Prerequisite: CIS 2303

**CIS 3203 - Enterprise Architecture (3-1-3)**

Develop advanced skills and knowledge about the foundational concepts of enterprise architecture and how it serves to integrate strategic, business, and technology planning methods to support enterprise-wide information technology resource development in the context of business requirements. Evaluate principles and best practices of enterprise architecture, and develop a comprehensive approach to articulating the subject matter involving real-world case studies.

Prerequisite: CIS 2303

**CIS 3303 - System Architecture and Integration (3-1-3)**

Provides a comprehensive understanding of a number of system integration techniques that address specific requirements, including software and hardware acquisitions, integration issues and acceptance testing. Diagnose and troubleshoot systems interoperability and interface integration issues. Develop project plans that incorporate the influence of business processes and culture on system architecture decisions.

Prerequisite: CIS 2303

**CIS 3806 - Work Related Experience II (0-15-6)**

Designed as a framework within which a range of work related learning activities can be accommodated to meet defined learning outcomes. It gives the flexibility, for example, for students to learn from work experience and to receive an understanding of business and technology and its real life operations (where possible in their chosen major topic) or to undertake an industry based project which meets the same outcomes.

Prerequisite: CIS 2803

**CIS 4203 - Information Technology Strategy and Governance (3-1-3)**

Provides an understanding of IS Strategy and Governance, decision rights, strategic frameworks and mechanisms, alignment of strategy, governance and performance with related change management issues and schemes. The course highlights the fact that IS strategy and governance refers to allocation of responsibilities for the control of IS that enable accountability, participation, predictability and transparency. The course emphasises the responsibility of the board of directors and executive management in an organisation, and their integral role in enterprise governance.

**CIS 4403 - Cloud Computing (3-1-3)**

Discuss classic data centres and how they can be migrated to a cloud solution. Examine cloud infrastructure solutions and build virtualised servers, desktops, applications and services. Implement a private cloud using the specification of a particular organisation.

Prerequisite: CIS 1003

**CIS 4603 - Project Management (3-1-3)**

Developing an understanding of the basics of project management concepts and methods. Examining the project management framework, including key terminology, project management context, and project management processes. Demonstrating skills in managing budgets, schedules, and human/material resource allocations activities associated with project management quality, communications, risk and procurement.

**CIS 4906 - Capstone Project (Integrative and Consultancy Focused) (8-1-6)**

Applying and integrating the knowledge of the development life cycle project management, development tools, and skills gained throughout the major to plan, analyse, design, and build a fully functional information system component to solve a business problem for organizations. Demonstrating an understanding of the skills in documenting and presenting the project to company representatives

Prerequisite: CIS 3103 or CIS 4603

**CMC 2303 - Corporate Communication I (3-1-3)**

Explores the principles and concepts of corporate communication including key definitions, dynamics and the tools of corporate communication. By developing the skills needed to execute and analyse essential strategies or tools, helps students engage with various corporate stakeholders as well as overcome challenges in the contemporary corporate world.

**CMC 3003 - Digital Marketing (3-1-3)**

Introduces students to the concepts of digital marketing enabling them to understand the fast changing world of digital marketing. Offers an overview of the role of digital marketing in the communication industry preparing students to create, communicate and track effectiveness of marketing messages. The course examines a variety of digital marketing channels focusing on current trends and best practices as per industry updates and standards.

**CMC 3503 - Social Media (3-1-3)**

Social Media has played a critical role in changing the landscape of the corporate communication industry in the past few years. This course introduces students to different issues arising in the online communication field focusing on opportunities and challenges available to organizations. The course examines the evolution and practice of social media and how it is changing human interaction, brand positioning, and reputation management. Students use a variety of social media networks including Facebook, Twitter, LinkedIn, YouTube, Instagram, Pinterest, and Google+.

**CMC 4003 - New Trends in Corporate Communication (3-1-3)**

Discuss new trends and disruptive technologies that have an impact on Corporate Communications. Developing processes and techniques to evaluate new trends, acquiring new knowledge and skills required for the adaptation. Several case studies will be used based on current trends at the time when the course is offered. Prerequisite: CMC 2303

**CMC 4013 - Effective Corporate Communications in a Globalised Workplace (3-1-3)**

Learning strategies on how to strengthen relationships with co-workers and other stakeholders from diverse cultural backgrounds, both inside and beyond the organization. Considerations of cultural values when employee communicates in a multicultural community and workplace. Discussing effective communication skills required to build relationships with colleagues. Adopting appropriate intrapersonal and interpersonal, verbal and nonverbal, communicative strategies to present information. Building personal profile and appropriately align self in a globalized workplace.

**CMC 4023 - Media Relations (3-1-3)**

Prepares students to enhance their writing skills for the media and develop media relations management strategies in a corporate environment. Drawing on current media situations, this course aims to develop writing and distribution of messages in a variety of formats to multiple media channels and platforms. It also evaluates best media practices and principles in the industry and critically discusses the strategies that should be used to ensure the success of an event/PR campaign.

Prerequisite: COM 2003

**CMC 4033 - Corporate Communication II (3-1-3)**

Examines a variety of corporate communication functions such as crisis communication, investor relations, issues management and public affairs, media relations, internal communication and corporate social responsibility. Explores a variety of local, regional, and international case studies, discussing the complexities of the world of corporate communications. Develops skills to help write case studies on relevant corporate communication issues.

Prerequisite: CMC 2303

**CMC 4623 - Communication Theory (3-1-3)**

Evaluates various communication theories and how they relate to society and culture. The emphasis is on the concepts, meanings, effects and impacts of diverse forms of communication within contemporary societies. The communication processes are explored within the context of contemporary professional practice, focusing on the nature of theory and research methods along with media content.

**CMC 4713 - Media Law and Ethics (3-1-3)**

Introduces broader concepts of media laws and ethical issues in media professions including journalism, public relations, advertising and digital media. Focusing on media laws and ethics in the UAE, analyses past and developing cases to enhance students' understanding of the importance of the legal and ethical boundaries within which media professionals operate. Increases awareness about defamation and intellectual property rights, while evaluating ethical issues and moral values such as fairness, balance and bias."

**CMC 4803 - Internal Communication Management (3-1-3)**

This course provides an in-depth look at the internal communication function inside organizations and its role in reputation management. The course explains the primary role of the IC function in creating employee engagement, the tools and vehicles used to communicate internal messages, and how to design these messages. It also offers a hands-on approach to learning IC audit, research, and planning.

Prerequisite: CMC 4033

**CMC 4806 - Final Project - Corporate and Media Communication (8-1-6)**

Integrates all the skills, competencies and knowledge students have learned in Corporate and Media Communications to accomplish a project of industry standard. Brings together professional, creative and critical approaches to conceptualise, research, plan, develop, execute and evaluate an original and independent project, which will be subjected to peer and industry review.

Prerequisite: CMC 3613

**CMV 2003 - Motion Graphics (3-1-3)**

Builds students' technical proficiency in the field of motion graphics by further developing skills in vector graphics, animation and video effects and by applying these skills to three well-established applications of Motion Graphics: Music Videos, Animated Info-graphics and Animated 3D Logos. Students will study Motion Graphics production pipelines from concept to execution and learn to work with shot descriptions, storyboards, 2D vector graphics video stock footage, 3D Graphics and video effects software.

Prerequisite: COM 1123"

**CMV 3003 - Viral Video for Social Media (3-1-3)**

Discussing viral video for social media and broadcast markets. Researching the psychology and methodology behind creating clever viral videos. Discuss key benefits and challenges of Viral videos. Covers a comprehensive view of the types of viral videos and how you can use viral content to reach your target audience. Covering how to create a viral video for social media campaign, explore the power of viral video and develop the necessary skills to become a social media professional.

**CMV 3503 - Editing (3-1-3)**

Introduces elementary post-production techniques and the history and theory of editing through critical analysis and discussion of selected examples. Using industry-standard software and tools, familiarises students with the hands-on editing exercises and assigned projects, skills and post-production techniques, including sound mix and colour grading.

**CMV 3513 - Production Skills I (3-1-3)**

Introduces essential elements of professional video production with an emphasis on visual literacy, storyboarding, shot composition, framing and shot types. Applies the proper use of sound, appropriate selection of microphones and lighting equipment. Students create a video production (such as a P.S.A., information piece, or news item) and critique their own work and the work of others.

Corequisite: CMV 3503

**CMV 4003 - Film and Video Distribution and Marketing (3-1-3)**

Distribution, Marketing and Presentation introduces students to the skills necessary to support and enhance the student's artistic career in the film and video production industry. The subject focuses on presenting themselves and their short video works to the audience at large via a variety of distribution platforms, marketing and publicity strategies. Corequisite: CMV 4806"

**CMV 4013 - Screen Culture (3-1-3)**

Screen Culture will introduce basic approaches to the main canons and genres of cinema; the codes, conventions and narrative structures, from the silent era to contemporary cinema and film as art. Through exploring a diverse range of cinematic approaches and styles, the work of cinema innovators is highlighted. Students will develop their own vocabulary and cinema aesthetic to apply to their projects by reflecting critically on their own production work and the work of fellow students.

**CMV 4103 - Production Skills II (3-1-3)**

Students extend video production skills with the introduction of additional creative concepts and technical skills. Working in small teams in different roles, learning new skill sets, including crew hierarchy, set procedures, budgets and realistic production schedules. The emphasis of the course is on enhancing technical and creative abilities in different phases of production. Students produce single camera productions working as a cohesive unit.

Prerequisite: CMV 3513

**CMV 4203 - Video Scriptwriting (3-1-3)**

Students will examine the advantages and limitations of writing for the screen through lectures, group discussions and film screenings. Students undertake short writing exercises, learning how to write loglines, treatments and scripts using industry standard software for both narrative and documentary productions.

**CMV 4613 - Short Video Production (3-1-3)**

Through a collaborative process, explores visual storytelling in narrative format at all stages of a video production - from concept to distribution of the finished project. The course initiates the creative processes of brainstorming, visual storytelling, guiding/directing actors, and choreographing the best possible shots and camera movements for visual conveyance of a story.

Corequisite: CMV 4203

**CMV 4713 - Documentary (3-1-3)**

Develops concepts and skills for producing, shooting, lighting, sound gathering and editing for documentary production. Enhances technical skills in operation of video equipment, set location lighting solutions, sound recording equipment and utilise editing systems to produce a cinematic documentary to convey emotion and meaning. Generates professional competencies by focusing on evaluation techniques to improve storytelling skills, creative decision-making, and creating proposals for funding a project needed to work as in the industry.

Prerequisite: CMV 3513

**CMV 4803 - Advanced Edit and Effects (3-1-3)**

Explores creative possibilities for non-linear video editing, including aesthetics, composition (both music and sound design), titles design, compositing and special effects. Analyses different approaches to editing exploring impact on viewers. Integrates the theory of editing with hands-on experience by including a series of short practical components.

**CMV 4806 - Final Project - Video Production (8-1-6)**

Integrates all the skills, competencies and knowledge students have learned in Video Production to accomplish a project of industry standard. Brings together professional, creative and critical approaches to conceptualise, research, plan, develop, execute and evaluate an original and independent project, which will be subjected to peer and industry review.

Prerequisite: CMV 3606 or CMV 3553 or CMV 3613 or CMV 3503

**COM 1003 - Digital Storytelling (3-1-3)**

Provides hands-on experience to tell a story in digital format using basic techniques and tools. Applying audio, video and text in a simple narrative structure, students develop projects to familiarise themselves with the process of digital media production. Encourages to deconstruct and critically reflect on story, coherence and production value

**COM 1123 - Introduction to Media Technology (3-1-3)**

Introduces students to industry standard tools, techniques and processes of various media technologies, in particular vector and raster graphics, 2d animation and interactive media. This course will provide a foundation for students to apply and develop their technical skills during their study program.

**COM 1143 - Visual Communications (3-1-3)**

Introduces the language of visual communication and drawing to build knowledge of the elements and principles of design in the context of visual communication by examining the multiple ways in which they interact. The course aims at developing practical communication skills and proficiencies needed to enter the creative industries sector through drawing as a tool to translate broad concepts into visual images and to illustrate the elements and principles of design.

**COM 1153 - Media Literacy (3-1-3)**

Introduces students to the historical and conceptual framework media literacy concepts and increases their functional literacy so that they can access, analyze, evaluate and create media messages of all kinds. The course provides the tools and skills that help to understand the role media plays in shaping, reflecting and, at times, manipulating social realities. The course offers insight into media production processes and encourages critical thinking, so that students can understand and navigate through complex media environment we live in.

**COM 1203 - Photography (3-1-3)**

Develops conceptual and technical skills needed to function as a professional photographer working in a variety of media and platforms. Explores both analog and digital technology as students work in an experimental and critical environment to appreciate both historical developments and contemporary practice in commercial photography. Leads to the creation of a mini digital portfolio.

**COM 1223 - History of Media and Design (3-1-3)**

Through research and practical projects, this course introduces major historical genres and movements in design and media, examining how art and design movements, styles and practices, continue to influence design and media today. The course reviews formal characteristics and principals of design movements and media. The course will help students develop their own language and critical examination of the practice of design and media.

**COM 2003 - Convergent Journalism (3-1-3)**

Introduces students to the practice of journalism and helps them understand the role journalists' play in reporting, processing and production of news, multi-platform news environment, and application of journalism. Covers the basic theories of mass communication as well as ethics and laws that are governing news reporting and editing. Explores the definitions, values and principles of news to create a broad understanding reporting, editing and presenting news.

**COM 2103 - Creative Writing (3-1-3)**

Explores the basic elements of creative fiction and non-fiction writing, including characters, conflict, setting, narrative and dialogue as well as writing the news, press releases, copywriting, etc. Students will read a variety of works of fiction as well as texts on writing creatively. Students will develop vocabulary for talking about how fiction works and how to write creatively. Frequent writing exercises will give students the opportunity to practice and hone their creative writing skills.

Prerequisites: COM 1003 and COM 1153

**COM 2313 - Project Management for Media (3-1-3)**

Provides the essential knowledge of project management principles, methods, tools and techniques used in media projects. Develops a broader understanding of what constitutes a project, and the role of a project manager in project set up, execution, control, analysis and reviews. Applying industry-standard tools and practices, media projects are simulated to provide authentic learning experience.

**COM 3013 - Interviewing and Presenting (3-1-3)**

Developing techniques to perform interviews for different media (TV, radio and newspaper). Selecting the appropriate people for their stories, preparing for the interviews, asking the right questions, and managing the interviews to stay focused on the main subject in the given time. Learning how to summarize the interview and their notes, editing the information and creating the final story in the appropriate media format.

**COM 3606 - Work Placement I (0-15-6)**

Provides students with work experience in a professional work environment to develop their work ethics, habits and practices necessary for entering into employment. Under the mentorship of a work supervisor, students take different job roles to build competencies and skills in real work situations that enable them to put in practice the vocational skills learned at the college. Prerequisite: COM 2313

**COM 3616 - Work Placement II (0-15-6)**

Provides students with work experience in a professional work environment to develop their work ethics, habits and practices necessary for entering into employment. Under the mentorship of a work supervisor, students take different job roles to build competencies and skills in real work situations that enable them to put in practice the vocational skills learned at the college.  
Prerequisite: COM 3606

**CSF 2113 - Programming for Information Security (3-1-3)**

Developing the necessary coding skills for the Security and Forensics students to carry out security related tasks. Identifying building blocks of a specific scripting language to develop scripts that fulfill the requirements for automating tasks, finding weaknesses, exploiting vulnerabilities, and many other security and forensics related objectives.  
Prerequisite: CIS 1403

**CSF 3003 - Cyber Law and Ethics (3-1-3)**

Providing an insight into the laws and regulations of cyberspace, from a general understanding of the legal issues in e-commerce security and privacy, to the legal, managerial, and ethical issues affecting technology enabled organizations.  
Prerequisite: CIS 2103 or CID 2013 and CID 2053

**CSF 3103 - Incidence Response and Disaster Recovery (2-2-3)**

Developing two threads: Analyzing and responding to attacks, and recovering the system from attacks or disasters. Prioritizing attacks facing an organization using a weighted analysis table. Recovering from attacks, incidents and disasters by implementing a variety of tools. Identifying system vulnerabilities, taking appropriate countermeasures, developing an incident response and recovery plan and finally implementing a disaster recovery plan to minimize downtime.  
Prerequisite: CIN 2003 or CID 2213 and CID 2223

**CSF 3203 - Intrusion Detection and Ethical Hacking (2-2-3)**

Utilising intrusion detection techniques for the purpose defending and securing organisational information infrastructures. Identifying methods used in computer and network hacking in order to better protect systems from such intrusions. Describing the role of a penetration tester, including what an ethical hacker can and cannot do legally. Examining different types of malicious software. Implementing hacking and tools and techniques to determine potential system vulnerabilities. Reflecting on the purpose of defending organisational and information infra-structures.  
Prerequisite: CSF 2903 or CIS 2903

**CSF 3403 - Computer Forensics and Investigation (2-2-3)**

Analyzing various computer systems that have been compromised. Performing a systematic investigation, recovering critical data and aiding authorities in tracking those who caused the security breach. Analyzing and investigating digital evidence as related to UAE Cyber Law. Producing evidence for presentation in a UAE court of law. Analyzing crime incident reports using software and hardware computer forensics tools. Recovering digital data using forensics techniques. Developing a report of the breach.  
Prerequisite: CIN 2003 or CID 2213 and CID 2223

**CSF 3603 - Cryptography and Network Security (2-2-3)**

Introducing key concepts of encryption such as ciphers, symmetric and asymmetric encryption. Identifying system attacks and countermeasures. Recognizing the basic concepts of cryptography using various encryption techniques. Analyzing public key infrastructure, digital signatures and hash functions. Applying cryptosystems to user authentication, email, IP/web security and wired and wireless networks.  
Prerequisite: CIN 2003 or CID 2213 and CID 2223

**CSF 4003 - Security and Risk Management (3-1-3)**

Recognizing Information Security from the perspective of Management. Discussing key information security management concepts and organisational roles for access, control, communication and business continuity management. Analysing methods of information security risk assessment, intellectual property protection, organisational structure assessment and modeling of critical infrastructure protection. Developing a contingency planning needed to deal with unexpected events. Implementing analytical tools for quantifying risk and the costs and benefits of various mitigation tools.  
Prerequisite: CSF 3403 or CSF 2103

**CSF 4103 - Web Application and E-Commerce Security (3-1-3)**

Discovering and exploiting security flaws and major vulnerabilities inherent in web applications. Applying various tools for mapping an e-commerce web application in order to identify its vulnerabilities. Identifying tools and techniques to secure vulnerabilities in client-side controls, authentication, session management, and access controls. Initiating injection attacks, and appropriate countermeasures to test and secure web applications such as online banking and e-commerce. Applying various defense mechanisms to secure web applications against possible attacks.  
Prerequisites: CSF 3603 and CSF 3203 or CSF 2103

**CSF 4203 - Telecommunications and WAN Security (3-1-3)**

Identifying different data communication and transmission techniques in telecommunication and WAN. Discussing TCP/IP and OSI protocol reference models and configuring circuit-switching and packet-switching technologies. Implementing various WAN protocols including Frame relay, ATM, MPLS and Wireless WAN. Designing and configuring WAN technologies and VPN for business data communications.  
Prerequisite: CSF 3603

**CSF 4613 - Security Intelligence (3-1-3)**

Express a more developed understanding of the anomalies and suspicious activities related to Information Technology. Exploring a deep visibility into network, user, application activity, and Security Information and Event Management. Consolidating security's relevant data from various sources to perform in-depth analysis, and to investigate threats and generate reports that meet compliance and standard regulatory schemes.  
Prerequisite: CIS 2103 or CID 2013 and CID 2053

**CVE 2001 - Applied Drafting and CAD: Civil (0-3-1)**

Develops skills to use CAD drafting as a means of communication in the civil and construction industry.

CVE 2013 - CAD tools in Civil Engineering (1-4-3)

Covers drafting fundamentals to advanced applications of CAD in a civil engineering environment. Introduces cutting-edge technology to create CAD drawings for multiple aspects of the civil engineering construction industry. Manage multiple drawing files in a digital environment.

Prerequisite: CVE 2001

**CVE 2103 - Site Surveying (2-2-3)**

Introduces modern surveying tools and methods used in civil engineering applications related to buildings, highways, utilities and any construction activity in the built environment. Covers the use of cutting-edge, state-of-the-art surveying equipment to perform a variety of surveying activities. Includes production of field notes, drawings, plots and calculations to meet industry standards.

Prerequisite: MTH 1103

**CVE 2113 - Quantity Surveying and Estimating (2-2-3)**

Examines project cost measurement and monitoring relative to the client, the consultant, and the contractor. Emphasis is placed on the roles of the quantity surveyor and estimator with respect to estimation and measurement at all stages throughout the project. The course also examines the various constraints placed on the project to conform to the client's planned project expenditure, and the role of the contractor's project management team in estimating, monitoring and controlling costs, from the tender phase to completion.

Prerequisite: CVE 2103

**CVE 2203 - Engineering Mechanics (3-1-3)**

Covers the concepts of equilibrium to determine the forces acting on static engineering structures such as beams, columns, trusses and cantilevers. Illustrate these forces graphically. Introduces methods used to calculate key structural properties related to centroids and moments of inertia that are required for structural analysis and design.

Prerequisite: PHY 1103

**CVE 2213 - Strength of Materials (3-1-3)**

Explores fundamental engineering mechanics principles and practices to determine shear force and bending moments in structures. Assess the flexural behavior of structural members subjected to transverse loading. Apply key concepts in a hands-on, structures-related project.

Prerequisites: CVE 2203

**CVE 2303 - Soil Mechanics (2-2-3)**

Covers the origin and formation of rocks and soils and evaluate the basic physical properties of soils as a material for use in civil engineering applications. Studies the engineering properties of soils through a set of standard laboratory tests. Covers application of engineering principles in the analysis of the test results.

Prerequisite: CVE 2603

**CVE 2403 - Fluid Mechanics and Hydraulics (2-2-3)**

Introduces the basic concepts of fluid mechanics including fluid properties, hydrostatics, basic fluid flow, continuity and momentum equations, energy equations, laminar and turbulent flow and pressure losses. Includes practical work will reinforce the theory through a set of experiments in the fluid dynamics laboratory.

Prerequisite: PHY 1103

**CVE 2603 - Construction Materials (2-2-3)**

Examines properties of key construction materials including aggregates, Portland cement, concrete, asphalt, various metals, glass and wood. Prepare and perform tests using international standards on aggregate, concrete and asphalt samples in a hands-on environment in the civil engineering workshop and laboratories.

Prerequisite: PHY 1103

**CVE 2613 - Civil Engineering Construction (2-2-3)**

Explores topics related to civil engineering construction covering above ground and below ground projects. Reviews the common types of formwork, steel and precast concrete frames and causes of deterioration in concrete structures. Introduces local, regional and international building standards and practices.

Prerequisite: CVE 2603

**CVE 2903 - Sophomore Design Project (1-4-3)**

Learn the necessary tools and information to manage engineering projects and resources. It covers a range of principles and practices in initiating, planning, staffing, coordinating and completing a project within the triple constraint of schedule, budget, and performance. The course strives to strike a balance between the general knowledge of project management and available tools, such as Primavera, OpenProj, and Microsoft Project, to assist in managing real life projects.

Prerequisites: EGN 1133, LSS 1123, and CVE 2001

**CVE 3203 - Structural Analysis (2-2-3)**

Introduces principles of engineering mechanics and strength of materials to the analysis of determinate and indeterminate structures. Covers forces on beams, frames and arches, analyses of structures for deflection using regional and international codes.

Prerequisite: CVE 2213

**CVE 3303 - Highway Engineering (3-1-3)**

Extends the core knowledge and principles of surveying to the design and construction of highways. Covers regional and international geometric design parameters to highways for vertical and horizontal alignment, cross-sections, drawing preparation, drainage, and intersections at grade and interchanges. Emphasis is on design practices and construction procedures to achieve a highway with acceptable levels of performance in terms of safety, operation, economics and environmental concerns.

Prerequisite: CVE 2103

**CVE 3403 - Water Resources and Supply (3-1-3)**

Introduces hydrologic concepts, development of water supply sources, principals involved in the collection and transportation of water/wastewater/storm runoff, and distribution of water for municipal use. Covers water system management, principles of hydraulics and water cycle precipitation hydrology, design of water supply systems to international standards. Includes site visits to water supply engineering sites relevant to the development and growth of world-class, large cities.

Prerequisite: CVE 2403

**CVE 3503 - Foundation Engineering (2-2-3)**

Extends the core knowledge of soil mechanics to the analysis and design of geotechnical engineering systems. Covers shallow and deep foundations and their use in local, regional and international settings. Explores alternatives for retaining structures and related stability of soils in civil engineering applications such as excavations, road embankments and earth dams.

Prerequisite: CVE 2303

**CVE 3513 - Concrete Design I (2-2-3)**

Covers the properties and design principles of reinforced concrete structural elements. Introduces the Limit State Design Theory and applies the principles and skills gained in structural analysis to the design of reinforced concrete structural elements. The Euro/British Codes of Practice are the basic codes of reference for all the design and detailing work in this course. The course includes the properties of structural concrete and the influence of each of its constituents on the performance of the final product.

Prerequisite: CVE 3203

**CVE 4303 - Traffic Engineering (3-1-3)**

Examines the factors that influence the design, use and maintenance of roads with respect to traffic issues inclusive of local, international highway classifications and administration, traffic survey studies, economic and environmental considerations, driver, pedestrian and vehicle characteristics, roadway capacity, volume and flow characteristics, signalization of intersections, safety as well as modelling and computer simulation.

**CVE 4313 - Urban Transportation (3-1-3)**

Covers history of development of transportation infrastructure in the UAE, factors affecting regional planning and local planning of transportation projects. Reviews evaluation and prioritization methods employed in urban transportation planning. Introduces asset management of transportation related infrastructure and safety considerations in urban transportation planning. Integration of freight into transportation planning process. Covers relevance of sustainability in existing and future transportation related projects.

**CVE 4323 - Transportation Planning (3-1-3)**

Examines the processes involved in facilitating the planning for future transportation facilities. Covers factors to be considered in the planning of new transportation projects including traffic flow, safety, energy consumption, travel time, accessibility, socio-economic and environmental impacts. Introduces relevant sustainability and ethical issues.

Prerequisite: Senior Standing

**CVE 4333 - GIS Applications in Civil Engineering (2-2-3)**

Examines the basic concepts and types of Geographic Information Systems (GIS) used in civil engineering practice. Covers collection and data analyses methods, to perform selected spatial operations. Introduce the five main components and functions of a GIS while differentiating between vector and raster methods for data capture. Students will be introduced to various GIS applications in civil engineering using appropriate software.

Prerequisite: CVE 2103

**CVE 4343 - Bridge Engineering (3-1-3)**

Covers the design of new bridges and evaluation of existing bridges in accordance with current AASHTO specifications, and the procedures and requirements of bridge design and evaluation. Introduces the AASHTO code provisions used for bridge design through examples. Outline the history of bridge engineering. Explain methods and procedures for superstructure and substructure design and evaluation. Introduces bridge load rating methods. Outlines advanced methods and technologies for bridge condition assessment with case studies.

**CVE 4353 - Road Design and Construction (3-1-3)**

Explores pavement types and the factors that impact their design with emphasis on equipment, materials and practices associated with the construction of flexible and rigid pavements. Maintenance methods including evaluation and rehabilitation are addressed. Explore the environmental impacts of construction and maintenance topics to sustainability, ethics and quality issues.

Prerequisite: Senior Standing

**CVE 4403 - Waste Water Engineering (3-1-3)**

Covers the principles of hydraulics, water cycle and precipitation hydrology, design sewer systems to international standards. Includes site visits to relevant sites to fully comprehend the importance of waste water engineering to the development and growth of world-class, large cities like Abu Dhabi and Dubai.

Prerequisite: CVE 3403

**CVE 4413 - Environmental Engineering (3-1-3)**

Covers the application of the fundamental principles of science and engineering toward environmental engineering situations, recognizing it is as an interdisciplinary science. Analyze the naturally occurring environmental phenomena, industry and human induced compounds and micro-organisms, and the changes and imbalances that occur in the environment. Explore sustainability, ethics and quality of life issues.

Prerequisite: CVE 3403

**CVE 4423 - Solid Waste Management (3-1-3)**

Examines the different sources of solid waste management. Includes investigation of the important aspects of waste control legislation, waste reduction and waste recycling. Covers sustainability strategies to protect the local and global environment. Introduces local and international approaches to handling and disposal of hazardous waste, and quality assurance measures.

Prerequisite: CVE 3403

**CVE 4433 - Sustainability in Civil Engineering (3-1-3)**

Introduces the concept of sustainability, emphasizes current practices and standards and simply addresses new concerns and constraints of building and construction. This new holistic approach requires some new ways of thinking and the frameworks for this are discussed. Students will be given the tools needed to understand this, a review of current practices for improving performance across the civil and environmental fields. These include water planning and treatment, building design and construction, community design and construction and more.

**CVE 4443 - Coastal Engineering (3-1-3)**

Covers modern technology for civil engineering projects in a marine environment. The significant development along the shores of the UAE including the creation of coastline provide the backdrop for the course. Coastal climates, tides, waves and environmental issues are addressed. Construction techniques and structures including piles, break-walls, piers and off-shore facilities are part of the course. Computer modelling and relevant site visits round out the students learning experience.

**CVE 4453 - Environmental Regulatory Compliance and Public Policy (3-1-3)**

Examines major environmental laws and the environmental impact assessment and permitting process. Key federal environmental statutes will be covered as well as the responsibilities of key regulatory agencies involved in environmental compliance. Local regulatory environment will be compared to global ones. In addition, the course emphasizes how to use critical thinking skills to analyze consequences of a planned action and determine impacts of changes in the environment, as compared with knowing the specifics of a particular regulation.

Prerequisite: CVE 4413

**CVE 4463 - Green Buildings (3-1-3)**

Covers depletion of the earth's natural resources, soaring energy costs, pollution of vital water and food sources, irreversible environmental degradation and climate change are serious challenges facing the human civilization. Introduces engineering principles to develop innovative strategies to positively influence the human life, the environment, and productivity of engineering infrastructure. Includes green structures design and construction principles, design various components of green buildings and evaluate the building performance according to LEED standards.

Prerequisite: CVE 4413"

**CVE 4503 - Steel Design (2-2-3)**

Examines wind loads on portal frames. Given a floor-framing plan, analyse and design a simple beam with its compression flange fully restrained/unrestrained laterally. Design tension and compression members in roof trusses. Design columns subjected to pure compression and combined flexural and axial forces. Design welded and bolted connections and a base plate connection. Analyse and design a one-bay/two-bay braced and moment frames for gravity and lateral loads using software.

Prerequisite: CVE 3203

**CVE 4513 - Concrete Design II (3-1-3)**

Covers typical design procedures, construction methods and detailing of reinforced concrete elements and structures as a whole. Provides an overview of basic design procedures and detailing of footings, pile foundations, walls, shear walls, columns, beams, and slabs for reinforced concrete buildings.

Prerequisite: CVE 3513

**CVE 4523 - Steel Design II (3-1-3)**

Covers design of connections for structural elements like a beam splice, column splice and connections for moment and braced frames, analyses and design of continuous beam of four spans with its compression flange fully restrained laterally, and design of members subjected to combined flexural and axial forces. Provides case studies on analyses and design two story, three bay, braced and moment frames for gravity and lateral loads, and complete design of small industrial building for gravity and lateral loads. Explores the design parameters of steel bridges.

Prerequisite: CVE 4503

**CVE 4533 - Prestressed Concrete Design (3-1-3)**

Covers the basic principles of pre-stressed concrete design and builds this to an ability to calculate, design and detail simple precast elements such as beams and slabs. The student will be able to complete both strength and serviceability checks and make appropriate allowances for fabrication and construction issues such as jacking techniques and joint details.

Prerequisite: CVE 3513

**CVE 4603 - Construction Contract Management (3-1-3)**

Applies the principles and procedures involved in effective administration and management of engineering contracts, from tender to final completion. Explores the legal implications of contract documents; major issues in pricing and bidding; preparation of tenders and work breakdown for bidding; reading tender documents and estimating the cost of work; initiating, negotiating and signing agreements; coordinating with General Services as per UAE procedures.

Prerequisite: CVE 2113

**CVE 4613 - Concrete Technology (2-2-3)**

Examines concrete-related topics, the quality assurance and quality control of Portland cement concrete, Portland cement characteristics and related tests, testing of fresh and hardened PCC, formwork, placement and curing of PCC, and reinforcement used in PCC elements. Explore concrete testing using local and international standards.

Prerequisite: CVE 3513

**CVE 4803 - Special Topics in Civil Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses.

CVE 4893 - Directed Study (3-1-3)

Provides an opportunity to investigate under faculty supervision beyond what is offered in existing courses.

**CVE 4902 - Capstone Design Project I (1-2-2)**

Capstone final year design project requires the formation of a team to propose, plan and design an engineering product. The student team is totally responsible for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisite: EGN 3012

**CVE 4912 - Capstone Design Project II (1-3-2)**

Continuation of the capstone final year design project consisting of the implementation, evaluation, and analysis of an engineering design project carried forward from the previous semester. Though guided by faculty, the student team is primarily responsible for the completion of the project milestones and course objectives. The course requires the integration and application of technological, organizational, communication, and interpersonal skills by the student team. Accurate analysis, implementation, documentation, and presentation skills form the basis for assessment.

Prerequisite: CVE 4902

**ECE 2003 - Teaching Mathematics in the Early Years: Skills and Concept Acquisition (3-1-3)**

Develop early mathematical skills and concepts collectively known as problem solving, reasoning and numeracy, subdivided into the areas of numbers as labels and for counting, calculating and shape, space and measures. Identify contemporary thinking about pedagogy and current practice in mathematics teaching in early childhood settings with a particular emphasis on the provision of developmentally appropriate, play-based learning experiences.

Prerequisite: EDU 1802 or EDU 1803"

**ECE 2203 - Learning through the Visual Arts (3-1-3)**

Identify recent thinking about creativity, and its promotion through visual arts based on UKEYFS and Reggio Emilia to affirm child-centredness. Develop skills, techniques and reflection by examining effective interventions to promote creativity and enable children to express knowledge, thoughts and feelings. Recognise opportunities to understand own creativity. Assist young children to comprehend their visual world.

**ECE 2503 - Theories of Teaching and Learning that impact the Preschool Curriculum (3-1-3)**

Identify key philosophies and theories in early childhood education. For example: Froebel, Montessori, Dewey, Steiner Waldorf and Reggio Emilia. Discuss the impact of these on the different curricula in early childhood education. Revisit Piaget, Bruner and Vygotsky, and then critique the preschool curriculum of the UAE."

**ECE 2603 - Learning through the Performing Arts (3-1-3)**

Identifies the importance of performing arts in the early childhood curriculum such as (drama/role play, dance, music, and movement). Students are able to explore and implement a range of the UAE methodologies in early childhood along with being expose to other international curriculums.

Prerequisite: ECE 2203"

**ECE 3003 - Literacies in Early Childhood (3-1-3)**

Identify a range of current approaches that facilitate the development of language and literacy skills including what are currently termed the new literacies, digital literacies or multi-literacies including digital text, images, hyperlinks and their arrangement on the page (Lankshear and Knobel, 2003). Identify processes by which children interact with a range of multiple sign systems that represent meaning in soft texts.

**ECE 3203 - Learning through Literature (3-1-3)**

Examine how books, poems and a range of other texts can be used to develop learning across domains with a particular emphasis on early childhood literacy. Examine 4 aspects: the historical and contemporary influence of popular culture on the development of early childhood literacy practices; the role of literature to support learning across domains; selecting and exploiting appropriate texts/genres for young learners (with reference to UAE and cross culturally relevant content); and establishing print/literacy-rich environments with a range of texts for various purposes.

**ECE 3503 - Planning and Assessment in Early Childhood Education (3-1-3)**

Review the factors, including developmental levels, individual learning needs and programme aims, that need to be considered in planning for learning across both domains (cognitive, physical, social and emotional) and curriculum areas. Define the terms 'curriculum', (for example the UK EYFS), and 'syllabus', (for example the seven developmental areas), examining the relationship between the two.

**ECE 3703 - Building Learning Communities in Early Childhood Education (3-1-3)**

Recognise family as the child's first teacher, foundation, and framework for the transmission of culture, language, attitudes and values. Analyse the stages of the family life cycle, interpersonal relationships within and outside the family and also identify the impact of context and culture on the family's ability to function effectively as an institution.

**ECO 1003 - Microeconomics (3-1-3)**

The fundamentals of microeconomics is examined with an emphasis on the supply and demand model and determinants of equilibrium in a market economy. Furthermore, it provides a framework to analyze consumer behavior and consumer decisions, as well as a firm's decision about optimal production and the impact of different market structures on the firms' behavior. In addition, it explores the use of microeconomic theory tools to analyze policy questions relevant to the operation of real economy."

**ECO 1103 - Macroeconomics (3-1-3)**

Introduces the basic concepts and tools of macroeconomic analysis. Demonstrates the measurement of key concerns in macroeconomics: GDP; unemployment; and the price level. Provides analytical models for exploring economic performance and long run growth. Analyses the nature of business cycles and fiscal and monetary policies

Prerequisite: ECO 1003

**EDU 1003 - Introduction to Theories of Learning 1a (3-1-3)**

Examine the development of children from birth to adulthood by investigating the domains of cognitive, linguistic, physical, social, emotional and moral development. Explore theories of child development to gain an initial understanding of the significant influence of these approaches on teaching and learning.

**EDU 1303 - Learning Technologies for the Classroom (3-1-3)**

Develop an introductory understanding of computer hardware, software, and web-based learning technologies that can be used in teaching and learning. Explore the fundamental elements of ICT for learning environments and its underlying pedagogy, educational issues relating to the use of technology in the classroom, the significance of technologies, their impact on society, and how society has changed as a result of them.

**EDU 1503 - Introduction to Theories of Learning 1b (3-1-3)**

Develop an understanding of the theoretical foundations of behaviorism and constructivism. Recognize the modern application of behaviorist and constructivist approaches to teaching and learning. Explore the development of language and identify key beliefs of three theories of first language acquisition: behaviorism, innatism, interactionism.

Prerequisites: EDU 1003 and FND M020

**EDU 1803 - Introduction to Math and Science in the Classroom (3-1-3)**

Students develop an understanding of how young children acquire and develop foundational concepts/skills of math and science through the process of inquiry and application of naturalistic, informal, adult-guided, and integrated learning experiences at the KG/FS level. They focus on explaining, relating, and assessing foundational early math skills and concepts, and science process skills. Finally, connections are made between foundation concepts, learning theory/theorists studied in 1503, and the development of more complex concepts/skills.

**EDU 2303 - Language and Development: SLA Principles and Pedagogy (3-1-3)**

Obtain an overview of key theories of children's acquisition of English (FLA) and consider the contrast with how Second Language Acquisition occurs. Explore the nature of learner language, and variability and gain important practical insights for teaching and learner language development from learner errors.

**EDU 2803 - Teaching Learners with Special Needs (3-1-3)**

Develop a basic understanding of the current philosophies, structure, levels of support, methodologies and assistive technologies required to educate students with special needs in different learning environments. Students explore a variety of case studies to expand their understanding of SEN and challenge their assumptions whilst researching local approaches to special needs.

**EDU 3003 - Global Education and Leadership (3-1-3)**

Learn about the concepts, values, skills, qualities and understanding about leaders and leadership. Develop the analytical, inspirational, persuasive, metacognitive, and critical and creative thinking skills required in an ethical leader as well as practice applying these skills in simulations and team-based practical activities that support reflection and self-discovery.

**EDU 3033 - English for Academic Purposes (3-1-3)**

Focus on the development of academic reading, writing, listening and speaking skills. Examine and interpret a broad range of articles, reports, and academic texts, as well as demonstrate understanding of extended speech on a range of general topics at natural speeds. Create short reports and expository texts such as discussion essays, and demonstrate an ability to take an active part in discussions, while demonstrating a solid understanding of grammar and an ability to understand the multiple meanings of a broad range of words in specific contexts.

**EDU 4003 - Research Methods and Reflective Practice in Education (3-1-3)**

Explore fundamental reflective practice informed by action research principles. Apply this knowledge to the creation of an authentic preliminary investigation into a researchable issue, culminating in an action plan that will be implemented in the following semester as part of a complete reflective practice project. Examine various elements of reflective practice with a focus on qualitative action research methodology.

**EDU 4203 - Curriculum Design (3-1-3)**

Examines the principles and dynamic nature of curriculum through an investigation of definitions of curriculum, evaluation of curriculum and learning outcomes, and differences between syllabus and curriculum. From this examination students evaluate curriculums and design a syllabus to match their learning contexts.

**EDU 4503 - Research Project (3-1-3)**

Develop a sophisticated understanding of action research. Implement the reflective action plan developed in the previous semester based on action research principles, culminating in a reflective action research report.

Prerequisite: EDU 4003

**EEC 2073 - Electrical Engineering Fundamentals (2-2-3)**

Fundamental concepts of electrical engineering include identifying basic electrical quantities and common scales relative to current, voltage, resistance and power. The construction, value and voltage-current characteristics of common passive components are described and Ohm's law is investigated by using laboratory equipment to measure voltage, current, and power of series, parallel, and series-parallel DC circuits. Kirchhoff's voltage and current laws are used to analyse DC circuits and AC signals are generated in the laboratory and measured in RC, RL, and RLC circuits, with a focus on amplitude and phase. The construction and operation of semiconductors are described.

Prerequisite: PHY 1203

**EGN 1103 - Engineering Measurements and CAD Introduction (0-4-3)**

Identify and implement workshop health, safety and accident prevention procedures and practices. Measure mechanical and electrical quantities with consideration of measurement accuracy, resolution, significant digits, and tolerance. Identify and implement common methods of fastening and joining engineering materials to build a device. Apply drafting and CAD basics to prepare basic drawings of engineering components and relevant engineering applications.

**EGN 1133 - Design Thinking in Technology (1-4-3)**

Covers the design thinking methodology to identify and address engineering problems. Includes solid modeling, rapid prototyping, understanding end users, their unarticulated needs, and creating alternative solutions. Focus on creativity, identify potential solutions, and innovation of new products and work processes. Students will apply design methodologies and innovation tools in an engineering technology problem, build and test it to gain the spirit and initiative of the course.

**EGN 2101 - Computer Aided Drafting (0-2-1)**

Introduces principles of CAD and free hand for drafting two and three dimensional multi-view and sectional representations of geometric shapes.

Prerequisite: EGN 1133

**EGN 2233 - Engineering Mechanic Fundamentals (3-1-3)**

Introduces principles of force systems, stresses, fluids, thermal systems, and motion and power transmission.

Prerequisite: PHY 1103

**EGN 2712 - Applied Programming for Engineers (1-2-2)**

Use algorithms, pseudocode, and flowcharts in the design process of computer programs. High level programming languages consist of primitive data types, operators, flow control, looping structures, error handling, functions, and array data structures, which may be used in the implementation of properly documented programs for engineering technology solutions.

Prerequisite: ICT 2013

**EGN 2806 - Work Placement I (0-40-6)**

Engage in practical work experience in an environment that develops skills and knowledge. Experience the activities in aviation maintenance, design industry, related aviation industry such as supply and logistics, test and calibration. This initial work placement may be in other engineering fields. Document journal entries explaining placement objectives and critique of the participant attitude, behavior and accomplishment.

**EGN 3012 - Project Management (2-1-2)**

Introduces the necessary tools and information to manage engineering projects and resources. Covers a range of principles and practices in initiating, planning, staffing, coordinating and completing a project within the triple constraint of schedule, budget, and performance. Examines topics such as work breakdown structure, estimating, project networks, risk management, resource allocation, cost planning and makes use of available industry tools, such as Microsoft Project, to assist in managing real life projects.

**EGN 3103 - Project Management (3-1-3)**

Describe the project management life cycle and discuss stakeholder impact. Develop a project work breakdown structure, define and identify major activities in each project phase, and describe team member roles, responsibilities, and authority. Schedule multiple projects, minimise resource conflicts and use a scheduling software tool to manage projects individually and together. Develop a resource plan with effective cost estimate, budgeting, control, and reporting. Assess and plan for project risk mitigation and auditing. Discuss resource allocation and apply to an engineering project.

**EGN 3203 - Engineering Economics (3-1-3)**

Apply the basics of economic analysis for quantifying engineering business decisions. Recognise the importance of: the time value of money; analysis of single and multiple investments; comparison of alternatives; capital recovery and tax implications. Advanced analysis of certainty; uncertainty; risk analysis; public sector analysis and break-even concepts related to engineering projects. Demonstrate competency in key economic analysis using hands-on tools like case studies.

**EGN 3212 - Economics for Engineering (2-1-2)**

Covers basics of economic analysis for quantifying engineering business decisions. Includes time value of money; analysis of single and multiple investments; comparison of alternatives; capital recovery and tax implications. Advanced analysis of certainty; uncertainty; risk analysis; public sector analysis and break-even concepts related to engineering projects. Demonstrate competency in key economic analysis using hands-on tools like case studies.

**EGN 3333 - Health Safety and Environment (3-1-3)**

Understand and describe common industrial procedures for employee health, safety and environment. The course covers the identification and control of hazards, occupational health, fire protection and prevention, safety management and ethics, safety regulations, safety inspection, accident investigation, personal protective equipment, and safety report documentation. Discuss environment protection, accident prevention, effective committee operations, accident investigation, and safety training.

Prerequisite: EGN 1103 OR EGN 1133

**EGN 3806 - Work Placement II (0-40-6)**

Gain relevant engineering experience in an actual working environment to provide an opportunity to develop and apply professional work ethics and practices. Transfer of engineering skills learned at college to the workplace is a major feature of this course.

Prerequisite: EGN 2806

**EGN 4333 - Renewable Energy Systems (3-1-3)**

Covers renewable energy sources and systems for conversion of various forms of energy into electrical power are essential for sustainable systems. Includes common energy sources such as wind, solar, nuclear, fuel cell, hydro, biomass and geothermal are described by operational principles, block diagrams and construction. Introduces factors affecting generation, efficiency and integration of power sources to the grid from wind and solar-based energy systems.

Prerequisite: PHY 1203

**ELE 2114 - Electrical Circuits (3-2-4)**

Covers DC and AC fundamentals, which include Ohm's law, power dissipation, Kirchhoff's laws, and linear circuit theorems, such as Thevenin equivalence, Norton equivalence, and superposition. Introduces analysis of networks of series, parallel, and series-parallel linear circuits with various sources. Describes fundamental energy storage components. Explore transient and steady state responses and power dissipation of RC, RL, and RLC linear reactive circuits with a sinusoidal source.

Prerequisite: PHY 1203

Corequisite: ELE 2181

**ELE 2153 - Electrical Engineering Fundamentals (3-1-3)**

Fundamental concepts of electrical engineering include identifying basic electrical quantities and common scales relative to current, voltage, resistance and power. The construction, value and voltage-current characteristics of common passive components are described and Ohm's law is investigated by using laboratory equipment to measure voltage, current, power of series, parallel, series-parallel DC circuits.

Prerequisite: PHY 1203

**ELE 2181 - Circuit Lab (0-2-1)**

Practical part of DC and AC fundamentals, which include Ohm's law, power dissipation, Kirchhoff's laws, and linear circuit theorems, such as Thevenin equivalence, Norton equivalence, and superposition that are applied to linear circuits. Network analyses of series, parallel, and series-parallel linear circuits with various sources and the description of fundamental energy storage components are included. The transient and steady state analyses are determined for RC, RL, and RLC linear reactive circuits with a sinusoidal source.

Prerequisite: PHY 1203

Corequisite: ELE 2114

**ELE 2213 - Digital Circuits (2-2-3)**

Fundamental concepts of digital systems are introduced, which include numbering systems, digital codes, logic symbols, and Boolean expressions. Students learn to apply logic minimization techniques to the analysis of combinational and sequential circuits. The classification of integrated circuit (IC) families is also presented.

Prerequisite: PHY 1203

**ELE 2303 - Power Generation and Transmission (3-1-3)**

Covers the layout, main components, and characteristics of common electrical power generation plants with application to various thermal power plants and the power transmission process from generation to distribution. Develop expressions for resistance, inductance and capacitance of high-voltage power transmission lines which are used to determine the equivalent circuit of a three-phase transmission line.

Prerequisite: ELE 2114

**ELE 2314 - Principles of Machines and Power (3-2-4)**

Explores the fundamentals of common electrical machines through industrial applications. Covers analysis of three-phase electrical circuits, operation of single-phase and three-phase electrical transformers and the steady state operation of DC machines and stepper motors. Includes the performance characteristics of single and three-phase induction motors and concepts are reinforced using practical experiments in a laboratory setting.

Prerequisite: ELE 2114

**ELE 2403 - Electronics I (2-2-3)**

Examine the construction and operation of a semiconductor diode. Explore the use of diodes in common practical applications. Analyse the construction, operation, characteristics, and common applications of semiconductors including BJTs, JFETs, MOSFETs, and IGBTs. Theoretical concepts are reinforced using both circuit simulation and practical experiments in a laboratory setting.

Prerequisite: ELE 2114

**ELE 2573 - Electric Circuit Design and PCB Manufacturing (2-2-3)**

Explores the process of circuit design from circuit schematic, through simulation and PCB design to PCB fabrication. Building on the theoretical background of circuit design provided in other courses, students learn to use CAD tools to capture a schematic, run a simulation, design a PCB and fabricate a PCB.

Prerequisite: ELE 2403

**ELE 2603 - Instrumentation and Control (2-2-3)**

Explores open and closed loop control systems with a focus on the role of transducers and actuators. Introduces set-points, feedback and error signals. Examine transducers and actuators to measure and control physical properties such as temperature, flow, pressure, position, level, rotation speed and torque. Includes various on/off and PID closed loop control systems which are analysed through simulation and practical laboratories.

Prerequisite: ELE 2114

**ELE 2613 - Industrial Automation (2-2-3)**

Explore the Programmable Logic Controller (PLC) structure in terms of hardware and software components. Develop industrial control solutions in the laboratory using PLC features including relays, timers and counters. Practice systematic fault finding and debugging techniques. Use a SCADA system to control and supervise PLCs a simple industrial automation system.

**ELE 2903 - Sophomore Design Project (1-2-3)**

Sophomore project requires the formation of a team to complete the design of an engineering product or system to solve a narrowly defined engineering technology problem. The team will analyze, design and select engineering components and materials and apply systematic design process techniques and implement them in a real life practical design setting. The team will apply simple data and decision analysis techniques necessary to design elements commonly found in electrical systems.

**ELE 3203 - Communication Systems (2-2-3)**

Explores the fundamental components of an analogue communication system using the block diagram. Includes analogue modulation and demodulation techniques used in transmitters and receivers, respectively, propagation characteristics of the transmission channel and circuit simulation and laboratories.

Prerequisite: ELE 2114

**ELE 3213 - Engineering Electromagnetics (3-1-3)**

Introduces the fundamentals of electromagnetics in both theory and application. Covers wave propagation, transmission lines, antenna theory, and antenna design are studied. Other topics include Maxwell's equations, plane wave propagation, reflection, refraction, diffraction, propagation losses, RF signal measurement, impedance matching, and Smith chart applications.

Prerequisite: ELE 2114"

**ELE 3323 - Electrical Machines (2-2-3)**

Explores the construction, operation and testing of three-phase electrical machines. Introduces physical concepts and basic laws in electromechanical energy conversion to learn how changing magnetic fields can be used to produce torque in rotating machines. Covers models of electrical machines to explore the principles underlying the performance of three-phase electrical machines.

Prerequisite: ELE 2314

**ELE 3413 - Electronics II (2-2-3)**

Explores the analysis and design of amplifier circuits in the context of various electronic applications, amplifier parameters such as frequency response, noise performance and impedance. Examines the properties of power amplifiers and circuit simulation and practical laboratories are utilized to reinforce concepts.

Prerequisite: ELE 2403

**ELE 3613 - Signals and Systems (2-2-3)**

Covers time and frequency domain representation of fundamental, continuous and discrete time signals and systems. Explores fundamental signals and operations, system properties and the representation of linear time-invariant systems. Includes tools for analysis of systems such as continuous-time Fourier analysis, Laplace transform analysis, discrete-time Fourier analysis and Z transforms. Use of CAD tools to simulate, implement, and analyse signals and systems.

Prerequisite: MTH 2503

**ELE 3614 - Microcontroller Systems (3-3-4)**

Covers the operation and implementation of microcontrollers in practical applications. Explore the software and hardware aspects microcontroller architecture. Common input and output modules are utilised in typical applications in a laboratory setting. Learn program development from flowcharts through to assembly language using a top down and modular approach. Explores the input/output modules available in modern microcontrollers, such as timers, serial interfaces, D/A and A/D converters in a laboratory setting.

Prerequisites: ELE 2213 and EGN 2712

**ELE 4213 - Digital Communication (3-1-3)**

Covers the fundamental principles of digital communication systems. Explores digital transmission, use of available bandwidth, line coding, PCM, delta modulation techniques, transmission modes, digital modulation techniques, multiplexing, error detection and correction coding techniques, and transmission media. Satellite and fibre optic communication systems are presented as practical applications. Circuit simulation and laboratories are utilized to reinforce concepts.

Prerequisite: ELE 3203

**ELE 4223 - Data Communication and Network (3-1-3)**

Introduces the fields of networks and network protocols and examine Local Area Networks (LANs), Wireless LANs (WLANs), the OSI model, elements of the Internet network and network security. Explores aspects of the OSI and internet protocols focusing on the Network, Transport and Application layers including logical or IP addressing, delivery, forwarding, routing of IP packets and network security.

Prerequisite: ELE 3203

**ELE 4233 - Mobile Communications (3-1-3)**

Examines mobile cellular communication through discussion of key concepts such as: architecture; cell design; frequency reuse; handoff; interference and capacity; and grade of service (GoS). Explores propagation radio channel, digital modulation and its performance over fading channels, and multiple access schemes such as TDMA, FDMA, CDMA and spread spectrum systems. Examines wireless standards and future development.

Prerequisite: ELE 3203

**ELE 4243 - Satellite Communications (3-1-3)**

Explores concepts used in a satellite communication system, calculation of basic parameters in a satellite communication system, and aspects of satellite communication like orbital mechanics, launching techniques, satellite link design, earth station technology and different access system towards a satellite.

Prerequisite: ELE 3203

**ELE 4253 - Tetra Communications (3-1-3)**

Covers aspects of a Terrestrial Trunked Radio (TETRA) system including trunking principles, service aspects, network planning and architecture. Examines technical aspects of the TETRA radio interface such as: Public Digital Mobile Radio Systems Environment; The Private Mobile Radio Environment; TETRA System Architecture; Components and Services; and TETRA layers and Protocols.

Prerequisite: ELE 3203

**ELE 4333 - Electrical Power Distribution (2-2-3)**

Covers the fundamentals of electrical power distribution, common distribution system layouts, including the function of substations and transmission equipment. Explores the factors affecting design calculations such as voltage regulation, power factor, power quality and tariff calculation. Covers the procedures and protection methods for power distribution systems and consumer installations.

Prerequisite: ELE 2303

**ELE 4343 - Power System Analysis (3-1-3)**

Explores methods for the analysis of power systems including complex power calculations, per-unit system of analysis and electrical network calculations. System modelling, load flow analysis, symmetrical components theory, fault analysis and stability problems are also examined. Methods are applied in a laboratory setting and reinforced using simulation and analysis tools.

Prerequisites: ELE 2303 and ELE 3323

**ELE 4353 - System Protection and Coordination (3-1-3)**

Examines power system protection fundamentals, basic design requirements, and principles of operation for over-current, over-voltage, and under-voltage protection schemes for various power system components. 3 phase short circuit currents are analysed under various conditions and are used as a basis to select circuit breaker types and ratings. Various protective devices, such as over current and earth leakage, differential, distance, over voltage, and under voltage relays, are applied as appropriate. Unit protection, back up protection, and protection coordination are introduced.

Prerequisite: ELE 2314

**ELE 4363 - Power Electronics (3-1-3)**

Examines the control, protection and commutation of power switching devices including the diode, thyristor, MOSFET, and IGBT. Power systems such as: AC to DC converters; controlled rectifiers; AC to AC converters; single phase and three phase AC voltage controllers; cycloconverters; choppers for DC to DC power conversion; inverters; and square-wave inverters are explored. Students learn single phase and three phase pulse width modulation (PWM) techniques.

Prerequisite: ELE 2403

**ELE 4373 - Electric Drives (3-1-3)**

Covers the theory and control methods for DC and AC electrical drive systems in laboratory settings. Includes methods for controlling DC and AC motors and mathematical models to implement linear control techniques. Introduces CAD tools to model and simulate various implementations and designs with the associated control mechanisms to investigate and test the overall DC and AC drive system performance under various operating conditions.

Prerequisites: ELE 4363 and ELE 3323

**ELE 4383 - Electrical Maintenance Operation (3-1-3)**

Examines preventive, corrective and opportunistic maintenance and testing of electrical equipment and subsystems including substations, circuit breakers, power transformers, and industrial machines. Utilize Electrical Preventive Maintenance and Test (EPMT) program with consideration of electrical safety, switching practices and precautions taken with live circuits. Explore maintenance options with respect to economic considerations and cost benefit analysis.

Prerequisites: ELE 3323, ELE 2303 and ELE 2314

**ELE 4393 - Machine Control and Drives (3-1-3)**

Explore the design and control strategies for motor drive systems in industrial settings from the point of view of fundamental physical, electrical and mechanical properties of DC and AC motors. Apply the relative merits of various AC inverter circuits for reliable and efficient operation of AC drives to a range of industrial applications. Use mathematical modelling and software analysis extensively.

Prerequisites: ELE 2403 and ELE 3323

**ELE 4423 - Embedded System Design (3-1-3)**

Examine the specification, design, development, and testing of real-time embedded microcontroller systems. Present various architectures, real-time programming, and interface of common peripheral devices. Apply skills and techniques in a laboratory setting.

Prerequisite: ELE 3614

**ELE 4433 - VLSI Design (3-1-3)**

Introduces the design, simulation, and fabrication of CMOS very large scale integration digital circuits through basic digital circuits. Explore VLSI technology scaling at both the transistor and interconnects levels, calculation of time delay and power dissipation through simulation of combinational and sequential digital circuits such as full adders, n-bit adders, Latches and Flip-Flops. Includes array and Booth multipliers, SRAM and DRAM memory, reliability and radiation hardening.

Prerequisite: ELE 2213

**ELE 4443 - Advanced Microprocessors (3-1-3)**

Examine modern microprocessor architecture which is contrasted with classical architecture. Explore RISC and CISC processors, pipelining and superscalar processors, interfacing techniques including polling, interrupt driven I/O and DMA based I/O. Develop I/O handler programmes for a modern microprocessor system.

Prerequisite: ELE 3614

**ELE 4613 - Programmable Devices (3-1-3)**

Explores the use of programmable logic devices (PLDs) and field-programmable gate arrays (FPGAs) to implement combinational and sequential logic circuits. Trade-offs in terms of advantages, cost, programming and reliability of device. Use FPGA hardware to design, develop, synthesise, implement, test, and debug FPGA design project in accordance with a provided specification.

Prerequisite: ELE 2114

**ELE 4623 - Control Systems (2-2-3)**

Use modelling and simulation to analyse, augment, and improve the performance of analogue single-input single-output LTI control systems for a variety of applications. Typical control systems are modelled by a transfer function and various frequency response methods are used to determine and assess the system response and stability. Use MATLAB/Simulink in the design and analysis of various compensators. Examine basic digital control systems and related properties.

Prerequisite: ELE 3613

**ELE 4633 - Digital Control Systems (2-2-3)**

Explores topics related to digital control systems including the components of computer control systems, design and analysis of digital controllers, typical industrial applications and distributed control system architecture. Examines the realization of digital control systems, distributed control systems. Develop a practical implementation of a simple distributed control system.

Prerequisite: ELE 3613

**ELE 4643 - Intelligent Systems (3-1-3)**

Explore Artificial intelligence (AI) and related system techniques and implement in various applications. Examine basic AI topics of knowledge representation, search techniques, and reasoning. Develop concepts and methods used in fuzzy sets and systems using fuzzy practical applications. Explore and implement the biological origins of artificial neural networks and genetic algorithms in practical applications.

**ELE 4653 - Digital Signal Processing (3-1-3)**

Covers understanding of the fundamentals of digital signal processing through analysis of the time, amplitude, and frequency effects of sampling and digitizing continuous-time signals. Use the Z-transform and signal flow diagrams in the design of various FIR and IIR filter specifications. MATLAB is used to implement and analyse the frequency response. Circuit simulation is utilized to reinforce concepts.

Prerequisite: ELE 3613

**ELE 4663 - Robotics Technology (3-1-3)**

Examines mechanical components, transducers, and actuators of a computer automated process. Use a hands-on approach to explore robotic embedded systems, associated programming, dedicated controllers, and related applications. The fundamental concepts are learned, describing robotics operation including coordinate transformations, sensor and actuator selection and interface, motion analysis, path planning and kinematics.

Prerequisite: ELE 2213

**ELE 4673 - Advanced Control Systems (3-1-3)**

Covers a solid background for the understanding of modern control system concepts, analysis and design techniques, and hardware and software packages. Review of classical control systems is followed by an introduction to advanced classical control methods such as state space representation of continuous-time system, continuous-time response and performance specifications, state space analysis and design. A project based on problems drawn from industrial applications is incorporated in the key design activities.

Corequisite: ELE 4623

**ELE 4863 - Special Topics in Electrical Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses.

**ELE 4893 - Directed Study (3-1-3)**

Provides an opportunity to investigate under faculty supervision beyond what is offered in existing courses.

**ELE 4902 - Capstone Design Project I (1-3-2)**

Student teams are formed to propose, plan, and design an electrical engineering project. The student team is solely responsible for the completion of the project milestones and related outcomes while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**ELE 4912 - Capstone Design Project II (1-3-2)**

The engineering design project is carried forward from the previous semester with student teams moving to the implementation, evaluation, and analysis of the project. Though guided by faculty, the student team is primarily responsible for the completion of the project milestones and course objectives. The course requires the integration and application of technological, organizational, communication, and interpersonal skills by the student team. Accurate analysis, implementation, documentation, and presentation skills form the basis for assessment.

Prerequisite: ELE 4902

**ELT 2003 - Language Arts A (Speaking, Listening and Vocabulary) (3-1-3)**

Explore and build on the knowledge and awareness of how language impacts learning and how young children acquire and learn in a second or additional language. Apply significant international models of learning and teaching while examining approaches to the teaching of Speaking and Listening to EFL learners during teaching practice.

**ELT 2203 - Language Arts B (Teaching Methods for the Primary School Teacher A) (3-1-3)**

Explore appropriate methods and strategies for the effective, integrated delivery of Language Arts in a primary classroom. Identify and evaluate a variety of international models for teaching the principles, concepts and skills of English. Consider the implications for integrated content delivery in schools. Explore how to select an appropriate method suitable for the particular aspect of language being taught.

**ELT 2503 - Language Arts C (Reading/Writing/Literature) (3-1-3)**

Develop an appreciation of children's literature and its fundamental role in promoting literacy in primary schools. Develop an understanding of the basic structure of a story and the basic literary genres, and examine their appropriateness for the UAE context. Explore how to develop the ability to deliver fluent and engaging story time sessions.

**ELT 2603 - Language Arts D (Teaching Methods for the Primary School Teacher) (3-1-3)**

Explore appropriate methods and strategies for effective, integrated delivery of Language Arts i.e. teaching of reading in an English medium primary classroom. Identify and evaluate a variety of international models for teaching the principles, concepts and skills of English. Consider the implications for integrated content delivery in schools.

**ELT 3003 - Child and Adolescent Literature (3-1-3)**

Develop student's awareness of the value of adolescent literature as a tool in language teaching. Explore theoretical foundations for the use of literature in the classroom. Develop a bank of classroom applications for the teaching of English as a Second Language (ESL). Publish and share resources and materials.

**ELT 3203 - Language Arts E (Teaching Methods for the Secondary School English) (3-1-3)**

Develop a sophisticated understanding of the teaching of reading in UAE schools. Review and solidify understanding of the complex nature of reading. Deliver a staged reading lesson that prepares, monitors and extends the reader's comprehension through both top-down and bottom-up strategies. Demonstrate basic vocabulary teaching strategies and methods to assess reading comprehension.

Prerequisite: ELT 2603

**ELT 3503 - Literacy and Grammar in the Second Language Curriculum (3-1-3)**

Develop understanding and knowledge of the language as an essential tool for English language teachers. Raise awareness of English grammar and language used while teaching, and build on existing knowledge. Analyse grammatical functions and structures in terms of form and use and identifying potential second language learner problems.

**ELT 3703 - Language Arts F (Teaching Methods for the Secondary School English) (3-1-3)**

Explore and build on knowledge of literacy development by examining the teaching and learning of writing while considering how to plan for these in the second language curriculum. Examine the complex skills involved in writing, before moving on to analyse a range of approaches and strategies that can be used to teach writing in secondary schools.

EMA 2013 - Methods and Theory for Teaching Mathematics (3-1-3)

Students will define 21st Century mathematics linking it to underlying theories of teaching and learning and will identify and explain strategies used to plan, teach and assess primary mathematics effectively. They will link principles of teaching and proficiency to the relevant curriculum and context.

Prerequisite: EDU 1503

**EMA 3003 - Tools and Manipulatives for Primary Mathematics (3-1-3)**

Students will identify, differentiate between, and explore the uses of tools, resources and graphic organizers (GOs) related to primary math learning. They will explore relevant math curricula, linking content to the tools/resources/GOs. And, differentiate between exploratory and practice activities, noting the purpose/value of each in the development of mathematical proficiency. Then, develop clear sequenced instructions for the tools/resources/GOs such to focus on exploration of concepts and processes at the grades appropriate to the major.

**EMA 3013 - Inquiry Based Mathematics Teaching and Learning (3-1-3)**

Students will examine Inquiry-based Learning (IBL) as the foundation for the development of teaching, learning and understanding. Differentiate between the various levels of inquiry and explore appropriate models for developing Inquiry-based Learning experiences (E Models) and higher order thinking skills.

Prerequisite: EMA 2013

**EMA 3103 - Mathematics Concepts for the Primary School Teacher (3-1-3)**

Students will define differences in content topics and scope, noting key skills of a set of content units relevant to the target grade level(s). Focus will be on connecting/explaining math processes/skills and exploring methods to develop the key concepts/processes for the grade level(s).

Prerequisite: EMA 3003

**EMA 3113 - STEM Education for Mathematics Teachers (3-1-3)**

Students will examine and reflect on the value of STEM education/learning in connecting content to 21st Century and higher order thinking (HOT) skills. Students will relate relevant curriculum to STEM learning opportunities and plan an appropriately challenging STEM learning project.

Prerequisites: EMA 3003 and EMA 3013

Corequisite: EMA 3103

**EMC 2003 - Computer Aided Drafting (3-1-3)**

Understand the fundamentals of 2D and 3D computer aided drafting software for mechanical engineering applications. Apply drawing standards, design layout, drawing notes, dimensioning, drawing scales, tolerances, geometric modeling and assign these to an engineering drawing in AutoCAD. Create engineering drawings in orthographic, sectional and auxiliary views. Combine these new skills to produce assembly drawings and first/third angle projections.

Prerequisite: EGN 1103

**EMC 2013 - Materials Selection and Testing (3-1-3)**

Apply material selection criteria for specific engineering applications through the understanding and identification of materials, their mechanical properties and material defects. Explain atomic bonding, structure, imperfections, grain-size and re-crystallization and describe material failure and causes of corrosion with prevention methods.

**EMC 2023 - Statics and Dynamics (3-1-3)**

Understand the fundamentals of statics for particles and rigid bodies and the principles of dynamics with engineering applications. Use this understanding to analyse and solve problems in planar equilibrium, forces in structural members and problems in kinematics and kinetics for particles and rigid bodies.

Prerequisite: PHY 1103

**EMC 2033 - Manufacturing Technology (3-1-3)**

Develop an understanding in the processes and technologies relative to manufacturing technology. Distinguish between the different processing and assembly operations in manufacturing. Identify relevant design factors when selecting a manufacturing process and apply the methodology for a given component. Compare measurement systems, quality control of manufactured parts and technologies associated with Advanced Manufacturing Technology (AMT).

**EMC 2043 - Mechanics of Materials (3-1-3)**

Understand, analyse and determine stress, strain, deformation, strain energy and load carrying capacity of structural members subjected to tension, compression, shear, torsion, bending and stress-strain transformation. Interpret engineering design concepts that are integrated into the course and conduct and analyse related laboratory experiments.

Prerequisite: EMT 2003 or EMC 2023

**EMC 2053 - Fluid Mechanics (3-1-3)**

Explain fluid properties, pressure and its measurement for an incompressible fluid. Calculate hydrostatic forces and hydrodynamics through the understanding of buoyancy, forces on submerged surfaces, pipe flow and energy losses. Conduct and analyse practical work through a set of experiments in the hydraulics laboratory to reinforce the theory.

**EMC 3003 - Industrial Plant Maintenance (3-1-3)**

Understand and analyse methods of achieving good organisational and maintenance planning in industrial settings including benchmarking fundamentals, maintenance training, preventive maintenance, condition monitoring, maintenance inventory and purchasing and management reporting. Understand integration and benchmarking best practices in maintenance management and assess world-class maintenance management examples.

**EMC 3023 - Thermodynamics I (3-1-3)**

Understand the first law of thermodynamics using heat transfer mechanisms, forms of mechanical work and the balance of energy; and apply to non-flow processes (closed systems) and flow processes (open systems). Determine thermos-physical properties of pure substances and ideal gases. Apply the second law of thermodynamics for thermal cycles.

**ENT 2003 - New Venture Creation (3-1-3)**

Examines the broad range of challenges faced in creating a new business venture. It covers also issues related to new product, service introduction and new market creation. Identify sources of funding, structure and strategy of the venture are reviewed to develop a business plan.

**ENT 2103 - Business Negotiations (3-1-3)**

Focuses on the principles and practices in business negotiations. Topics covered include negotiating concepts, strategies, situational applications, and practice in applied techniques. Negotiation in sales, customer relations, global nuances in negotiation situations, employee management, and career development are explored.

Prerequisite: MGT 1003

**ENT 3023 - Small Business Management (3-1-3)**

Focuses on the management of small independently owned and operated businesses. It emphasizes analyzing new business opportunities which include planning and managing contemporary small businesses. In-depth understanding is achieved through field experiments in small businesses. In-depth understanding is achieved through field experiments in small businesses.

**ENT 3033 - Social Entrepreneurship (3-1-3)**

Focuses on developing self-sustaining, profitable new social ventures. Topics covered include: social entrepreneurship processes, organizing and managing the social entrepreneurial process, discovering opportunity, taking action for impact, funding and the intrapreneurship process. Topics covered include: social entrepreneurship processes, organizing and managing the social entrepreneurial process, discovering opportunity, taking action for impact, funding and the intrapreneurship process.

Prerequisite: ENT 2003

**ENT 3103 - Leadership for Entrepreneurs (3-1-3)**

Examines leadership theory and research with an emphasis on the development of leadership and interpersonal skills to be an effective leader in a variety of settings. Examines leadership theory and research with an emphasis on the development of leadership and interpersonal skills to be an effective leader in a variety of settings.

Prerequisite: MGT 2103

**ENT 3113 - Entrepreneurial Marketing (3-1-3)**

Focuses on entrepreneurial marketing and sales. It covers concept validation, developing a sales strategy, and value proposition and the business model. In addition, it covers the process of entrepreneurial marketing of products and services by examining concepts such as the marketing mix, consumerism, and market segmentation.

Prerequisite: MRK 1103

**ENT 4003 - Collaborative and Affordable Design for Entrepreneurs (3-1-3)**

Examines the use of focused innovative design for the provision of affordable products and services. Covers cultural aspects in design, as well as ethnographic issues as determinants of design appropriateness and affordability. The course also deals with cross-functional and collaborative entrepreneurship, and looks at how these may be used to help ensure stakeholder engagement, and the viability of entrepreneurial ventures.

Prerequisite: MGT 3103

**ENT 4013 - New Venture Growth Strategies (3-1-3)**

Focuses on the strategic aspects of growing fledgling ventures, as well as the prime strategic issues encountered by new business start-ups. The course looks at contemporary strategic frameworks and techniques for managing venture growth in a controlled and sustainable manner, in competitive business environments. A variety of venture growth case studies, scenarios and simulation exercises are utilized throughout the course to help teach key concepts and techniques.

Prerequisites: MGT 3103 and ENT 3023

**ENT 4033 - Raising Funds (3-1-3)**

Focuses on the various methods that may be used by companies to raise funds in order to transform their business ideas into functioning businesses, or for scaling up companies that already exist. The course looks at the role of venture capitalists, angel investors, accelerators and incubators in fund raising schemes. Strategies for effective fund-raising, as well as the structured business planning that underpins fund-raising are examined. New approaches such as Crowdfunding and the use of social media to raise funds are discussed.

Prerequisites: FIN 2003 and ENT 2003

**ENT 4103 - Managing Innovation (3-1-3)**

Examines how competent management of innovation may be used as a source of competitive advantage by organizations. Provides structured frameworks for assessing and enhancing levels of corporate innovation, and examines idea generation, conversion and diffusion phases of innovative processes. Organizational learning and culture, and their role in sustaining innovation, is discussed.

Prerequisite: ENT 4013

**ENT 4113 - Commercialization of Innovation (3-1-3)**

Focuses on the end-products of innovative processes and the related activities that may be commercialized for societal gain and financial profit. Discusses sustainable and competitively advantageous strategies that may be adopted to grow revenues from innovative activities. In addition it looks at methods for improving market share and enhancing brand image for products and services emanating from innovation.

Prerequisite: ENT 4003

**ENT 4133 - Managing Intrapreneurship and Organizational Change (3-1-3)**

Presents intrapreneurship as a business activity that may be used to provide differentiation and sustained competitive advantage. Covers the key attributes of intrapreneurship, and how organizational culture and structures may be developed to support this. The course looks at organizational change characteristics, linking these to intrapreneurship activities within the business. Structured frameworks and techniques are presented for characterizing and effectively managing organizational change.

Prerequisite: MGT 2103

**ENT 4203 - Innovation and Entrepreneurial Research Project (3-1-3)**

Demonstrating mastery of the program learning outcomes, this final semester capstone course requires the application of in-depth knowledge and research skills gained across the Innovation and Entrepreneurial Program to be evidenced in the industry-based project and report. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment.

**EPC 1403 - Practicum 1A (0-4-3)**

The practicum is central to the Bachelor of Applied Science in Education. In the 'Beginning Teaching' phase of the programme, students complete a 10-15 day practicum in a primary and/or kindergarten setting. During this placement they will observe, implement and reflect upon learning highlighted in the education and methodology strands of the programme. Students will document current practice and undertake a minimum of two, paired or individual teaching activities with small groups of students under the direct supervision of the MST."

**EPC 1903 - Practicum 1B (0-4-3)**

The central component of the education programme is the supervised teaching practicum. Continuing the 'Beginning Teaching' phase of the programme, student teachers complete a practicum over a 10-15 day period in a primary and/or kindergarten setting. Under the direct supervision of the MST, student teachers will apply strategies learned in corresponding courses to teach a minimum of three, paired or individual teaching activities to an entire class for part of a lesson. This should include one start, middle and ending.

Prerequisites: EPC 1403 or EPC 1401, and FND M020."

**EPC 2403 - Practicum 2a (0-4-3)**

In the first semester of the 'Emerging Teaching' phase of the programme, student teachers complete a practicum over a 12-18 day period during which coursework from corresponding courses will also be implemented. This takes place in a setting appropriate for their degree strand (ECE, EDT, EPR, ELT). Building on Practicum 1b and under the guidance of the MST, student teachers will plan, deliver and reflect upon the efficacy of a minimum of three, paired or individual complete teaching sessions with an entire class.

Prerequisite: EPC 1903 or EPC 1901"

**EPC 2903 - Practicum 2b (0-4-3)**

In the final semester of the 'Emerging Teaching' phase of the programme, student teachers complete a practicum over a 12-18 day period during which coursework from corresponding courses will also be implemented. This takes place in a setting appropriate for their degree strand (ECE, EDT, EPR, ELT). Building on Practicum 2a and under the guidance of the MST, student teachers will individually plan, deliver and reflect upon the efficacy of a minimum of three, complete teaching sessions with an entire class.

Prerequisite: EPC 2403 or EPC 2401"

**EPC 3403 - Practicum 3a (0-4-3)**

In the 'Sustained Teaching' phase of the programme, students complete a practicum of 15-20 days in which coursework from corresponding courses is also implemented in a setting appropriate to their degree strand (ECE, EDT, EPR, ELT). Building on Practicum 2b, with MST support, students will plan, deliver and reflect upon the efficacy of a minimum of seven, complete teaching sessions with an entire class. This includes 4 connected sessions in which students will apply formative assessment, personal reflection and critical feedback to inform future planning.

Prerequisite: EPC 2901 or EPC 2903"

**EPC 3903 - Practicum 3b (0-4-3)**

In the final 'Sustained Teaching' phase of the programme, students complete a practicum of 15-20 days in which coursework from corresponding courses is also implemented in a setting appropriate to the degree strand (ECE, EDT, EPR, ELT). Building on Practicum 3a, with MST support, students will plan, deliver and reflect upon the efficacy of a minimum of 10, complete teaching sessions with an entire class. This includes 4 connected sessions in which students will use formative and summative assessment, personal reflection and critical feedback to inform future planning.

Prerequisite: EPC 3403"

**EPC 4406 - Practicum 4a (0-8-6)**

In the 'Autonomous Teaching' phase of the programme, students complete a 25-30 day practicum in which coursework, including a Professional Development Plan and a preliminary research project from corresponding courses, is implemented in a setting appropriate to the degree strand (ECE, EDT, EPR, ELT). Building on Practicum 3b, students plan, deliver and reflect with increased autonomy, on a minimum 50% of MST teaching time. This ideally includes one full week of teaching taking on the full responsibility of the MST.

Prerequisite: EPC 3903"

**EPC 4909 - Practicum 4b (Internship) (0-12-9)**

In the final 'Autonomous Teaching' phase of the programme, students complete a 35-40 day internship ideally in the same setting where Practicum 4a was completed, in which coursework, including a Professional Development Plan and a Research Project from corresponding courses, are implemented. Building on Practicum 4a, students plan, deliver and reflect with increased autonomy, on a minimum 60% of MST teaching time. This ideally includes two full weeks of teaching, taking on the full responsibility of the MST.

Prerequisite: EPC 4403 or EPC 4406"

**EPR 2003 - Language Arts A (Speaking, Listening and Vocabulary) (3-1-3)**

Explore and examine significant international models of learning and teaching. Additionally, examine and evaluate approaches to the teaching of Speaking, Listening and Vocabulary to EFL learners. Develop and use sophisticated and accurate target language when on teaching practice."

**EPR 2203 - Language Arts B (Teaching Methods for the Primary School Teacher A) (3-1-3)**

Explore appropriate methods and strategies for the effective and integrated delivery of Language Arts in a primary classroom. Identify and evaluate a variety of international models for teaching including principles, concepts and skills. Analyse the implications for integrated content delivery in schools. Select and demonstrate appropriate suitable teaching methods for the particular aspect of language being taught

**EPR 2503 - Language Arts C (Reading/Writing/Literature) (3-1-3)**

Students will explore and analyze the developmental process in children's writing. They will understand how to teach various aspects of writing, including purposes for writing and the many forms or genres of writing. Students will see how writing can be used across the curriculum in the English Medium Primary School. A variety of children's literature will be read and analyzed in terms of its applicability in the primary classroom and this will be used to develop children's literacy by creating motivating tasks

**EPR 2603 - Language Arts D (Teaching Methods for the Primary School Teacher) (3-1-3)**

Explore appropriate methods and strategies for effective, integrated delivery of Language Arts i.e. teaching of reading in an English medium primary classroom. Identify and evaluate a variety of international models for teaching the principles, concepts and skills of English. Consider the implications for integrated content delivery in schools.

**EPR 3003 - Mathematics for the Primary School Teacher (3-1-3)**

Students will develop competency in key content areas necessary to teach primary mathematics at the upper primary level. Students identify and demonstrate key mathematical processes related to content units including: content knowledge related to problem-solving, numbers, operations, decimals, fractions, algebra, geometry, measurement, and data as well as their related skills. Finally, students will examine mathematical problems and be able to explain differences in leveling using specific technical terminology and descriptions.

Prerequisite: EDU 1803"

**EPR 3203 - Mathematics Teaching Methods for the Primary School Teacher (3-1-3)**

Students will be introduced to upper primary Mathematics pedagogy, will connect underlying theory to practice, and will develop essential skills that underpin mathematical thinking. Students will be introduced to Mathematics curriculum and associated resources. Students will learn how children develop number sense and other mathematical concepts and skills associated with the upper primary levels. They will analyse and develop learning activities based on this understanding, and linked to curriculum

Prerequisite: EDU 1803"

**EPR 3503 - Science for the Primary School Teacher (3-1-3)**

Explore and apply contemporary primary science curricula. Integrate and apply the content knowledge, process skills and productive disposition/attitude needed to teach at this level effectively. Explore and demonstrate proficiency related to the nature of science, scientific skills and science terminology for the following science strands: science and scientific methods, life sciences, physical sciences, and earth and space sciences at a high primary level.

Prerequisite: EDU 1802 or EDU 1803"

**EPR 3703 - Science Teaching Methods for the Primary School Teacher (3-1-3)**

Explore and relate underlying theory to teaching and learning of science at the upper primary level. Examine and apply student centered methods and strategies to teach, and assess primary science learning effectively. Consider ways to apply appropriate methods in the local context. Develop grade appropriate learning activities and assessments to support development in a range of content and skill areas.

Prerequisite: EDU 1802 or EDU 1803"

**ERK 3004 - Work Placement (0-40-4)**

Gain relevant engineering experience in an actual working environment in order to provide an opportunity to develop and apply professional work ethics and practices. Transfer of engineering skills learned at college to the workplace is a major feature of this course.

**ESC 2003 - Introduction to Earth and Space Science for the Primary School Teacher (3-1-3)**

Students will be introduced to general concepts of Earth and Space science providing them with the content foundation needed to teach science. Besides defining and using key terms in the in-class discussion and in their responses, students will develop diagrams/models, demonstrate positive scientific attitudes, apply scientific processes and skills, and will complete a number of virtual labs related to the content.

**ESC 2013 - Methods and Theory for Teaching Sciences (3-1-3)**

Students will examine methods and strategies used to teach primary science today. They will explore underlying theory, learning about the processes of science, inquiry, assessment suited to the science classroom, and will outline strategies for success in science activities, in addition to discussing aspects of the primary science classroom that impact planning, teaching and learning.

Prerequisite: EDU 1803"

**ESC 2103 - Inquiry Based Science Teaching and Learning (3-1-3)**

Students will examine Inquiry-based Learning (IBL) as the foundation for the development of teaching, learning and understanding. Differentiate between the various levels of inquiry and explore appropriate models for developing Inquiry-based Learning experiences and higher order thinking skills.

Prerequisite: ESC 2013 or EMA 2013"

**ESC 3013 - Introduction to Life Sciences for the Primary School Teacher (3-1-3)**

Students will be introduced to general concepts of Biology needed to teach life science. They will learn and use appropriate terminology to describe the living and non-living world identifying relationships and cycles that allow for life. They will then identify focal points of the relevant life science curriculum at the grade level(s) of the major.

**ESC 3103 - Introduction to Chemistry for the Primary School Teacher (3-1-3)**

Students will be introduced to general concepts of Chemistry providing them with the content knowledge, key terminology, attitudes, skills and scientific processes needed to teach science. Students will identify focal points of the physical science units at the grade level(s) appropriate to the major and will participate in 5 lab experiences/explorations/investigation linked to the grade level curriculum.

Prerequisite: MTH 1203"

**ESC 3113 - STEM Education for Science Teachers (3-1-3)**

Students will examine and reflect on the value of STEM education and STEM learning in connecting content to process to higher order thinking skills. Students will explore how the processes of STEM aim to produce growth and 21st Century readiness. Using the relevant MOE curriculum, students will identify opportunities and will plan appropriately challenging grade-level STEM learning projects.

Prerequisites: ESC 2013 and ESC 2103"

**FIN 2003 - Financial Management (3-1-3)**

Provides an overview of financial management basics for financial decision-making. Covers the fundamentals of financial management to support both short and long-term financial decisions of the firm. Includes topics related to sources of short-term and long-term financing, financial statement analysis, time value of money, capital budgeting and working capital management.

Prerequisite: ACC 1003

**FIN 2013 - Money and Banking (3-1-3)**

Examines money issues, financial systems and financial intermediation theories. The role of money is stressed in modern economics. Appropriate definitions and understanding of the monetary aggregates are provided to allow conduct of effective monetary policies. In addition, implications of the financial intermediation theory and the 'special' role of banks are discussed in the context of monetary policy and bank regulation.

Prerequisite: ECO 1103

**FIN 2103 - Quantitative Methods (3-1-3)**

Covers time value of money, discounting and compounding as key elements of the mathematics of finance. Discusses parametric and non-parametric statistical significance testing as an integral aspect of the quantitative methods used in decision making. Covers a range of statistical methods include descriptive statistics (measures of location and dispersion), indexing, correlation, simple regression, and time series analysis. Linear programming and optimisation for decision making are also discussed.

Prerequisite: STS 2003

**FIN 3003 - Corporate Finance (3-1-3)**

Provides an understanding and necessary exposure to the various tools used in analyzing and evaluating the financial performance of business in terms of risk and return. Emphasizes the fundamentals of calculation and analysis of the various performance ratios and examine the key issues that affect dividend policies and introduces to the concepts of cost of capital, risk and uncertainty in capital budgeting decisions and elements of international finance.

Prerequisite: FIN 2003

**FIN 3013 - Insurance (3-1-3)**

Reviews global and local insurance industry characteristics, as well as the various roles the insurance industry plays in financial risk management. Studies the insurance industry at both macro and micro levels. Particular emphasis is placed on the challenges and opportunities facing the insurance industry as a result of globalization, and the changes this will bring to the local insurance market.

Prerequisite: FIN 2003

**FIN 3103 - Corporate Governance and Professional Standards (3-1-3)**

Critically examine legal and ethical issues pertaining to the banking and financial services industry. The focus is on the application of legal and ethical principles, as well discussing on current industry risk concerns, such as manipulation of financial markets, Basel III regulatory framework, money laundering, corruption and bribery.

Prerequisite: FIN 2003

**FIN 3113 - Behavioral Finance (3-1-3)**

Surveys research which incorporates psychological evidence into economics. Topics include: prospect theory, biases in probabilistic judgment, self-control and mental accounting with implications for consumption and savings, fairness and altruism, financial market anomalies and theories. Also examines the basics of technical analysis as it is directly related to the market efficiency notion.

**FIN 4003 - Entrepreneurial Finance (3-1-3)**

Covers the planning for starting and managing of a small business. Evaluates the options of entering into a small business and the pros and cons of different forms of ownership. Topics include financing the small business, legal constraints of interest to small businesses and the development of realistic financial forecasts. Analyzes financing constraints from Venture Capital and banks' perspective, building a complete pro forma financial statements and analyzing the company's performance.

Prerequisite: FIN 2003

**FIN 4013 - Corporate and Retail Banking (3-1-3)**

Explores the dynamic environment and structure of the banking industry. Analyzes the extent of the match between the needs of retail clients and products offered by banks. It applies the advanced marketing methods used in retail banking. Also analyzes the financial needs of corporate customers and examines how various banking products satisfy the financial needs of corporation.

Prerequisite: FIN 2013

**FIN 4023 - Financial Assets and Markets (3-1-3)**

Discusses the role of financial markets, the types of financial assets and how they are traded. It examines valuation techniques, derivatives and alternative investments and their associated trading strategies for achieving risk return objectives. From the perspective of equity and capital markets, it explains the importance of capital markets for the economy and corporations.

Prerequisite: FIN 3003

**FIN 4033 - Financial Analysis (3-1-3)**

Provides hands-on experience in financial analysis of business. Examines general tools of financial analysis, theoretical concepts, and practical company valuation issues. Also evaluates the performance, prospects, and value of a business by using financial analysis and valuation methods.

Prerequisite: FIN 3003

**FIN 4043 - Sharia Law and Corporate Governance (3-1-3)**

Examines the sources of Sharia Law and the role of the Sharia Supervisory Board. It further provides an understanding of the formation, authority and responsibilities of the Sharia Supervisory Board. Finally the course elaborates on the corporate governance in Islamic Financial Institutions, and discusses the importance of Sharia Governance, Risk management, legal and regulatory aspects of Sharia Governance, Internal Sharia Controls and Sharia Audit.

Prerequisite: FIN 3103

**FIN 4053 - Islamic Financial Markets (3-1-3)**

Examines the structure of Islamic financial markets, instruments, and institutions. Looks at the historical development of Islamic financial Assets and markets. Discusses the Islamic money market and compares and contrasts it to the conventional money market. It further elaborates on Islamic Capital markets and discusses the Sharia compliant instruments involved, including Sukuks, Sharia complaint equity and Mutual Funds. Also provides an overview of Islamic REITs, exchange traded funds and the role of derivatives.

Prerequisite: FIN 2013

**FIN 4103 - Bank Financial Management (3-1-3)**

Discusses how bank performance is measured and evaluated using operational performance measures. It demonstrates how banks deal with the various types of risks and explains the different components of bank asset and liability management. It looks at various bank strategies and behaviour including bank funding, lending and pricing.

Prerequisite: FIN 2013

**FIN 4113 - International Finance (3-1-3)**

Contrasts international finance with domestic finance. Discusses the international financial environment, the foreign exchange market and foreign exchange exposure management. Examines the international monetary system, balance of payments issues, as well as the main factors affecting foreign exchange rates. It discusses how the microstructure of international trade helps in the development of an open economy.

Prerequisite: FIN 2013

**FIN 4123 - Capital Investment (3-1-3)**

Critically discusses concepts such as the time value of money, risk and return relationships, as well as bond and stock valuation models in the context of financial markets and capital investment. Examines a range of instruments, principles and theories related to these markets. Provides the ability to synthesize related capital investment techniques and strategies.

Prerequisite: FIN 2003

**FIN 4133 - Portfolio Management and Wealth Planning (3-1-3)**

Provides in-depth knowledge of portfolio management. Comprised of a wide range of portfolio management concepts, theories and traditional asset classes with a specific focus on the ability to synthesize complex portfolio management principles, as well as the ability to utilize portfolio management construction tools and evaluation techniques in a professional manner.

Prerequisite: FIN 2103

**FIN 4143 - Islamic Economics (3-1-3)**

Considers the implications of the application of Sharia law on economic and financial systems. It also compares the different sources of knowledge for economics, stresses the importance of an Islamic worldview to Islamic economics and compares the Islamic economic system with conventional economics. The course further explains how consumption and production are carried out in Islam, and highlights the development of historical Islamic economic institutions such as Zakah, Kharaj, and Waqf, and their economic roles.

Prerequisite: FIN 4043

**FIN 4153 - Islamic Banking (3-1-3)**

Examines the sources and application of funds in Islamic Banking, as well as to asset-based lending products, service-based products and partnership contracts. Provides an overview of the financial accounting for Islamic banks and discusses general risk management mechanisms in Islamic banks.

**FIN 4163 - Risk Management of Islamic Financial Institutions (3-1-3)**

Deals with risk identification, characterization and mitigation measures in Islamic financial institutions. It looks at supervisory and regulatory issues in Islamic Financial Institutions that affect how risk is managed. It discusses the role of Shari'ah compliance audits in risk control, and reviews Islamic accounting processes that impact risk management. The course looks at how risk is assessed, characterized and managed in Ijara, Musharaka and Murabaha operations, and in a range of Islamic finance items such as Mudaraba, Wadia and Amana products.

Prerequisite: FIN 4053"

**FIN 4203 - Finance Research Project (3-1-3)**

The project allows students to use the research skills from previous courses as a framework for a final industry-based research project for the Finance major. The final semester research project encourages students to identify and address learning outcomes across the major. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment.

**FND 0020 - Pre-Foundations English (24-6-0)**

Covers English vocabulary, grammar and communication skills at CEFR level A1+. Students will engage with short, simple texts about familiar topics and situations, and develop an understanding of common phrases and high-frequency vocabulary on topics of immediate personal relevance.

**FND 1016 - Foundations English Level I (24-6-0)**

Covers English vocabulary, grammar and communication skills at CEFR level A2. Students will engage with short, simple texts about familiar topics and situations, write brief messages and paragraphs composed of short sentences on a familiar topic, and communicate effectively in simple routine exchanges of familiar information.

**FND 2016 - Foundations English Level II (20-6-0)**

Covers English vocabulary, grammar and communication skills at CEFR level A2+. Students will engage with detail and overall meaning in simple texts of a less familiar nature, write short descriptive paragraphs about their experiences and opinions, and communicate effectively using appropriate vocabulary and grammar structures at the A2+ level.

**FND 3016 - Foundations English Level III (20-6-0)**

Covers academic English vocabulary, grammar and communication skills at CEFR level B1. Students will engage with a range of short articles and reports, write multi-paragraph opinion essays on topics of general interest, and communicate effectively using a range of vocabulary and grammar structures at the B1 level.

**FND 4016 - Foundations English Level IV (20-6-0)**

Covers academic English vocabulary, grammar and communication skills at CEFR level B1+. Students will engage with a broad range of articles, reports and introductory academic texts, write coherent argumentative essays, and communicate effectively in an academic context using a range of vocabulary and grammar structures at the B1+ level, as assessed by an external, benchmarked academic English proficiency exam.

**HEM 1103 - EMT-Basic (2-2-3)**

The EMT-B level prepares the student to provide basic emergency health care in the clinical environment. The course will introduce the student to the knowledge, skills and competencies to assess, diagnose and manage patients. EMT-B will also assist other practitioners in the clinical environment under the supervision of a qualified practitioner.

**HEM 2015 - Medical Emergencies (3-4-5)**

Provides the necessary theoretical knowledge, skills and competencies to provide medical care to patients in the emergency care setting. A wide range of non-traumatic pathologies, illnesses and diseases will be presented at the intermediate level in the scope of emergency medicine. In addition it addresses the community's needs for health prevention, promotion and curative care. Caters for special populations and contemporary epidemiology

Prerequisite: HEM 1103

**HEM 2024 - Trauma Emergencies (2-4-4)**

Provides the necessary theoretical knowledge, skills and competencies to provide medical care to patients in the prehospital and in-hospital emergency care setting. A wide range of traumatic pathologies, illnesses and diseases will be presented at the intermediate level in the scope of emergency medicine. In addition it addresses the community's needs for health prevention, promotion and curative care. Caters for special populations and contemporary epidemiology.

Prerequisite: HEM 1103

**HEM 2033 - EMS Applied Pharmacology I (2-2-3)**

Provides an introduction into the basic concepts and fundamentals of applied pharmacology. Focuses on the basic drug classification and concepts with special consideration to Emergency Medical Care. This subject requires you to link your understanding of physiology, pathophysiology and emergency medical care to the prescription and administration of medications. Each of the medications that are commonly prescribed and/or administered by emergency care practitioners within the UAE are dealt with at an introductory level based on the relevant scope of practice.

Prerequisite: HEM 1103

**HEM 2103 - Foundations of Professional Practice (2-2-3)**

This course develops the knowledge, skills and competencies required for the multiple roles the paramedic is expected to play in the EMS environment. This encompasses leadership, basic EMS administration, management of emergency response situations, facilitating transfer of knowledge and skills, and promoting quality improvement processes.

Prerequisite: HEM 1103

**HEM 2123 - Obstetric, Gynecology, Neonatal and Pediatric Emergencies (2-2-3)**

This course builds on the knowledge and skills that were learned in the EMT-B course for the management of gynecological, obstetric, pediatric emergencies and neonatal resuscitation. You will apply previous knowledge of pharmacology and medical and trauma emergencies to disorders within this special patient population. You will attain skills and competencies which are specific to the different subgroups within this special population. You will merge the knowledge and blend the skills sets to competently manage these emergencies at the intermediate life support level of prehospital care.

Prerequisites: HSC 1023, HEM 1103, HSC 1113, HSC 1033, HSC 1123 and HSC 1803

**HEM 2903 - Ambulance Preceptorship I (3-1-3)**

The course is designed for the preparation of the paramedic student and involves supervised practice of previously studied theory. You will integrate knowledge, skills and competencies learned in the classroom and clinical lab with real patients. You will attend shifts in the clinical environment and work with a clinical facilitator as part of a team. You will work at the relevant scope of practice and the clinical facilitator will guide you through aspects of the calls and will carry out pre-incident and post-incident briefing to encourage a dynamic learning environment.

Prerequisite: HEM 1103

**HEM 2913 - Hospital Preceptorship I (3-1-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions.

Prerequisites: HEM 2015 and HEM 2024

**HEM 2923 - Ambulance Preceptorship II (3-1-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions.

Prerequisites: HEM 2015, HEM 2024 and HEM 2903

**HEM 3006 - Advanced Prehospital Emergency Care I (4-2-6)**

The aim of this unit is to develop clinical skills for the management of patients suffering from airway, cardiovascular, respiratory and immunological emergencies in preparation for your practice as a beginning level advanced care paramedic. You will be able to adopt the clinical reasoning skills that underpin the management of such patients and also consider the impact of ageing in relation to this group of people.

Prerequisites: HEM 2015, HEM 2024, HEM 2033, HEM 2123, HEM 2903, HEM 2913 and HEM 2923

**HEM 3013 - EMS Applied Pharmacology II (2-2-3)**

Provides an introduction into the basic concepts and fundamentals of applied pharmacology. Focuses on the basic drug classification and concepts with special consideration to Emergency Medical Care. This subject requires you to link your understanding of physiology, pathophysiology and emergency medical care to the prescription and administration of medications. Each of the medications that are commonly prescribed and/or administered by emergency care practitioners within the UAE are dealt with at an introductory level based on the relevant scope of practice.

**HEM 3106 - Advanced Prehospital Emergency Care II (4-4-6)**

The aim of this unit is to develop clinical skills for the management of patients suffering from medical and surgical emergencies to progress to the advanced paramedic level. You will develop the clinical reasoning skills that underpin the management of such patients and also consider the impact of ageing in relation to this group of people. Prerequisite: HEM 3006

**HEM 3113 - Primary Health Care (2-2-3)**

Provides the emergency medical care student with the clinical competencies, skills and management in order to function effectively in a Primary Health Care setting. Enables the students to develop a deeper understanding of community and primary health care by exploring the core concepts of primary and community based care. Identifies factors associated with the health of communities and examines the current structures of community care in the United Arab Emirates, which will enable students to implement primary health care interventions. Prerequisites: HEM 3006 and HEM 3013

**HEM 3903 - Ambulance Preceptorship III (0-12-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions.

Prerequisite: HEM 2923

**HEM 3913 - Hospital Preceptorship II (0-12-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions. Prerequisites: HEM 2913 and HEM 3006

**HEM 3923 - Responder Preceptorship I (0-12-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions. Prerequisites: HEM 3006, HEM 3106 and HEM 3903

**HEM 4006 - Advanced Gynaecological/Obstetric and Paediatric Emergencies (4-4-6)**

A wide range of Obstetrical and Gynecological emergencies as well as Neonatal and Pediatric medical and trauma pathologies, illnesses and diseases will be presented at the advanced level in the scope of emergency medicine. In addition, it addresses the community's needs for health prevention, promotion and curative care. Caters for special populations and contemporary epidemiology

Prerequisites: HEM 3006, HEM 3013, HEM 3106, HEM 3113, HEM 3903, HEM 3913 and HEM 3923

**HEM 4013 - Leadership in Professional Practice (2-2-3)**

Leadership is a vital part of delivering high quality healthcare for all healthcare professionals. This course develops the knowledge, skills and competencies required for the multiple leading roles the advanced paramedic is expected to play in the EMS environment. This encompasses leadership, basic EMS administration, management of emergency response situations, facilitating transfer of knowledge and skills, and promoting quality improvement processes. Prerequisites: HEM 2103, HEM 3006 and HEM 3106

**HEM 4106 - Advanced Standards of Prehospital Emergency Care and Transport (4-4-6)**

This unit is designed to continue the development and demonstration of professional skills as critical reflection that help define you as a health care practitioner and set you on a pathway of continuing professional development. As a professional practitioner you will develop evidence based knowledge and implement reflective processes to improve the quality of patient care.

Prerequisite: HEM 4006

**HEM 4903 - Hospital Preceptorship III (0-12-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions. Prerequisite: HEM 3913

**HEM 4913 - Responder Preceptorship II (0-12-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions. Prerequisite: HEM 3923

**HEM 4923 - Responder Preceptorship III (IST Optional) (0-12-3)**

The course is designed to prepare the paramedic student for the job which involves the supervised practical application of previously studied theory. You will be required to integrate knowledge, skills and competencies learned in the classroom and clinical laboratory settings with real patient interactions. Prerequisite: HEM 4913

**HFT 4002 - Helicopter General Handling Ground School I (3-1-2)**

This is the first course of General Handling. The course is the first part of the conversion to type applied course. HFT 4002 covers the basics of Aviation Law and Daylight Flying (Visual Flight Rules) Operational Procedures and Practical Skills Procedures. Students are provided instruction in manoeuvre procedures, air traffic and aviation law, principles of flight and emergency procedures.

Prerequisites: AVS 2133, AVS 3113 and AVS 4012

**HFT 4013 - Helicopter General Handling Ground School II (4-1-3)**

This is the second course of General Handling academic learning and covers all basic technical content of the aircraft. The course provides instruction on the specific technologies of the Bell 407 aircraft and complements Aviation Science Core courses in Safety Systems, Avionics, Aircraft Systems, Aero-Engines and VFR Instruments.

Prerequisite: HFT 4002

**HFT 4022 - Helicopter General Handling Basic (4-1-2)**

Covers all Basic practical flying activities necessary for a Helicopter Pilot to successfully and safely fly an aircraft through a range of basic manoeuvres such as take-off and landing, straight and level flight and climbing and descending under forward flight, turning and the full range of hover manoeuvres (take off, land, turn, move forward, backwards and sideways). The basic manoeuvres are carried out in daylight hours, under supervision and in the area near the airfield.

Prerequisites: AVS 2133 and HFT 4002

**HFT 4103 - Helicopter General Handling Advanced (6-1-3)**

Provides the students with practical application of all the learning achieved to date. The flying of the Advanced Phase covers more advanced versions of the basic manoeuvres taught in the Basic Phase and adds in the high level competences required to safely manage Helicopter specific emergency situations. In addition, new more complex (and difficult) manoeuvres are included

Prerequisite: HFT 4022

**HFT 4113 - Helicopter Instrument Flying Ground School (4-1-3)**

This course is a classroom academic Ground School providing students with the knowledge and skills to configure (program) read and interpret instrument used in Instrument Flight Operations, and also conduct Instrument Operations Procedures and Emergencies. The course is large as it includes Procedural Navigation (normal included as a separate course).

Prerequisite: HFT 4002

**HFT 4122 - Helicopter Instrument Flying (3-1-2)**

The Instrument Flight Phase provides students with the skills and competencies to successfully and safely handle a helicopter in Instrument Meteorological Conditions and teaches pilots to flying the aircraft using only Instruments as visual cues. HFT 4122 develops a student's practical competencies (both physical and cognitive).

Prerequisite: AVS 2133

**HFT 4203 - Helicopter Navigation (4-1-3)**

The Low-Level Flight and Navigation Phase provides the student with the skills and competencies to operate the helicopter in close proximity with the ground and ground based objects and to navigate the helicopter at low level. The phase includes both academic and practical instruction. Subjects covered include but are not limited to: navigate by pilotage and dead-reckoning, perform slope operations, negotiate wire obstacles, perform terrain flight mission planning, perform terrain (following) flight, perform confined area operations, perform ridgeline and pinnacle operations.

Prerequisites: AVS 2133 and HFT 4002

**HFT 4212 - Helicopter Night Flying (3-1-2)**

The Night Flying Phase, known as the Night Vision Goggles Phase provides the student with the skills and competencies to safely manoeuvre the helicopter after daylight hours. The manoeuvres covered are those covered in all the flying phases of instruction covered until this point but with the additional complication of wearing Night Vision Goggles and flying at night.

Prerequisites: AVS 2133 and HFT 4002

**HFT 4221 - Helicopter Mission Flying (2-1-1)**

The Mission Flying Phase is the final and most applied of all the Helicopter Flying Courses and brings together all the individual skills and competencies gained during the whole of the Bachelor. The student will now use the Helicopter Pilot and Aviation Science course knowledge and skills to carry out 8 Military Helicopter Mission Profiles. The course is totally practical and applied.

Prerequisites: AVS 2133 and HFT 4002

**HIM 1203 - Health Information Coding I (Introduction) (3-1-3)**

Covers the basics in applying appropriate codes from the latest International Classification of Diseases (ICD) to classify events of morbidity, mortality, surgical procedures and other non-surgical interventions with an emphasis on accuracy, completeness, and sequencing. It covers all body systems. Maternity, oncology, and external causes of morbidity and mortality are also covered. Factors influencing health status and contact with health services are included.

Prerequisite: HSC 1033

**HIM 2003 - Health Information Coding II (Intermediate) (3-1-3)**

Offers a comprehensive approach to incorporate coding principles from theory to practice at an intermediate level, as well as introducing students to the science of pharmacology, focusing on the rationale for appropriate code assignment. Students are required to apply their knowledge of pharmacology when coding case studies. Students are also required to successfully complete HIM 1203 HI Coding I before commencing this course.

Prerequisite: HIM 1203 or HSD 1053

**HIM 2113 - Applied Pathophysiology I (3-1-3)**

Introduces pathophysiological processes of the body systems. The etiology, clinical features, diagnostic testing procedures and management of a selection of disorders affecting the major body systems is studied namely: cardiovascular, respiratory, gastrointestinal; including blood and lymphatic and endocrine system. An understanding of medical terminology used in describing clinical signs and symptoms, diagnostic techniques (laboratory based and radiological), surgical and medical procedures performed that comprise the patient's record is developed.

Prerequisite: HSC 1033

**HIM 2203 - Health Information Management Studies (3-1-3)**

Develops an understanding of comprehensive health information management skills: categorisation and processing of patient information into indexes, registers, registries, as well as the more common nomenclatures and classification systems, including the activities and functions of a typical health information management department. Introduces computerised record processing systems, using related patient data systems as examples whilst managing data quality and maintaining patient confidentiality.

Corequisite: HIM 2902

**HIM 2313 - Applied Pathophysiology II (3-1-3)**

This course is a continuation of HIM 2113 Applied Pathophysiology I. The course continues to introduce pathophysiological processes of the body systems. The etiology, clinical features, diagnostic testing procedures and management of a selection of disorders affecting the major body systems is studied namely: urinary, musculoskeletal, nervous systems, skin disorders; female reproductive system, obstetrics and newborn care as well as male reproductive system.

Prerequisite: HIM 2113

**HIM 2323 - Legal and Ethical Aspects in HIM (3-1-3)**

This course provides knowledge of medico legal issues and how this affects the health information manager. It also explores ethical challenges in the management of health information as well as the contemporary health care setting. Upon successful completion of this course, students possess knowledge of medical - legal issues and how this affects the health information manager. Students learn to appreciate the ethical challenges in the management of health information in contemporary health care settings.

**HIM 2403 - Introduction to Management in Healthcare (3-1-3)**

Covers basic understanding of organizational management, motivation, leadership and conflict management is developed, along with an understanding of the functions of management from the viewpoint of a manager who is responsible for creatively solving problems and facilitating creative problem solving efforts in others.

**HIM 2902 - HIM Hospital Preceptorship I (0-8-2)**

Provides an opportunity for the application of knowledge and skills in an active health record department. Students acquire knowledge in, and experience with, the structure and responsibilities of a health records department and interdepartmental relationships. Students gain procedural experience in assembly, analysis, filing, management of master patient index, management of incomplete record processing, record tracking, and release of health information.

Corequisite: HIM 2203

**HIM 3003 - Biostatistics (3-1-3)**

Introduces basic scientific principles, applied research methods, statistical concepts, and descriptive and inferential procedures typically used to enhance understanding health information. Course topics include: levels of measurement, frequencies, normal distributions, and graphs; rates and proportions, confidence intervals, and evaluating a medical test; correlations and comparing means; including hypothesis testing applied to case studies.

**HIM 3013 - Health Information Coding III (3-1-3)**

Develops further knowledge on health information coding using the latest ICD version, along with the application of abstracting complex case studies and the implication of these processes on the provision of better health planning, financing and administration. An understanding of the link between case mix, diagnostic related groups and health funding models and how these tools contribute to the provision of better health outcomes is also developed. Students need to successfully complete HIM 2003 HI Coding II before commencing this course.

Prerequisite: HIM 2003

**HIM 3103 - Health Informatics I (3-1-3)**

Introduces essential concepts and applications of information and communication technologies in healthcare. Upon successful completion of this course, students are expected to understand and apply system thinking to describe healthcare services; and assess computer hardware, software and networking technologies as components of healthcare information systems. Students need to successfully complete this course in order to proceed to HIM 4023 Health Informatics II.

Prerequisite: CIS 1303

**HIM 3113 - Health Information Coding IV (3-1-3)**

This course continues to develop the student's understanding of the coding function with an emphasis on using health information technology applications to assist in the coding process. It examines key elements of revenue cycle management and analyzes the function of HIM professionals using HIT applications in this process. Students evaluate issues related to coding compliance and recommend a coding compliance program based on national and international standards. Students must successfully complete HIM 3013 Health Information Coding III before commencing this course.

Prerequisite: HIM 3013

**HIM 3303 - Epidemiology (3-1-3)**

Develops a basic understanding of core and central concepts in epidemiology. Includes historical origins, purpose and modern uses of epidemiology. Emphasis is on applied research, measurement, and data interpretation. Epidemiological study designs and case studies are used to enhance understanding of investigation of disease outbreak and to develop skills and abilities in critical thinking and evaluation.

Prerequisite: HIM 3003

**HIM 3912 - Coding Preceptorship I (0-8-2)**

Offers a clinical coding preceptorship where students apply diagnosis and procedure coding techniques to actual patient records in an acute care practice environment with an emphasis on speed, accuracy, completeness and sequencing. In addition, the preceptorship provides an opportunity to analyze and suggest improvements to coding practices. Students must successfully complete HIM 3912 Coding Preceptorship I before proceeding to HIM 3914 Coding Preceptorship II in the following semester.

Prerequisite: HIM 2003

**HIM 3914 - Coding Preceptorship II (0-16-4)**

Offers a clinical coding preceptorship where students apply diagnosis and procedure coding techniques to actual complex patient records in an acute care practice environment. The coding preceptorship provides opportunities to code increasingly complex records with an emphasis on speed, accuracy, completeness and sequencing. In addition, the preceptorship provides an opportunity to analyze and suggest improvements for best coding practices standards. Students must successfully complete HIM 3912 Coding Preceptorship I before commencing this course.

Prerequisite: HIM 3912

**HIM 4013 - Quality Management in Healthcare (3-1-3)**

This course focuses on the concepts and processes of quality and how quality is applied throughout healthcare. It discusses activities and methods of quality improvement in health care facilities generally, and in the health information management department specifically where a quality improvement process is a project within the course. It also addresses the attributes of an effective quality improvement team. In addition, the course includes an introduction and application to the concept of risk management and utilization review processes.

**HIM 4023 - Health Informatics II (3-1-3)**

Applies concepts related to strategic planning, analysis, design, evaluation, selection and implementation of health information systems. The course develops further understanding of health informatics field and the different patient care applications. Finally it applies assessment and evaluation methodologies to e-health applications. Students need to successfully complete HIM 3103 Health Informatics I before commencing this course.

Prerequisite: HIM 3103

**HIM 4033 - Finance Management in Healthcare (3-1-3)**

Introduction to accounting systems and controls in healthcare, the accounting cycle and books of original entry, accrual accounting and reporting and interpreting financial statements. Topics include assets, liability, equity, balance sheets, income statements, cash flow, inventory, depreciation, managerial accounting, cost accounting, budgeting and decision making as related to cost control. Financial concepts will be covered in terms of its applications to the healthcare industry.

**HIM 4103 - Health Data Analysis (3-1-3)**

Assesses the collection, interpretation and uses of health data beyond the client/patient treatment and disease/operation classification stages. Key emphases include: health data applications in management and clinical decision-making; performance indicators for health care funding, use and evaluation of coded and non-coded sources of health data for research, data management for clinical trials and regulatory and management issues surrounding registries and databases.

Prerequisite: HIM 3003

**HIM 4303 - Health Care Economics and Health Insurance (3-1-3)**

Develops an understanding of health economics and economic analysis of the health care market. Identifies and assesses factors that control the health care insurance industry; describes and discusses the different models of health care cost control, including case mix funding systems and managed care programmes; describes and discusses the impact of adopting new technologies on cost of health care services; and finally, considers and discusses the ethical and political aspects of these new health care funding models from a global perspective.

**HIM 4413 - Strategic Management in Health Care (3-1-3)**

Focuses on strategic management and its application in health care. Topics covered include: strategic planning and forecasting; marketing; organizational assessment; benchmarking; quality improvement; workplace re-design; and process re-engineering. Applies knowledge and skills gained to develop and evaluate departmental strategic plan and demonstrate the implementation of the plan at departmental and organizational levels.

Prerequisite: HIM 2403

**HIM 4904 - HIM Hospital Preceptorship II (0-16-4)**

Allows Health Information Management students to work on specific projects related to the programme goals. Projects will be selected from any of the major health information management functions and also in relation to the requests and needs of the host site. The emphasis of this practicum is on working independently and applying work ethics and professionalism. A final project report is to be submitted to the host site supervisor and college instructor.

**HMI 2002 - Medical Imaging Technology I (3-1-3)**

Identify the basic design and function of standard medical X-ray equipment, X-ray image receptors, and X-ray image processing. In addition, recognise and explain the function of the various parts of an X-ray unit, how X-rays are produced, how X-rays interact with matter and the various factors that affect the quality and quantity of the X-rays produced. Describe the quality of medical images in precise terms, such as spatial and contrast resolution, with regard to As Low As Reasonably Achievable (ALARA) principles.

Prerequisite: HSC 1113

**HMI 2003 - Patient Care in Medical Imaging I (3-1-3)**

Develop an understanding of the fundamentals of patient care in medical imaging environments, specifically in the areas of infection control, manual handling, patient communication and data confidentiality. Develop an understanding of patient care for mobile and restricted mobility patients, and clients frequently encountered in non-critical medical imaging departments. In addition to an introduction to basic radiation protection of patients.

Prerequisite: HSC 1123

**HMI 2102 - Medical Imaging Technology II (3-1-3)**

Examine how digital medical images are produced, manipulated and transmitted between medical imaging modalities and hospital information systems. Define dedicated digital imaging systems such as Patient Archive and Communication Systems (PACS), Radiology Information Systems (RIS), and the parameters used in analyzing digital image quality. Investigate the design, function and operation mobile and theatre X-ray equipment.

Prerequisite: HMI 2002

**HMI 2303 - Medical Imaging Positioning and Procedures I (3-1-3)**

Recognize the art of radiographic positioning for plain X-ray imaging, focusing on the upper and lower extremities, the spine, pelvis, hips, and chest. A mix of theory and simulated practice using medical imaging terminology will provide and develop radiographic positioning and patient care skills. Using the acquired knowledge and skills, examine a plain X-ray imaging of the appendicular skeleton, spine, and chest in modern medical imaging practice.

Corequisites: HMI 2002 and HMI 2403

**HMI 2403 - Medical Imaging Anatomy and Pathology I (3-1-3)**

Examine image critique skills for diagnostic images of the upper and lower extremities, the spine, pelvis, hips, and chest. Recognise, identify and describe normal medical imaging anatomy and commonly encountered pathologies on a range of X-ray examinations. Apply specific image interpretation terminology to evaluate image content in terms of normal and abnormal findings and to assess image quality. Develop an understanding of the nature of disease and the role of X-ray imaging in patient care and clinical management.

Prerequisites HSC 1033

Corequisite: HMI 2303

**HMI 2503 - Medical Imaging Positioning and Procedures II (3-1-3)**

Recognize the art of radiographic positioning, and terminology used for procedures of plain X-ray imaging of abdomen, skull, maxillary-facial structures, and dentition. This course also focuses on contrast studies of gastrointestinal, urinary systems, and examine mobile and theatre imaging. Use medical imaging equipment to perform radiographic positioning and relevant patient care skills. Develop skills in plain medical imaging and the role of mobile, theatre and contrast media examinations in modern medical imaging practice.

Prerequisite: HMI 2303

Corequisite: HMI 2603

**HMI 2603 - Medical Imaging Anatomy and Pathology II (3-1-3)**

Examine image critique skills for diagnostic images of the abdomen to include contrast studies of gastrointestinal, urinary systems. Additionally, examine image critique skills for diagnostic images of the skull, maxillary-facial structures, dentition, mobile and theatre imaging. Apply specific image interpretation terminology to evaluate image content in terms of normal and abnormal findings. Develop an understanding of the nature of disease and the role of X-ray imaging in patient care and clinical management. Actual images will be included for analysis of the image and pathologies that are present

Prerequisite: HMI 2403

Corequisite: HMI 2503

**HMI 2613 - Clinical Preceptorship I (0-12-3)**

Apply previously taught theory of medical imaging technique and patient care into authentic clinical practice. Learning takes place within safe, supervised, clinical learning sites approved by partner health authorities. Clinical Preceptorship will be supervised by trained preceptors to develop skills in safe radiographic technique and patient care for plain X-ray imaging of the upper and lower extremities, spine and chest.

Prerequisites: HMI 2002, HMI 2303 and HMI 2003

**HMI 3002 - Medical Imaging Technology III (3-1-3)**

Develop a knowledge base in the design of equipment used to produce images in Nuclear Medicine (NM) examinations. Examine the design, use, and function of fluoroscopy equipment used in diagnostic, angiographic and interventional radiology. Evaluate radiation doses in specialist modalities to determine best clinical application. Demonstrate the use of dedicated mammography units and mammography accessories and compare mammographic equipment with standard X-ray equipment.

Prerequisite: HMI 2102

Corequisite: HMI 3103

**HMI 3003 - Patient Care in Medical Imaging II (3-1-3)**

Develops knowledge and skills in basic concepts of patient care in ward, theatre, trauma, and acute care medical imaging environments. Includes safe patient handling for therapeutic interventions such as drips, oxygen, suction and electronic patient monitoring. Develop applied understanding of the safe administration of radiological contrast agents to include precautions of use and emergency responses to adverse contrast media reactions.

Prerequisites: HMI 2003, HMI 2503, and HMI 2613

**HMI 3013 - Clinical Preceptorship II (0-12-3)**

Apply previously taught theory into clinical practice. Learning takes place within safe, supervised, clinical learning sites. Develop further skills in the radiographic imaging of the skull, the abdomen and in elementary fluoroscopic and contrast study examinations.

Prerequisites: HMI 2503, HMI 2603 and HMI 2613

**HMI 3103 - Medical Imaging Positioning and Procedures III (3-1-3)**

Describe application of specialized modalities; pediatric imaging, mammography, diagnostic and interventional fluoroscopy, Nuclear Medicine. Develop applied understanding of these modalities to evaluate their best use and their role in medical imaging practice.

Prerequisite : HMI 2503

Corequisite: HMI 3002

**HMI 3113 - Specialised Imaging I (3-1-3)**

Develop the required technical knowledge of Computerized Tomography as a specialized imaging modality including an understanding of the scientific principles that form the basis of CT system. Describe the design and function of specific equipment used in Computerized Tomography (CT). Evaluate the clinical application of diagnostic and interventional CT in terms of clinical outcomes, radiation safety and patient care. Evaluate safe operation of medical imaging equipment in the acute care imaging.

Prerequisite: HMI 3103

Corequisite: HMI 3233

**HMI 3213 - Radiation Safety and Biology (3-1-3)**

Develop knowledge of biological response to radiation. Take objective decisions regarding risks and benefits of radiation, radiation protection. Describe factors affecting biological response and dose limits. Develop applied understanding of best safety practices.

Co-requisite: HMI 3113

**HMI 3223 - Cross Sectional Anatomy (3-1-3)**

Analyze cross-sectional normal anatomy and abnormal pathologies of brain, thorax, abdomen, and pelvis in CT and MRI images. Develop the ability to evaluate cross-sectional images and discuss the value of multi-planar imaging in modern medical imaging practice.

Prerequisite: HMI 2603

Co-requisite: HMI 3113

**HMI 3233 - Clinical Preceptorship III (0-12-3)**

Apply previous theory into clinical practice and develop further skills in emergency CT imaging, Angiographic imaging and, mammography. Learning takes place within safe, supervised, clinical sites.

Prerequisites: HMI 3013 and HMI 3103

**HMI 4003 - Quality Management in Medical Imaging (3-1-3)**

Develop skills in explaining and evaluating international quality management systems that are used to maintain and improve performance in health care organizations and justify their application in medical imaging. Apply basic quality measurement tools and critically appraise the results they provide. Analyze how quality management tools are used by health care organizations to deliver quality improvement that is timely, effective and patient centered. Assess how quality standards are used to maintain and improve medical imaging services as an integral part of a total quality management program.

**HMI 4013 - Specialised Imaging II (3-1-3)**

Develop the required technical knowledge of specialized imaging modalities including an understanding of the scientific principles that form the basis of each imaging system. Describe the design and function of specific equipment used in Magnetic Resonance Imaging (MRI) understand the different MRI sequences and scans pertained to different anatomy. Develop necessary skills to explain and evaluate the technical aspects of this advanced imaging system and its clinical applications.

Prerequisite : HMI 3113

**HMI 4023 - Clinical Preceptorship IV (0-12-3)**

Apply previous theory into the clinical practice and develop skills of advanced trauma, advanced (CT) imaging, and basic (MRI) to prepare for the clinical preceptorship V track of choice. Learning takes place within safe, supervised, clinical sites.

Corequisite: HMI 4013

**HMI 4106 - Clinical Preceptorship V (0-24-6)**

Apply previously taught theory of advanced medical imaging techniques and patient care into authentic clinical practice. Select an elective modality; Computed Tomography (CT), Magnetic Resonance Imaging MRI, or mammography to practice in the clinical setting under a mentor's supervision.

Prerequisites: HMI 4023

Corequisite: HMI 4113

**HMI 4113 - Specialized Imaging III (3-1-3)**

Analyze knowledge gained and applied understanding of an elected area of specialist practice such as Computed Tomography (CT), Magnetic Resonance Imaging MRI, or breast imaging. Modalities offered for elective study are based on clinical availability to support the development of advanced clinical practice skills. Reflect upon personal competencies in a specialist imaging modality to evidence understanding of clinical practice at an advanced level.

Prerequisites: HMI 4013 ,HMI 3103

Corequisite: HMI 4106

**HMI 4203 - Professional Practice (3-1-3)**

Develop an understanding of the new imaging modalities available in the medical imaging department and identify the best practice of their clinical application and indications. Demonstrate knowledge of the latest imaging protocols implemented in MRI, CT, PET/ CT, breast imaging as well as molecular and functional imaging for different pathologies. Develop effective understanding of the work flow in the digital environment for the best interest of patients. Develop effective methods to incorporate HIS/RIS for electronic requesting, referrals education, and patient communication as well as its impact on health care cost and radiation dose.

Prerequisites: HMI 3113

Corequisite: HMI 4013

**HML 2013 - Clinical Hematology I (1-4-3)**

Students are introduced to the work carried out in a haematology laboratory with emphasis on the importance of correct documentation, sample collection and quality of results. The normal haemopoietic red cell production, including the synthesis and function of haemoglobin will be discussed along with the use of blood cell counters and data interpretation. Students learn to recognize normal and abnormal red cells and describe the cause and effects of various types of anaemia.

Prerequisites: HSC 1033 and HSC 1123

**HML 2033 - Medical Microbiology (1-4-3)**

The course introduces theoretical concepts and practical techniques used in the classification, isolation and identification of microorganisms, concepts of infection, transmission of disease, pathogenicity, body defense mechanisms, prevention and control of infections. Students learn techniques used in diagnosis of bacterial infections, safe working practices and the need for quality control are an integral part of the course. Through laboratory practical exercises and observation the role of the medical technologists in the management of infectious diseases is delineated.

Prerequisites: HSC 1033 and HSC 1123

**HML 2043 - Clinical Chemistry I (1-4-3)**

Learning the foundations for the theory and practical aspects of Clinical Chemistry is important to build on for the subsequent clinical chemistry II course. Identification of laboratory safety, mathematics, quality assurance and analytical principles of basic clinical chemistry procedures are covered. At a novice level and introduction to normal physiology and common pathologies are discussed and analysed. Theoretical learning is applied through manual techniques during laboratory exercises, applying principles to the analysis of the chemical constituents of blood and other body fluids.

Prerequisites: HSC 1033, HSC 1123 and HSC 1023

**HML 2053 - Immunology (1-4-3)**

In this course students will study how the immune system defends the body against attack by microorganisms and parasites, how it discriminates between self and nonself, how it deals with foreign molecules, and how it recognises and deals with neoplastic and virally transformed cells as well as transplanted organs, cells and proteins. Immunological procedures will be introduced as the basis of many hematological, microbiological, biochemical and histopathological tests.

Prerequisite: HSC 1033

**HML 2113 - Systematic Bacteriology (1-4-3)**

Further identification and clinical correlations of bacteria encountered in clinical specimens follows on from Medical Microbiology; performing procedures and interpretation of microscopic, cultural, biochemical and serological techniques used in the isolation and identification of bacteria commonly encountered in the medical microbiology lab. Instruction is given dangers handling biohazardous clinical specimens and perform tasks safely, following aseptic procedures. Performance and interpretation of antimicrobial susceptibility tests are covered.

Prerequisite: HML 2033

**HML 2143 - Clinical Hematology II (1-4-3)**

Begins with instruction on the detection, diagnosis and lab investigation of the hemoglobinopathies and the importance of sickle cell disease and thalassaemia in the UAE. This is followed by a study of normal and abnormal WBC formation and is reinforced by viewing peripheral blood films and patient case studies. Subjects explored include lab diagnosis of systemic and infectious diseases and many haematological malignancies. The diagnostic applications of cell marker analysis, flow cytometry, HLA system and stem cell transplantation will also be discussed.

Prerequisite: HML 2013

**HML 2153 - Histotechnology (1-4-3)**

This course introduces the principles and practices of Anatomic pathology for investigation of disease and its processes, immunohistochemistry and quality assurance systems. Instruction concentrates on safe and good laboratory practices. The course introduces cell injury, tissue preservation, processing, microtomy, recognition and preparation, for diagnosis. Through laboratory practicals, the role of histochemistry in differentiating cellular diseases is clarified. Emphasis is on trouble-shooting methods and advanced techniques for diagnosis.

Prerequisites: HSC 1033 and HSC 1123

**HML 2203 - Clinical Chemistry II (1-4-3)**

Performing a range of manual techniques for clinical chemistry laboratory analysis in addition to introducing automated chemistry analysers to enhance the crucial skills sets required for working in a medical laboratory environment. Students describe and apply the principles of enzymology along with measurement techniques. Students comprehend normal physiology and pathology related to each of the analytes for liver function tests, cardiac enzymes, acid-base balance and hCG.

Prerequisite: HML 2043

**HML 2213 - Clinical Preceptorship I (0-12-3)**

Students under the supervision of professional medical laboratory technologists observe and perform routine and specialized medical laboratory procedures, and analysis of laboratory data. Competence levels in medical laboratory procedures are set at the appropriate standard for third year students and teaching, assessment, and evaluation are reflective of the indicated standard.

Prerequisites: HML 2143, HML 2203, HML 2113 and HML 2153

**HML 3003 - Hemostasis (1-4-3)**

This course covers normal hemostasis and the roles and interactions of the blood vessels and platelets, as well as the coagulation and fibrinolytic systems. The inherited and acquired disorders of hemostasis will be explored and students will carry out the practical tasks needed to differentiate and diagnose these disorders. The causes and clinical effects of thrombosis will be discussed and students will carry out the appropriate laboratory tests involved in the diagnosis and treatment of these disorders.

Prerequisite: HML 2143

**HML 3013 - Parasitology, Virology, Mycology (1-4-3)**

Further identification and clinical correlations of bacteria encountered in clinical specimens follows on from Microbiology II course, mainly blood and body fluids. In addition, the course includes the study of parasitic, viral, fungal infections and their diagnosis. The student assesses and performs, as appropriate, the specimen collection and processing, microscopic, cultural and immunological techniques used in the isolation and identification of fungi and parasites

Prerequisite: HML 2103

**HML 3023 - Cytotechnology (1-4-3)**

Introduces principles of cytopathology to investigate disease processes and safe working practices. Review population screening, collection and preparation of samples, staining cells for diagnosis and recognition. Through practicals, the role of the technologist and histochemistry in differentiating cellular diseases will be understood. Emphasis is placed on trouble-shooting, advanced techniques used in tissue diagnosis, immunohistochemistry and QA systems.

Prerequisite: HML 2153

**HML 3033 - Clinical Biochemistry (1-4-3)**

Advanced topics include lipid metabolism and its relationship to cardiovascular disease; prostate disease; mineral metabolism; thyroid function; introduction to therapeutic drug monitoring; immunoassay methods, and Ion Selective Electrodes. Students examine the inter-relationships of disease and clinical chemistry values along with related analytical techniques. Laboratory exercises complement the concepts covered in the classroom.

Prerequisite: HML 2203

**HML 3043 - Transfusion Medicine (1-4-3)**

Explore antigen-antibody reactions, inheritance and structure of blood group antigens. Reinforce by performing grouping techniques. Donation, screening and processing blood components, as well as testing donors and recipients to ensure safe transfusion are explored. QC and QA are explained to ensure safety of blood products. Learn crossmatching and the detection and identification clinically significant antibodies and possible adverse effects of transfusion and methods to investigate reactions. Study HDNB and how to detect and prevent this condition.

Prerequisite: HSC 1033

**HML 3053 - Laboratory Management (3-1-3)**

Introduce students to the concepts of management in the hospital laboratory, and develop skills essential to quality management: individual performance; collective performance within unit of responsibility; and external stakeholders. Students recognize the requirements for good management, organizational excellence and monitoring to benchmark standards. The course will require students to participate in group work (management teams) and will involve problem-solving and role-playing.

**HML 3103 - Applications in Molecular Diagnostics (3-1-3)**

Introduces a variety of current techniques in molecular biology, with a focus on analysis of nucleic acids: Polymerase chain reaction, gel electrophoresis and blotting techniques, real-time PCR, microarrays, recombinant DNA technology, DNA sequencing and gene function analysis. Manipulation and analysis of gene expression in prokaryotic and eukaryotic systems will be briefly described. Students will become familiar with mechanisms, objectives, applicability and limitations of common wet-lab methods.

**HML 4006 - Clinical Preceptorship II (0-8-6)**

Students under the supervision of professional medical laboratory technologists observe and perform routine and specialised medical laboratory procedures, and analysis of laboratory data. Competence levels in medical laboratory procedures are set at the appropriate standard for third year students and teaching, assessment, and evaluation are reflective of the indicated standard.

Prerequisites: HML 3043, HML 3033, HML 3013, HML 3003 and HML 3023

**HML 4016 - Clinical Correlations (8-1-6)**

Designed to enhance problem solving skills by integrating the various streams of knowledge acquired in Microbiology, Hematology, Clinical Chemistry, Transfusion Science, Immunology and Molecular diagnostics in the context of clinical case studies of patients. Emphasis is on the correlation of the lab data with pathophysiology, diagnosis and treatment of major disease categories. Competencies to be reinforced include leadership, critical thinking, communication, analytical skills, ethical issues, professionalism and the skills to work in a healthcare setting.

**HML 4116 - Clinical Preceptorship III (0-8-6)**

Students under the supervision of professional medical laboratory technologists observe and perform routine and specialised medical laboratory procedures, and analysis of laboratory data. Competence levels in medical laboratory procedures are set at the appropriate standard for third year students and teaching, assessment, and evaluation are reflective of the indicated standard.

Prerequisite: HML 4006

**HML 4123 - Pathology of Diseases (3-1-3)**

Introduces the biological principles of human disease and the transition from health to disease. Synthesizes the biological (Physiological and biochemical) process underlying the clinical manifestations of disease and thereby bringing together material from a variety of sources. The clinical relevance and the laboratory investigation thereof, is stressed by the inclusion of relevant case studies, particularly those prevalent in the region.

Prerequisite: HML 4016

**HNR 2003 - Fundamentals of Nursing (Theory) (3-1-3)**

Introduces the basic concepts and selected theories of nursing, professional nursing standards and the role and scope of the general nurse practice. Explores the concepts of clinical decision making and critical thinking in relation to the application of the nursing process. Focuses on theoretical knowledge and appropriate clinical experience to build up cognitive and practical skills.

Corequisite: HNR 2013

**HNR 2013 - Fundamentals of Nursing (Practice) (0-8-3)**

Provides students with the opportunity to develop and demonstrate foundation clinical nursing competencies. Emphasis is placed on students internalizing and demonstrating safe client care and mastering nursing competencies in the skills lab. Students will apply the nursing process in simulated and supervised clinical settings.

Prerequisites: HSC 1033 and HSC 1113

Corequisite: HNR 2003

**HNR 2014 - History Taking and Physical Assessment (3-4-4)**

Provides theoretical knowledge and essential skills in inspection, palpitation, percussion, and auscultation required for the student to conduct a complete physical health assessment of young and older adults and with severity of illnesses. Knowledge of the normal structure and function of body parts and systems is an essential requisite to conducting physical assessment.

Prerequisite: HSC 1033

**HNR 2022 - Communication and Health Education Skills (2-1-2)**

This course aims to prepare students to effectively communicate with patients, families, and the interprofessional team in various healthcare settings. Models and theories of communication will be explored including tools to prevent communication errors. The course focuses on health education and strategies. Students are expected to deliver health education sessions.

**HNR 2033 - Pathophysiology (3-1-3)**

Introduces pathophysiological processes of body systems affecting human beings across the lifespan. It focuses on understanding health alterations, symptomatology, diagnostic techniques and medical, surgical procedures.

Prerequisite: HSC 1033

**HNR 2102 - Microbiology (2-1-2)**

Provides students with the theoretical and practical techniques in the classification, isolation and identification of micro-organisms. Students study concepts of infection, transmission of disease, pathogenicity, body defense mechanisms, prevention and control of infection.

**HNR 2113 - Clinical Pharmacology (3-1-3)**

Introduces the differences between pharmacology, clinical pharmacology and therapeutics. Basic principles of pharmacokinetics and pharmacodynamics, characteristics of an ideal drug, drug administration routes and dose calculation, legislation, drug development and drug classification, adverse drug reactions and drug interactions will also be explored.

**HNR 2124 - Adult Health Nursing I (Theory) (4-1-4)**

Introduces students to common health conditions of adults. It explores the clinical manifestations, treatment modalities and care management of common health conditions according to body systems. Students apply the nursing process and explore evidence-based guidelines and health informatics relevant to health conditions of patients.

Prerequisites: HNR 2003 and HNR 2014

Corequisite: HNR 2154

**HNR 2143 - Social and Behavioral Sciences for Nursing (3-1-3)**

Provides an overview of human behavior and human development. This course describes the human development process, identifies major concepts of social psychology and relates them to real-life situations. It provides framework for examining human behavior in social systems and in various contexts with emphasis on healthcare contexts.

HNR 2154 - Adult Health Nursing I (Practice) (0-16-4)

An introductory clinical experience course which offers students the opportunity to have supervised hands-on experience in the care management of patients, and the translation of theoretical knowledge into practice. Emphasis is placed on the application of health assessment and the utilization of the nursing process for adults with common health conditions.

Prerequisites: HNR 2003, HNR 2013 and HNR 2014

Corequisite: HNR 2124

**HNR 3023 - Adult Health Nursing II (Theory) (3-1-3)**

Builds upon Adult Health Nursing I (Theory), where students examine health conditions of body systems that affect adult and older adult populations. Clinical manifestations and causes of selected health conditions are explored, as well as the treatment modalities and care management of these conditions.

Prerequisite: HNR 2124

Corequisite: HNR 3033

**HNR 3033 - Adult Health Nursing II (Practice) (12-1-3)**

Builds upon the clinical experience learned in Adult Nursing I (Practice). Students further develop their competency and clinical judgement in planning and managing the care of adults and older adults. Emphasis is on the application of health assessment, utilization of the nursing process and collaboration with the interdisciplinary team.

Prerequisite: HNR 2154

Corequisite: HNR 3023

**HNR 3043 - Maternal Health Nursing and Care of the Newborn (Theory) (3-1-3)**

This course aims to introduce students to basic concepts and principles of nursing care for women before, during and after delivery, the newborn and their families. Students will utilize the nursing process in the provision and promotion of holistic care. Concepts to be explored include normal and abnormal issues during pregnancy, delivery, the postnatal period and the newborn.

Prerequisites: HNR 2003 and HNR 2013

Corequisite: HNR 3052

**HNR 3052 - Maternal Health Nursing and Care of the Newborn (Practice) (0-8-2)**

This course aims at providing nursing students with essential clinical training that would enable them to provide holistic health and nursing care for childbearing family at different stages; antepartum, intrapartum and postpartum. Health promotion and prevention of disease is emphasized. Students will engage in the management of clients undergoing diagnostic/therapeutic procedures; care of the mother and fetus and care of the newborn.

Prerequisites: HNR 2003, HNR 2013 and HNR 2014

Corequisite: HNR 3043

**HNR 3103 - Mental Health Nursing (Theory) (3-1-3)**

This course aims to develop fundamental knowledge, skills and attitudes relevant to the restoration and maintenance of optimal mental health and recovery from mental illness. Students will develop introductory skills integral to the assessment of mental health disorders and the evaluation of coping abilities.

Prerequisites: HNR 2003 and HNR 2013

Corequisite: HNR 3112

**HNR 3112 - Mental Health Nursing (Practice) (0-8-2)**

Students will apply mental health nursing knowledge, including decision making and critical thinking skills, and beginner practitioner skills pertaining to the care and management of individuals with a variety of mental health problems. This course provides the opportunity for students to work with individuals in a mental health care settings.

Prerequisites: HNR 2003 and HNR 2013

Corequisite: HNR 3103

**HNR 3123 - Child and Adolescent Health Nursing (Theory) (3-1-3)**

This course introduces students to appropriate scientific knowledge which enables them to develop their own unique clinical and educational approach to care of children, adolescents and their families. The course progresses from simple to complex concepts, as it moves from normal growth and development to health promotion and maintenance to prevention of illnesses and selected health issues.

Prerequisites: HNR 2003 and HNR 2013

Corequisite: HNR 3133

**HNR 3133 - Child and Adolescent Health Nursing (Practice) (0-12-3)**

This course teaches students essential clinical skills and competencies that enables them to provide holistic health and nursing care for children, adolescents and their families. The aim of the course is to enable students to think critically in providing nursing care to children and adolescents with different health problems through the application of the nursing process. Students will promote health prevention strategies for children and their families.

Prerequisites: HNR 2003, HNR 2013 and HNR 2014

Corequisite: HNR 3123

**HNR 3142 - Ethical and Legal Issues in Nursing (2-1-2)**

This course identifies professional, ethical, and legal principles relevant to the practice of a registered nurse. It provides an opportunity to assess ethical and legal issues confronting nurses and other health care providers in a variety of health care settings. The course will address legal concepts and regulations under which professional nurses practice in UAE.

**HNR 4003 - Management of Individuals with Complex Health Needs (Theory) (3-1-3)**

This course further develops nursing knowledge and critical thinking skills whilst utilizing the nursing process through exploration of common, complex health challenges. Technical, scientific, interpersonal and clinical decision-making skills are also further developed. Students apply concepts and skills related to the care and management of individuals with acute and life threatening conditions.

Prerequisite: HNR 3023

Corequisite: HNR 4033

**HNR 4013 - Community Health Nursing (Theory) (3-1-3)**

This course will enable students to understand community health by exploring theoretical frameworks and health care policies and practices that underpin community health nursing. The course will introduce epidemiology; identify determinants of health and discuss health promotion theories and illness prevention strategies for individuals, families and groups; and, discuss vulnerable populations.

Prerequisites: HNR 2003 and HNR 2013

Corequisite: HNR 4022

**HNR 4022 - Community Health Nursing (Practice) (0-8-2)**

This course will enable students to develop an understanding of community health care nursing. They will develop skills in assessment of an individual and develop rapport with family and community at large. Students will assess physical, sociocultural, environmental factors that influence, individual, families and communities, identify populations at risk and implement and evaluate primary care nursing interventions.

Prerequisites: HNR 3003, HNR 3052 and HNR 3133

Corequisite: HNR 4013

**HNR 4023 - Evidence- Based Practice (3-1-3)**

This course will enable students to apply the critical thinking skills, decision making process, and scientific inquiry to solve clinical problems within the clinical nursing practice areas. Focus is placed on the cyclical process of identifying clinical questions, searching and appraising the evidence for potential solutions/innovations, planning for implementing practice changes, evaluating the outcomes and identifying additional gaps in nursing knowledge.

Prerequisite: LSS 1123

**HNR 4033 - Management of Individuals with Complex Health Needs(Practice) (0-12-3)**

This course will develop clinical reasoning and judgment skills pertinent to perform complex nursing care. The course enriches the educational experience of nursing students by advancing their skills in assessing, communicating with, and managing patients with complex health needs in both, critical care settings and non-critical care settings.

Prerequisites: HNR 3023 and HNR 3033

Corequisite: HNR 4003

**HNR 4113 - Leadership and Quality Management in Nursing (3-1-3)**

This course introduces students to management functions and leadership roles in nursing practice at the unit level. The course addresses selected theories of nursing management and leadership, organizational structure, core management and leadership skills, and organizational aspects of risk, safety and quality, including disaster management.

Corequisite: HNR 4126

**HNR 4122 - Nursing Informatics (2-1-2)**

Nursing Informatics focuses on the use and management of nursing information to enhance, facilitate and guide nursing knowledge and practice. It introduces students to important informatics tools that are currently utilized in healthcare to ensure safe and quality nursing care and explores the role of information technology tools in shaping nursing knowledge, practice, and research.

**HNR 4126 - Consolidated Nursing Practice (0-24-6)**

This course is the final clinical experience for nursing students before graduating and being able to function as registered general nurses. This clinical experience will enable students to consolidate the knowledge and skills gained throughout the program in both the clinical and theory courses to effectively prepare them for their future role as registered professional nurses. To establish the student's suitability for employment and future licensure as a Registered Nurse they will be required to pass clinically focused exit exam during this placement.

Prerequisites: HNR 3023, HNR 3033, HNR 3103, HNR 3112, HNR 3043, HNR 3052, HNR 3133, HNR 4003, HNR 4013, HNR 4033 and HNR 4022

Corequisite: HNR 4113

**HPH 1503 - Introduction to Pharmacy (2-2-3)**

This course outlines the history and evolution of pharmacy to current practice areas, drug sources and stages of development of drug products from source to final dosage form, drug classification, nomenclature, legislation, routes of administration and dosage forms, reading, interpretation, evaluation and process of prescriptions and labels for dispensing, patient counselling.

**HPH 2003 - Biological Organic Chemistry (3-1-3)**

Provides opportunities to develop the knowledge and analytical skills required to correlate between the structure and reactivity of alkanes, alkenes, alkynes, cyclo/aromatic hydrocarbons, alcohols, phenols, thiols, ethers, aldehydes, carboxylic acids, esters, amines and amides; molecular properties and physiological roles of carbohydrates, amino acids-proteins-enzymes-co-enzymes and co-factors; nucleic acids and lipids; cycles of transformation of matter and energy production; biochemical basis of biological functions and specific disorders.

Prerequisite: HSC 1023

**HPH 2016 - General Pharmacology (6-1-6)**

Introduces the basic principles of pharmacokinetics and pharmacodynamics, the effect of physical-chemical properties of drugs, dosage forms and the route of administration on the rate and extent of drug absorption; drug therapy in high risk groups; neurotransmission, chemical mediators which cultivates students' knowledge in drug site targets through the pharmacology of the autonomic nervous system

Prerequisite: HSC 1033

**HPH 2023 - Pharmaceutics I (3-1-3)**

Emphasis is put on the development of fundamental knowledge, skills and competencies required to problem solving in pharmacy. Topics include physical-chemical concepts of the 3 states of the matter; fundamental pharmaceutical calculations; dose calculations based on general considerations and patient parameters; theory and practice of basic practical pharmaceutics.

HPH 2034 - Community Pharmacy Preceptorship (0-16-4)

The Introductory Pharmacy Practice Experiences, in a community pharmacy setting, are designed to provide the student with a fundamental understanding and appreciation of pharmacy practice. It provides opportunities to engage in basic distributive and administrative processes in community pharmacies and gain initial experience interacting directly with patients, preceptors, technicians, and other health care providers and pharmacy personnel

Prerequisite: HPH 1503

**HPH 2113 - Systems Pharmacology (3-1-3)**

Provides opportunities to develop the knowledge and ability to integrate essential therapeutics decision making competencies and pharmacological concepts. Emphasis is put on the therapeutic rationale and selection of drugs for specific disorders complimented by the general use of prototype drugs, their actions, pharmacokinetics and adverse effects. Major topics include disorders associated with allergies, inflammation, pain, and musculoskeletal disease.

Prerequisite: HPH 2016

**HPH 2123 - Microbiology and Immunology (3-1-3)**

Topics include the concepts, prevention and control of infection, pathogenicity, body defense mechanisms, the nature of microorganisms and their roles in causing disease and spoilage of pharmaceuticals; microbiological lab procedures and assays, resistance to antimicrobials; aseptic/sterile processing; preservation of pharmaceutical products; clean rooms; GMP sterile manufacture; fundamental immunological principles, non-specific and specific immunity, vaccination; disorders related to excessive or abnormal immune responses; principles of immunotherapy.

Prerequisite: HSC 1033

**HPH 2133 - Pharmaceutics II (3-1-3)**

Development of knowledge, skills and competencies to (a) energetics of chemical and physical processes; (b) interpretation of the properties of solutions; (c) disperse systems (d) pre-formulation, formulation, packaging, labelling and presentation procedures of pharmaceutical solutions.

Prerequisite: HPH 2023

**HPH 2144 - Clinical Pharmacy Preceptorship I (0-16-4)**

Facilitates experience in providing patient-centred pharmaceutical care mainly in ambulatory care settings. It develops competencies and fundamental skills in medication therapy and medication management, in addition to learning effective professional communication skills in conjunction with prescribing physicians and third party payers to manage medication-related problems. Students also apply integrate basic pharmacy-related concepts to ambulatory patient care as a member of an interdisciplinary health care team.

Prerequisite: HPH 2034

**HPH 2153 - Medicinal Chemistry I (3-1-3)**

Development of knowledge, skills and competencies which empower to apply fundamental concepts of molecular properties of drugs to biopharmaceutical features (solubility, absorption, distribution, drug binding interactions, biotransformation and elimination). Prerequisite: HPH 2003

**HPH 3006 - Pathophysiology and Therapeutics I (6-1-6)**

Advances essential knowledge required to make judgments in regards to the effects, therapeutic rationale and selection of drugs for specific disorders. Topics include: disorders of the gastrointestinal system, Neurological and Psychiatric associated diseases and disorders of respiratory systems, renal and hepatic system.

Prerequisite: HPH 2113

**HPH 3043 - Medicinal Chemistry II (3-1-3)**

Explores the effect of stereospecific/selective properties on drug action; the phases, technologies and methods of discovery, design and development; concepts of rational drug design to create analogs of a specific drug molecule; structure and function and pharmacodynamics of drug targets and the integration of the pharmaceutical, pharmacokinetic, and pharmacodynamic phases of drug action.

Prerequisite: HPH 2153

**HPH 3054 - Pharmaceutics III (3-2-4)**

Highlights important pharmaceutical/biopharmaceutical and mathematical principles which are essential to product design, development, presentation and testing of liquid, semi-solid and solid pharmaceutical dosage forms. The laboratory components help students to develop practical capabilities in compounding, packaging and testing dosage forms that are directly applicable to the manufacturing procedures of pharmaceuticals.

Prerequisite: HPH 2133

**HPH 3133 - Clinical Biochemistry and Toxicology (2-2-3)**

Develops an in-depth knowledge of interpretation of clinical laboratory investigations of body fluids, and the correlation of these results to biochemical changes associated with specified disorders. The course also focuses on the application of basic toxicological principles to an initial approach for the management of a poisoned patient; assessment of the degree of toxicity of selected therapeutic and non-therapeutic agents; followed by possible treatment strategies.

Prerequisite: HPH 3043

**HPH 3143 - Pharmaceutical Analysis (3-1-3)**

Covers the theory and practice of wet chemical, spectroscopic and chromatographic methods of modern pharmaceutical analysis; the control of quality during drug analysis (pharmacopoeia standards, instrumentation, reagents, limit test, standard solutions, sampling, calculations of results and errors, and general operations); statistical treatment and interpretation of experimental data; assays based upon knowledge of general, special, physical, and chemical concepts of analytical chemical procedures.

Prerequisite: HPH 3043

**HPH 3154 - Clinical Pharmacy Preceptorship II (0-16-4)**

Students will interact with a number of different healthcare providers and participate in a variety of patient care activities with the pharmacy preceptor and medical teams. The student will be provided with many opportunities to apply her academic basic science and clinical didactic course work to acute patient care in the hospital setting.

Prerequisite: HPH 2144

**HPH 3163 - Pathophysiology and Therapeutics II (3-1-3)**

The focus is on pathophysiology and applied therapeutics of common chronic and acute cardiovascular conditions, including Hypertension, Heart Failure, Ischemic Heart Disease, Atherosclerosis and Vascular Obstructive Disease, Angina Pectoris, Myocardial Infarction, Acute Coronary Syndrome, Diabetes and Thyroid disease. The role of evidence-based medicine in determining therapeutic decisions is emphasised, and builds upon the basic pharmacological and pharmaceutical sciences.

Prerequisite: HPH 3006

**HPH 4003 - Bio-Technology (3-1-3)**

Enhances the knowledge and understanding of major bio-technology techniques which include rDNA, Hybridoma Technology (Monoclonal Antibodies), Antisense Technology, PCR, Genomics, Proteomics, Gene Therapy, Transgenics, Glycobiology, Cloning, Peptidomimetics and specific preformulation procedures. Familiarises students with parenteral, oral and specialised delivery procedures of biotech products and the impact of biotechnology on pharmaceutical care.

Prerequisite: HPH 4033

**HPH 4013 - Complementary Medicine (3-1-3)**

Develops the role of the pharmacist in providing medication therapy management services focused upon the safe, appropriate, and effective selection, use, and monitoring of non-prescription, herbal, nutritional and other alternative/complementary medication therapies as well as prevention of health risks and fostering a healthy lifestyle.

Prerequisite: HPH 3163

**HPH 4033 - Pharmaceutical Care Practice Skills (2-2-3)**

Extends students concepts, principles and functions of the general framework and the systematic method for the process and application of pharmaceutical care, critical thinking and problem-solving skills. The course requires students to assess, resolve and monitor patients drug-therapy needs and problems with a commitment to improving patient treatment outcomes.

Prerequisite: HPH 3154

**HPH 4042 - Industrial Pharmacy Preceptorship (0-8-2)**

Generates student knowledge in various activities of the drug manufacturing industry, such as research and development, manufacturing, quality control, clinical testing, information support, marketing, and regulatory affairs. This course provides opportunities where the student can learn about responsibilities of the industrial pharmacist and also about the variety of career opportunities in the pharmaceutical industry. Students with an interest in an industrial pharmacy career can use this rotation opportunity to explore, focus and refine their career goals

Prerequisite: HPH 3054

**HPH 4073 - Pathophysiology and Therapeutics III (3-1-3)**

Introduces students to the main concepts of pathophysiology and principles of antimicrobial chemotherapy, antineoplastic and immunomodulating drugs. Students apply the appropriate therapeutic management of infectious liver and gastrointestinal tract diseases based on the pharmacological features of drug entities.

Prerequisite: HPH 3163

**HPH 4103 - Pharmacy Law, Ethics and Pharmacoeconomics (2-2-3)**

Application of UAE pharmacy laws and regulations to the preparation and distribution of medications and patient counseling activities; Concepts of monitoring the practice site, and/or service area for compliance with UAE laws, regulations and professional standards. Ethical conduct in all job-related activities to maintain confidentiality of patient and proprietary business information, application of basic principles of pharmacoeconomics to pharmacy practice

Prerequisite: HPH 4033

**HPH 4114 - Advanced Pharmacy Practice (0-16-4)**

Advanced practice experience aids the student in applying their integrated knowledge, skills and competences previously learnt in formal coursework toward the practice of pharmacy in Direct Patient Care (Acute/Primary Care; Ambulatory Care; Community Pharmacy) and in Indirect Patient Care (Health System Management and Community Management). Other experiences are chosen as electives from specialty pharmacy experience. Emphasis is placed on the consolidation of student's ability to function as a competent pharmacist practitioner.

Prerequisite: HPH 3154

**HRM 2003 - Professional Practice in Human Resource (3-1-3)**

Provides students with foundation knowledge of Human Resource Management (HRM) processes and strategies in organisations. Specifically, the course introduces the various HRM theories and models which explain the nature and significance of key HRM practices and HRM outcomes in organisations. In addition it examines the changing role of the human resource professional as a strategic partner in managing today's organisations. Key functions such as recruitment, selection, development, appraisal, retention, compensation, and labour relations are discussed.

**HRM 2103 - Recruitment and Selection (3-1-3)**

Covers the knowledge and skills needed for HR practitioners in the recruitment and selection process related to human resource management. It emphasises the importance of the recruitment and selection plan in achieving organisational goals and objectives. Discusses the different selection tools and techniques available and analyses the issues and challenges in the recruitment and selection of foreign and local employees.

Prerequisite: HRM 2003

**HRM 3003 - Performance Management (3-1-3)**

Explore performance management practices from a theoretical and practical perspectives. It also explore how performance management systems are designed and implemented in organizations and evaluate key aspects of effective performance management systems and tools as well as examine contemporary approaches and practices of performance management in a global competitive environment.

Prerequisite: HRM 2003

**HRM 3013 - Organisational Change Management (3-1-3)**

Examines ways to implement and manage organization change and innovation by using modern techniques to plan and implement change and innovation. It provides an integrated approach to the theory and practice of organisational change. It particularly involves learning the processes in managing and leading change within the theoretical frameworks of organisational culture, power, politics, and leadership. The course will also consider the design and implementation of effective interventions specifically focused on developing HR related skills

Prerequisite: MGT 2103

**HRM 3103 - Training and Development (3-1-3)**

Students will develop the proficiency to assess the role of training and development in maintaining a motivated and up to date workforce. Students will compare the way the training and development function is structured in different organisations and will explore the training delivery techniques used in different training programs. The students will learn to develop, deliver and evaluate training programs.

Prerequisite: HRM 2003

**HRM 3113 - Career Development and Planning (3-1-3)**

This course will include the discussion of the concepts related to mentoring, coaching, replacement charts, skill inventories, career paths, succession planning, position analysis questionnaires, and career development strategies related to plateaued staff. It contributes to the development of essential human resource management skills.

Prerequisite: HRM 2003

**HRM 4003 - Employee Relations and UAE Labour Law (3-1-3)**

International and local rules and practices will be compared for better understanding of employment-related dispute settlement, and policies and procedures related to the administration of employee benefits and possible labour violations. Employment contracts for commercial enterprises in the UAE will be drafted and collective labour relations will be analysed.

Prerequisite: LAW 3103

**HRM 4013 - Compensations and Benefits (3-1-3)**

Examines the human resource dimensions of organisational compensation and benefits programs and prepares the students to evaluate compensation and benefits decision making in an organisation. Students will be exposed to contemporary compensation and benefits practices to help them develop required proficiencies.

Prerequisite: HRM 3003

**HRM 4023 - Resourcing and Talent Planning (3-1-3)**

Introduces the key operational tools, techniques and practices that companies use to resource their organisations effectively. These include recruitment, selection, workforce planning, staff retention, succession planning, retirement and dismissal processes. The main focus of the course is on the role of HR management towards workforce mobilization so that the organisation has the access skills it needs to drive sustained performance.

Prerequisite: HRM 2003

**HRM 4033 - Managing Communications and Emotional Intelligence for HRM (3-1-3)**

Deals with ways to develop effective communication in organisations by understanding communication processes and the best practice in organisational communication. Communication theory, interpersonal communication, emotional intelligence and perception, the importance of intercultural communication, body language and nonverbal communication, crises communication and strategies for improving communication are covered in this course.

Prerequisite: MGT 2103

**HRM 4043 - Occupational Health and Safety (3-1-3)**

Students will be able to recognize and assess the hazards and risks in the workplace and formulate prevention action programs to be applied in the workplace. The main focus is on the integration of health and safety within the framework of human resources management and on equipping students with the knowledge and tools for incorporating the health and safety practices into the human resources policy and procedures.

Prerequisite: HRM 2003

**HRM 4053 - Organization Design and Development (3-1-3)**

Organizational design and development is focused on providing students with an understanding of various theories and models that contribute in designing agile and adaptable organizations to achieve sustainable performance by shaping and aligning organizational strategy with its structures, size, systems, process, people, culture and communication.

Prerequisite: HRM 3103

**HRM 4103 - International Human Resource Management (3-1-3)**

Develops learners' skills to analyse the implications of internationalisation and globalization of HRM. Learners are trained to distinguish between domestic and international HRM, and to recognise the challenges associated with managing the workforce in foreign locations.

Prerequisite: HRM 4003

**HRM 4113 - Negotiation and Workplace Dispute Resolution (3-1-3)**

Students will explore the reasons for workplace conflict and compare the types of dispute resolution procedures that are used in both union and non-union workplaces. They will analyse and compare international and local rules and practices for better understanding of possible labour violations and employment-related dispute settlement. Students will analyse issues in individual and collective labour relations and develop a practical approach to dispute resolution.

Prerequisite: HRM 4003

**HRM 4123 - Employee Development through Coaching and Mentoring (3-1-3)**

Students will explore various theoretical concepts and practical approaches in the use of coaching and mentoring in the overall development of employees in the organisation. It shall also look into the role of line managers as coaches and mentors to employees in the organisation. Students are expected to be able to plan, design, and analyse the efficiency and effectiveness of various coaching and mentoring interventions in the context of local and or international organisations in the UAE.

Prerequisite: HRM 3103

**HRM 4133 - Managing Diversity and Inclusion (3-1-3)**

Examines the importance of a diverse workforce in an organisation and how this can be upheld as a core competency in building a productive work environment. Theories, policies and practices of diversity management in the workplace will be introduced and discussed.

Prerequisite: MGT 2103

**HRM 4143 - Strategic HRM and HR Analytics (3-1-3)**

Providing students with a critical understanding of the theories, principles, current issues and practices relevant to human resource management strategy. Strategic HRM course enables students to take a critical view of core strategies for maintaining equity and diversity in the workplace, including of ethical decision-making approaches and best practices in the region for attracting, retaining and developing employees and management from a strategic perspective.

Prerequisite: MGT 3103

**HRM 4153 - HRM Information Systems (3-1-3)**

This course covers two major aspects of business management that affects the competitive advantage of companies: human resources and information systems. The course uses HRIS including basic concepts and advantages of HRIS with futuristic vision. The course develops the skills to understand HRIS customers, need analysis for HRIS and design HRIS architecture. Students will learn to analyse HR metrics and generate appropriate business reports reflecting cost-benefit analysis and the effect on business outcomes.

Prerequisite: BIS 3003

**HRM 4203 - HRM Research Project (3-1-3)**

Provides students with the resources to apply the research skills from previous courses as a framework for a final industry-based research project for the Human Resources major. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment. The final semester research project should be informed and supported where possible by industry in order to provide a high level of authentic learning.

**HSC 1013 - Human Biology (2-2-3)**

Introducing the basic concepts of Human Biology by offering the student an insight and understanding of the interrelationships of the various parts of the human body. It provides a foundation for further related and more specialized studies.

**HSC 1023 - Chemistry for Health Sciences (2-2-3)**

This introductory course will discuss fundamental principles of Chemistry basic to the understanding of the health related interdisciplinary sciences. Topics include the classification of materials, subatomic and atomic properties, structure and chemical bonding, chemical nomenclature, chemical quantities and reactions and the analysis of the properties of solutions. A chemistry lab is included to reinforce the major theoretical concepts learned.

**HSC 1033 - Anatomy and Physiology (2-2-3)**

Designed to build upon concepts covered in the Human Biology course. The aim is to extend the students understanding of the workings of the body systems and the communication processes required to coordinate their activities. Topics covered will be the structure and function of the following systems: endocrine, nervous, integumentary, cardiovascular and respiratory, immune, urinary and reproductive. A laboratory component will allow students to explore anatomical and physiological concepts through a range of laboratory based activities.

Prerequisite: HSC 1013 or HSC 1103 or LSN 1103

**HSC 1113 - Introduction to Healthcare Systems and Professional Practice (3-1-3)**

Explores the essentials of health. It lays a solid foundation for all Health Sciences programs offered at HCT. It identifies the core concepts in healthcare delivery within the UAE and covers legal and ethical matters as they relate to healthcare delivery. The roles and responsibilities of various health professionals are analyzed, and current and emerging health challenges for the 21st century are identified.

**HSC 1123 - Work Health and Safety (3-1-3)**

Introduces health sciences students in their first year of study to concepts related to health and safety practices in the work place. It identifies the common workplace hazards and risks and highlights the major principles of controlling, preventing and managing hazards and risks in the workplace with emphasis on health care settings.

**HSC 1233 - Human Growth and Development (3-1-3)**

Examines human growth and development across the life span. Studies growth and development with an emphasis on biological development, health and health promotion. Explores health choices and health issues.

**HSC 1803 - Medical Terminology for Health Sciences (3-1-3)**

Covers basic medical terminology beginning with prefixes, suffixes and word roots used in medical and health care language. Develops knowledge by identifying, analysing, defining, spelling and pronouncing terms and learning abbreviations related to each of the body systems, as well as the basic introductory principles of drug administration routes and drug classifications.

**HSC 2203 - Psychology (3-1-3)**

Psychology is the scientific study of the human mind and behaviour. This course aims to provide an overview of the field of psychology to enable students to gain functional understanding of the human mind and behavior, and apply this knowledge to their field of work.

**HSC 4003 - Research Methods for Health Sciences (3-1-3)**

Develops an understanding of the process of scientific inquiry. Quantitative and qualitative methods are covered. Emphasis is on developing a critical scientific approach to evaluating scientific literature, developing a research proposal and data collection tool. It includes the application of developed theoretical background to a capstone research project in HSC 3006.

**HSC 4006 - Capstone Research Project for Health Sciences (2-8-6)**

Provides an opportunity to perform a research project relevant to their Health Sciences programs. Utilise the research proposal developed to produce an extensive literature review, select appropriate methodology, collect and analyse data and present conclusions in a final capstone report and presentation.

Prerequisite: HSC 4003

**HSW 1003 - Introduction to Social Work (3-1-3)**

Introduction to values, ethics, history and theory central to social work practice. An understanding of social work methods applicable to systems of all sizes within the framework of a person in environment perspective is developed. Social work roles and career paths are also introduced and discussed.

**HSW 1023 - Basic Counselling Skills (3-1-3)**

Introduces the basic techniques required for effective communication and interviewing. Topics include: active listening skills; questioning and interviewing skills; empathy; the influence of culture on communication; and the importance of self-awareness. Develops skills in analysing communication events, through observation or involvement, and implementation of behaviours for successful responses.

**HSW 1033 - Social Diversity and Justice (3-1-3)**

Focuses on issues of diversity, oppression and social justice. Techniques to identify social justice issues as well as skills to successfully intervene with clients experiencing such issues are developed. Impact of diversity on client populations to include identification of strengths are explored. Opportunities for reflection on individual values, beliefs and behaviours towards diversity are provided.

**HSW 1223 - Social Work Practice I: Assessment and Documentation (3-1-3)**

Applies theories and concepts used in social work and child protection. Develops skills of engagement, assessment and documentation, goal and intervention planning, and evaluation.

Prerequisite: HSW 1023

**HSW 1233 - Social Work and Child Protection in the UAE (3-1-3)**

Provides students with an opportunity to explore social work and child protection within the unique cultural context of the UAE. It includes a discussion of common problem-solving approaches of UAE children and families. Introduces culturally relevant social work and child protection problem solving and interventions.

Prerequisite: HSW 1003

**HSW 1313 - Human Behavior in the Social Environment I - Children and Adolescents (3-1-3)**

Explores the interaction between development, behavior and the environment during developmental stages of infancy through adolescence. Knowledge and application of theories that provide understanding of biological, psychological, cultural and social systems on development will be examined.

**HSW 2013 - Vulnerable Populations: Children and Families (3-1-3)**

Applies knowledge and skills gained in earlier social work courses to specific populations. Increases knowledge of dynamics and risk factors unique to families and children. Applies multicultural practice perspectives to specific cases and uses theory to guide practice interventions.

**HSW 2033 - Laws and Ethics in Social Work in the UAE (3-1-3)**

Develops an increased understanding of the values and ethics that shape social work practice. Develops skills in recognizing ethical issues and applying an ethical legal framework to guide practice decisions and enhance use of critical thinking skills. Attention is given to the International Social Work Code of Ethics as well as other ethical frameworks and their application to UAE social work practice.

Prerequisite: HSW 1033

**HSW 2133 - Social Work with Families (3-1-3)**

Utilises family theories and models to explore family structure, dynamics and interactions. Structural, communication and behavioural approaches to family interventions as well as continued emphasis on the problem solving approach are presented and applied as culturally relevant models.

Prerequisite: HSW 1023

**HSW 2143 - Social Work Practice II: Advanced Communication and Counseling (3-1-3)**

Emphasizes the intervention and evaluation phases of social work generalist practice. Students gain knowledge, skills and values of methods of intervention and evaluation for application in diverse environments. A reflective approach to practice will be emphasized. Prerequisites: HSW 1023 and HSW 1223

**HSW 2323 - Vulnerable Populations: Children and Adults with Disabilities (3-1-3)**

Extends and applies knowledge and skills gained in earlier Social Work courses to specific populations. Increases knowledge of dynamics and risk factors unique to persons with disabilities. Applies theories such as systems theory to case examples and as a way to guide practice interventions.

**HSW 2324 - Child Protection Field Work Education (4-16-4)**

Provides opportunities for professional social work practice with an emphasis on child protection. Students utilize social work knowledge, skills, theories, ethics and behaviors in a college-approved, human service agency. Integration seminars emphasize ethical practice, problem solving and reflection.

**HSW 3013 - Social Work Practice III: Interventions and Case Management (3-1-3)**

Builds on knowledge and skills learned in Social Work Practice I and II. Students will learn how to both select and apply intervention theories and methods in working with culturally diverse populations and contexts. The application of practice models will be emphasized throughout.

Prerequisites: HSW 1223 and HSW 2143

**HSW 3023 - Human Behavior in the Social Environment II (3-1-3)**

Explores the interaction between development, behavior and the environment during young, middle and older adulthood. Knowledge and application of theories that provide understanding of biological, psychological, cultural and social systems on adult functioning will be examined.

Prerequisite: HSW 1313

**HSW 3033 - Advanced Group Work (3-1-3)**

Expands knowledge of social group work, mutual aid and mezzo level practice. Building on knowledge of group development, dynamics and processes, students will apply knowledge and skills to development of a mutual aid group. The impact of diversity on group dynamics and processes are discussed and explored.

Prerequisite: HSW 3103

**HSW 3103 - Social Work with Groups (3-1-3)**

Introduces social group work. Develops skills needed to work with different kinds of groups and differentiates the social worker's roles and responsibilities with each. Explores group development, stages, dynamics, processes and skills needed to advance the goals of individual members and group as whole.

Prerequisite: HSW 1023

**HSW 3223 - Social Work Action and Advocacy (3-1-3)**

Builds on micro, mezzo and macro practice skills needed to work with systems of all sizes. Develops strategies and techniques to ethically advocate for options, services, resources and resource development. Particular emphasis will be given to social work tools of advocacy, negotiation, brokering and mediation as ways to promote planned change with and on behalf of clients.

Prerequisite: HSW 2033

**HSW 3943 - Social Work Field Work Education II (3-12-3)**

Extends social work knowledge and skills through placement in a human service agency. Students use theories, ethics in practice settings. Weekly integration seminars emphasize ethical practice, problem solving efforts and reflection.

Prerequisite: HSW 2324

**HSW 4013 - Research Methodologies for Social Work (3-1-3)**

Introduces the importance of evidence based practice to evaluate and inform social work. Develops knowledge of scientific processes and methods involved in research, as well as an understanding of research related concepts, terms and theory. Opportunities to create a research proposal are provided.

**HSW 4033 - Social Policy and Social Development (3-1-3)**

Provides an examination of UAE social policy process. Considers UAE social policy as it relates to vulnerable populations and social well-being. Explores emerging trends and problems of UAE society and methods to advocate and/or evaluate policies to address issues.

Prerequisites: HSW 2033 and HSW 3223

**HSW 4216 - Capstone Research Project (2-8-6)**

Provides an opportunity to study UAE social problems, or problem interventions or some aspect of UAE social policy and their impact on client issues. Students select an area of interest, choose methodology, collect, analyse data and present conclusions.

Prerequisite: HSW 4013

**HSW 4223 - Social Work Administration (3-1-3)**

Builds on mezzo and macro level knowledge necessary for social workers to successfully work in and provide leadership to their agency/organisational settings. Knowledge of social agency structures, roles and functions of administrators and ability to analyse the impact of social welfare policy, funding, agency mission and structure on service delivery are further developed.

**HSW 4233 - International Social Work (3-1-3)**

Explores the historical development and current trends in the field of international social work. Ability to analyze the role of the United Nations and its impact on international social work is developed. Explores other international agencies and current roles for social workers in these organizations. Impact of social policy on international agencies is emphasized within a systems context.

**HSW 4243 - Psychological Health and Issues (3-1-3)**

Applies psychological theory to mental health and wellbeing. Examines treatment paradigms of mental health and behavioral disorders and provides opportunities for knowledge and application of theoretical approaches to wellbeing, prevention, diagnosis and treatment. Application of skills to locate and use major classification systems for mental health and behavioral disorders will also be provided.

Prerequisite: HSC 2203 or LSS 2203

**HSW 4303 - Social Work with Communities (3-1-3)**

Extends knowledge of community practice and organisational models. Provides knowledge to analyse techniques and strategies needed to successfully conduct community needs assessments, utilize effective communication skills, and apply frameworks to analyze community problems.

Prerequisite: HSW 3223

**HSW 4927 - Social Work Field Work Education III (7-28-7)**

Integration of social work knowledge and skills through practice in a human-service organization. Students use knowledge, skills, theories, ethics and values in practice settings. Integration seminars emphasize ethical practice, problem-solving efforts and reflection.

Prerequisites: HSW 2324 and HSW 3943

**ICT 2013 - Computational Thinking and Coding (3-1-3)**

Developing fundamental computer programming knowledge and skills through applying logical thinking and problem-solving techniques. Designing and writing computer programs using a high-level programming language. Covering the concepts and techniques of variables, data types, algorithm, sequence, selection, iteration, classes, objects, methods and the processes of running, testing and debugging computer programs. Students will apply their programming skills to a problem from their major or concentration.

**IET 2003 - Introduction to Industrial Engineering (2-2-3)**

Introduces fundamental study areas of industrial engineering and the industrial engineering profession in relation to other disciplines.

**IET 2103 - Technology Innovation and Integration (3-1-3)**

Provides the foundation for automatically capturing data in a system. Topics include automatic identification and data capture systems including bar codes, radio frequency identification, smart cards, biometrics, and the integration of these technologies in problem solving.

**IET 2213 - Work Measurement and Ergonomics (2-2-3)**

Introduces motion and time study tools and techniques used to map and improve industrial and service processes, human capabilities, job requirements, and tool and workstation design.

**IET 2223 - Quality Control (2-3-3)**

Introduces basic concepts of quality engineering and management with a focus on statistical quality control using control charts, capability analysis and acceptance sampling.

Prerequisite: MTH 1113

**IET 2233 - Introduction to Maintenance Management (3-1-3)**

Introduces concepts and methods maintenance management with a focus on building corrective, preventive and predictive maintenance programs. Topics include maintainability, maintenance planning and scheduling, spare parts inventory management, total productive maintenance and performance evaluation.

**IET 2413 - Manufacturing Technologies and Materials (3-1-3)**

Introduces mechanical properties of materials (metals, polymers, ceramics and composites) and manufacturing technologies (casting, forging, extrusion, drawing, machining and joining) used to process materials.

**IET 2421 - Engineering Measurements Lab (0-3-1)**

Introduces measurement methods and techniques for linear, angular, surface, pressure, temperature, force, and strain-related measurements.

**IET 2902 - Sophomore Design Project (1-2-2)**

Perform all aspects of an industrial engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisite: IET 2003

**IET 3203 - Operations Management (2-2-3)**

Introduces capacity planning and line balancing, demand forecasting, inventory models, material requirement planning (MRP) and scheduling.

Prerequisite: IET 2003

**IET 3213 - Lean Thinking and Six Sigma (2-2-3)**

Introduces fundamental principles of lean thinking and six sigma methodologies for industry and service organizations. Focus is on the creation of value through the sustainable elimination of waste to improve quality, productivity and work environment.

Prerequisites: IET 2223 and IET 2213

**IET 3233 - Facilities Planning and Material Handling (2-2-3)**

Introduces empirical and analytical approaches for flow analysis, space requirements, facility layout, material handling, and warehouse functions and design.

Prerequisite: IET 2213

**IET 3303 - Operations Research (3-1-3)**

Introduces principles of formulating and solving linear programming models analytically and using software tools for applications in production, logistics, and project management (transportation, transshipment, assignment, and network models).

Prerequisite: MTH 1203

**IET 3313 - Applied Engineering Statistics (3-1-3)**

Provides review of hypotheses testing, simple linear regression, multiple linear regressions, and matrix approach to multiple linear regressions. Covers single factor analysis of variables, multi-factor analysis of variables, design of experiments, randomized block design, and non-parametric statistics. Includes practical sessions on engineering applications using software packages (SAS, SPSS, Minitab, etc. ...).

Prerequisite: MTH 1113

**IET 3613 - Financial Analysis and Cost Accounting (3-1-3)**

Introduces concepts and methods for costing products and services. Topics include cost concepts and classifications, job costing, activity-based costing, process costing, cost-volume-profit analysis, financial statements and evaluation of financial performance.

**IET 4103 - Enterprise Information Management (2-2-3)**

Introduces the basics of information sharing and security, data networks, database design and website development for industrial and service applications.

Prerequisite: IET 3203

**IET 4113 - Energy Science and Technology (3-1-3)**

Introduces conventional and renewable energy technologies, energy sources, production and uses, energy systems, storage and transport, conservation of energy and the future of energy.

**IET 4133 - Managerial Accounting (3-1-3)**

Introduces business-management approach to use accounting information for internal reporting and decision-making is crucial in developing managerial skills. Covers major topics of managerial accounting including profit planning and control measures. Provides in-depth knowledge in cost accounting by focusing on its role in internal reporting and the resulting decision making processes contributes to the development of analytical skills. Includes basic costing systems, pricing and profitability concepts and principles, cost allocations, product quality, and investment decisions.

Prerequisite: IET 3613

**IET 4203 - Decision and Risk Analysis (2-2-3)**

Introduces principles of decision making under certainty and under risk. Topics include single and multiple criteria decision models, decision trees and influence diagrams, and Bayesian decision models.

Prerequisite: IET 3303

**IET 4223 - Human Resource Management (3-1-3)**

Introduces to principles of human resource management. Topics include skill assessment, recruiting, training, developing and retaining employees, employee health, safety, rights, privacy, security and evaluation and reward systems, employee and labor relations, compensation, and performance evaluation.

**IET 4233 - Service Systems Engineering (3-1-3)**

Introduces the application of industrial engineering methods to the analysis and improvement of services including healthcare, education and government services.

Prerequisite: IET 2003

**IET 4243 - Total Quality Management (3-1-3)**

Introduces the fundamental principles and tools of total quality management (TQM). Topics include customers' focus, leadership, strategic planning, human resource practices, performance measures and quality improvement tools.

Prerequisite: IET 2223

**IET 4303 - Queuing Theory and Process Simulation (2-2-3)**

Introduces principles of building and analyzing waiting line models in production and services using queuing theory and discrete event simulation.

Prerequisites: IET 3303 and IET 3313

**IET 4383 - Performance Management (3-1-3)**

Compare traditional and contemporary approaches to performance management in order to develop an important area of knowledge in human resource management. Learning about the design and implementation of performance management systems, and the role of compensation, incentives and rewards in performance management contributes to vital HR skills.

**IET 4403 - Industrial Robotics (3-1-3)**

Introduce usage of robotics applications in industry, robotic systems. Sensors and actuators, and robot programming and control. Prerequisite: IET 3233

**IET 4413 - Computer Integrated Manufacturing (3-1-3)**

Provides review of computer technology in manufacturing systems. Topics include Computer Numeric Control (CNC), Computer Aided Manufacturing (CAM), Programmable Logic Control (PLC), Automated Guided Vehicles (AGV) and Automated Storage and Retrieval Systems (AS/RS).

Prerequisite: IET 2413

**IET 4503 - Introduction to Marketing (3-1-3)**

Introduces current theories and concepts of marketing. Topics include marketing environment, consumer behavior, market segmentation, product concept, promotion, integrated marketing communication, pricing, distribution channels and strategic marketing.

**IET 4513 - Purchasing and Contract Management (3-1-3)**

Examines the processes by which goods and services are acquired through purchasing and contract management. Topics include procurement, contract strategies, source selection, identifying contract type, product liability and risk, the bid process and response evaluation; contract risk assessment, contract negotiation, and contract law.

**IET 4523 - Warehouse and Inventory Management (3-1-3)**

Provides review of types of warehouses, methods of organizing the warehouse environment, and determining efficient inventory control procedures. Covers technology applications related to the management of warehouse and inventory stock keeping units (SKU) are investigated. Storage of inventory, placement of inventory, picking, packing, shipping, and other internal logistics management topics will be explored.

**IET 4553 - Manufacturing in Supply Chain (3-1-3)**

Introduces manufacturing and supply chain dynamic interaction. Covers common manufacturing systems, methods of manufacturing planning and control is essential to effectively evaluate the supply chain, manufacturing decisions; supplier service and customer service levels. Includes manufacturing decision-making models in the development of solutions to overcome supply chain challenges.

**IET 4563 - Supply Chain Strategy and Management (3-1-3)**

Examines the development of supply chain strategies and their interrelationships and impact on business competitive advantage is an insightful task. Presents a framework to strategically manage supply chains in rapidly changing markets builds further knowledge in the area of supply chain management, and learning how recent developments and best practices in supply chain management have supported the achievement of improved supply chain performance keeps supply chain management skills up to date.

**IET 4573 - Supply Chain Risk Management (3-1-3)**

Provides supply chain from a risk management perspective; Identifying and analyzing the risk of failure points within the supply chain; quantifying risks via metrics. Covers required skills to plan, manage, control, share and avoid supply chain risks attributed to various causes and unforeseen events are developed through the analysis of local and international scenarios, and case studies.

**IET 4583 - Procurement and Inventory Management (3-1-3)**

Examines business buying decisions, approaches of inventory management, assessment of inventory decisions affecting buying practices, including sourcing, procurement and supply management, or inventory classification. Provides review of modern approaches to managing inventory such as cost analysis, information systems used to make inventory decisions, critical thinking, and managerial skills.

**IET 4593 - Customer Relationship Management Systems (3-1-3)**

Covers customer Relationship Management (CRM) to support business processes and development. Examines utilization of the information technology resources, strategies, software and processes needed to support an effective CRM strategy. Assesses CRM techniques, to enhance customer service, sales force effectiveness and marketing strategy. Evaluates the benefits of creating customer loyalty, developing market intelligence and embedding a customer relationship management system into an organization.

**IET 4603 - Enterprise Resource Planning (3-1-3)**

Develops understanding of the concept of ERP systems and business processes interaction in an ERP system in areas of: Procurement, Materials Management, Production Planning and Execution, Sales Order Management, Financial Accounting and Controlling, and Enterprise Asset Management. Develops in-depth theoretical and practical knowledge regarding ERP through exercises and case studies.

**IET 4623 - Logistics and Transportation I (3-1-3)**

Explores the practices of logistics and transportation in the supply chain in the analysis of the performance of a firm. Presents functions of transportation, warehousing, material handling, packaging, cold chains, security, insurance and economics in logistics, and framework of how logistics and transportation can optimize supply chain efficiency and improve customer satisfaction.

**IET 4653 - Logistics and Transportation II (3-1-3)**

Covers transportation management and logistics methods to optimize supply chain objectives. Includes analyses cost implications of logistics and transportation in making products available to customers and firm performance evaluation. Covers solutions and decisions making for the supply chain involving the efficient integration of suppliers, manufacturers and retail stores with logistics and transportation, encompassing the activities of the firms from the strategic, tactical and operational level.

**IET 4783 - ISO Standards and Excellence (3-1-3)**

Provides an overview of the ISO family of international standards. Engage with industry to develop quality management systems in accordance with ISO standards. Compares various organizational performance, benchmarking, quality awards and other measures of excellence, such as the Baldrige Quality Award, Khalifa Quality Award and Dubai Quality Award.

**IET 4803 - Special Topics in Industrial Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

**IET 4893 - Directed Study (3-1-3)**

Explores and investigate a topic beyond the existing course material under the supervision of a faculty member.

**IET 4902 - Capstone Design Project I (1-2-2)**

Perform all aspects of an industrial engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**IET 4912 - Capstone Design Project II (1-3-2)**

Perform all aspects of an industrial engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisite: IET 4902

**INT 2156 - Business Internship I (0-40-6)**

Examines the direct linkages between the work environment, the understanding of the chosen major field of study and the knowledge gained through major core courses taken in the program. It provides an opportunity to integrate business principles and concepts learned in the classroom with real life work experience.

**INT 3156 - Business Internship II (0-40-6)**

Provides an opportunity to apply business theories, practices and skills learned over the duration of the program in the workplace setting. This course is driven by an evidence based portfolio approach to assessment. This course is driven by an evidence based portfolio approach to assessment.

**LAW 3103 - Business and Commercial Law (3-1-3)**

Provides an insight into the fundamental principles of law including contract and tort and the foundations of UAE law including the Civil Code and the Judicial System. Focuses on the business aspects of law including an introduction to company formation; financial control and workplace issues. Develops an understanding of how law may control business operations and the procedures for resolving conflict and seeking appropriate redress.

Prerequisite: MGT 3003

**LGE 2003 - Logistics Principles and Supply Chain Management (3-1-3)**

Provides a general overview of logistic elements. Exposure to manufacturing, trade and logistics service sectors, forwarding and transportation, logistic flows, and networks under cost and performance aspects will reinforce fundamental concepts. Provides opportunities to enhance knowledge and skills in analyses and project management through selected case studies.

**LGE 2013 - Transportation Modes (3-1-3)**

Covers different technologies used in various transportation modes: road, rail, air, seaborne and combined transportation, role of logistics in company operations and the role of transportation in company logistics. Introduces road, rail, air, combined and sea transportation: equipment; measurements; handling-related transportation; units and intermodal transportation.

Prerequisite: LGE 2003

**LGE 2203 - Introduction to Enterprise Information Management (2-2-3)**

Develops practical skills needed for study as well as for later employment. Students learn to manage enterprise data with a spreadsheet software (MS-Excel®) and with a database software (MS-Access®). Skills are developed through reading and many practical exercises using transparencies, a script, online materials and MS Excel® and MS-Access® example files.

**LGE 2313 - Managing People and Organizations (3-1-3)**

Covers the linkage between organizations; human resource management (HRM) and business success. Exposure to the principles of organizational behavior and the fundamentals of HRM. Introduce concepts of: organization structure and design; power and politics; motivation and job satisfaction; recruitment and selection, employee development and reward management; and the role of HRM in gaining sustainable competitive advantage for the organization.

**LGE 2902 - Sophomore Design Project (0-4-2)**

Perform all aspects of a logistics design project including the formation of a team to propose, plan and design a logistics engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**LGE 3203 - ERP I Principles (2-2-3)**

Covers Enterprise Resource Planning (ERP) system in integrated software with applications in all business areas of an organization including: accounting and finance; HR; sales and distribution; production; purchasing; and inventory. Introduce ERP theory and practice including the role of ERP in business process improvement, comparison of ERP and ERP2, ERP functionality and risk issues.

Prerequisite: LGE 2203

**LGE 3212 - ERP II Applications (2-1-2)**

Introduces ERP in modern business management: the basic concepts; applications; and their significance in business development. During the course students will work with reference models, acquire knowledge of possible solutions and action models for the development, adaptation and implementation of standard application systems. Focuses on financial modules, reporting, materials management and sales capabilities.

Prerequisite: LGE 3203

**LGE 3413 - Sales and Distribution in Logistics (3-1-3)**

Examines the management of the flow of goods (inventory), services, and related information among members in the supply chain (i.e., suppliers, manufacturers, distributors, retailers, logistics service providers and the end customer). Provides up to date knowledge and modern know-how on planning, designing and controlling the flow of physical goods to a market, along with the information and service necessary to meet customer demand.

Prerequisite: LGE 2003

**LGE 3503 - Accounting for Managers (3-1-3)**

Introduces management accounting as a tool to improve the operations and the profitability of the organization and examines management accounting field, its methods, purpose, and possibilities. The main content includes the basics of financial accounting, management accounting and decision making, cost management concepts, working capital and investment calculations, budgeting.

**LGE 4003 - National Transport and Planning Law (3-1-3)**

Examines the basics of national and international transport and insurance law. Analyses the evaluation and negotiation of logistics contracts. Introduces transportation legislation, contract law, contract of sale, dispatch, incomers. Discusses obligations and rights of the sender and obligations and rights of the carrier. In the air transport rules, the students are introduced to the Warsaw- and the Montreal-conventions.

**LGE 4013 - Hazardous Goods Management (3-1-3)**

Covers identification and assessment of risks when dealing with hazardous goods and materials. Introduces the design of appropriate measures of loss prevention and limitation of loss. Covers technical measures compatible with modern environmental, health-protection and safety systems. Covers the relationship between safety and quality management systems, principles of legislation and legal norms related to transport of dangerous goods by sea, road and air.

Prerequisite: LGE 2023

**LGE 4203 - GIS in Logistics (2-3-3)**

Covers GIS technology for tracking daily fleet movements and maintenance schedules, for integrating data from existing workforce, fleet, and customer management systems.

Prerequisite: LGE 2203

**LGE 4303 - Quality Control and Management (3-1-3)**

Introduces the students to qualitative and quantitative analytical tools used in a quality management system. An opportunity to study international quality management systems and how efficiently these tools are used to support strategic decision making in managing organizations. Identify problems with workflows within various parts of real organizations. Develops the students' ability to use appropriate quality management tools and to measure their effectiveness towards quality improvement from a strategic perspective.

Prerequisite: LGE 2303

**LGE 4313 - International Human Resource Management (3-1-3)**

Introduces the opportunities and challenges with managing employees in international and cross-cultural contexts. Covers HR processes in international, multi-national and trans-national corporations, and analysis of internationalization and globalization of HRM.

Prerequisite: LGE 2313

**LGE 4403 - Port Management (3-1-3)**

Covers business aspects of harbor management and cargo-handling, key issues and principles of implementation of logistics planning structures in harbor areas. Includes logistics interfaces to other transport systems, and the planning principles of ports. Covers the cost analysis and performance developments in ports. Covers relevant case studies of harbor infrastructures and the customer relations.

Prerequisite: LGE 2003

**LGE 4413 - Airport Management (3-1-3)**

Provides a fundamental understanding of the broad aspects of managing airports and the basic logistics concepts behind air cargo systems. Includes options of strategic decision-making in airport and air cargo management. Presents a short introduction of the major legislation affecting aviation, and the rules and regulations governing airport operations. Additional topics studied include: air traffic control; terminal management; and ground infrastructure of airports; and introduction to planning and running of air cargo systems.

Prerequisite: LGE 2003

**LGE 4423 - Intermodal Freight Transport (3-1-3)**

Introduces the concept of intermodal freight transport, the means of delivering goods using two or more transport modes. Detailed explanations are given of the road and rail vehicles, the loading units and the transfer equipment used in such operations.

Prerequisite: LGE 2003

**LGE 4433 - Public Transport (3-1-3)**

Introduces transport economics and the requirements on cost accounting in the public transport sector. Covers planning, building and maintenance of public traffic areas, examines the planning of route networks and time schedules for public transportation. Includes pricing, ticketing and the economics of timetables relevant to public transport.

Prerequisite: LGE 2003

**LGE 4453 - Management of Distribution Networks (3-1-3)**

Covers forging plans, steering and optimizing global distribution networks and relevant modern analysis tools. Includes conditions of distribution network transformation, analysis and evaluation of value chains and the current challenges of the management of global value. Includes practice work with SCM Systems like SAP SCM.

Prerequisite: IET 3303

**LGE 4463 - Maritime Transport (3-1-3)**

Introduces current maritime transportation concepts from a geographic point of view, focusing on the transportation practices in the world markets.

Prerequisite: LGE 2003

**LGE 4543 - Simulation of Logistics Systems (3-1-3)**

Covers in-depth knowledge of the techniques of computer simulation in general industrial and logistics systems. Understand the role of simulation in design, planning, and control of industrial and logistics systems. Identify how discrete event simulation can be used to model and analyze the performance of industrial and logistics systems. Assess available simulation packages in the market. Plan and manage the design and development of industrial and logistics systems using relevant simulation software.

Prerequisite: LGE 2003

**LGE 4603 - Transport and Economic Geography (3-1-3)**

Covers geography and transportation intersection in terms of movement of people, goods, and information. Commuting, supplying energy needs, distributing goods, and acquiring personal wants. Introduces location theory and the rationale for the location of industry, cities, and systems in their current location.

Prerequisite: LGE 4203

**LGE 4803 - Special Topics in Logistics Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

**LGE 4893 - Directed Study (3-1-3)**

Explore and investigate a topic beyond the existing course material under the supervision of a faculty member.

**LGE 4902 - Capstone Design Project I (1-3-2)**

Perform all aspects of a logistics engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**LGE 4911 - Capstone Design Project II (0-3-1)**

Perform all aspects of a logistics engineering design project including the formation of a team to propose, plan and design an industrial engineering project. Carry total responsibility for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

Prerequisite: LGE 4902

**LSC 1103 - Academic Reading and Writing I (3-1-3)**

First semester BAS course focusing on basic research and academic reading and writing skills. Connects reading to vocabulary acquisition and to the production of academic-style essays containing references. Students apply techniques such as brainstorming, organising and planning to generate ideas, as well as drafting, revising, editing and proofreading written work.

**LSC 1503 - Academic Spoken Communication (3-1-3)**

Students explore the use of spoken English in academic and professional contexts. They analyse extended formal speech as well as mini-lectures, and identify non-verbal features such as emotions from both linguistic and non-linguistic clues. Students then apply the knowledge gleaned to take part in discussions and other spoken activities, such as creating and delivering presentations, delivering public speeches, and participating in interviews.

**LSC 2103 - Academic Reading and Writing II (3-1-3)**

Fourth semester BAS course focusing on refining the skills needed for understanding longer texts and developing academic integrity and competency in writing academic English on a researched topic to a professional standard. Students interpret information and argument provided in longer academic texts and produce written English which successfully demonstrates their critical understanding of a topic and clear use of academic honesty principles using standard APA guidelines.

Prerequisite: LSC 1103 or EDUC 118 or LSEC N100

**LSC 2223 - Critical Thinking in English (3-1-3)**

Identify and construct sound arguments in English, often concerning fact, definition, evaluation, and proposal. Identify common strategies in English which seek to hinder critical communication in speech and writing and help students avoid common errors in reasoning. Construct coherent arguments which adequately manage pathos, ethos, and logos.

**LSC 2233 - Intercultural Communications in English (3-1-3)**

Provides a platform for students to explore intercultural communication issues in global society. Describes the key concepts and components of effective cultural communication and compares and contrasts cultural frameworks.

**LSC 2243 - Ethical Communication in English (3-1-3)**

Describe ethics as a discipline. Apply various forms of moral reasoning and ethical standpoints in communicative ethical decision making in interpersonal relationships, small groups, organizations and intercultural contexts. Discuss the role of ethics in professional or educational contexts. Explain and critique various issues in local and global ethics, including sustainable development. Justify and reflect on your own code of ethics.

**LSC 3023 - Professional English (3-1-3)**

Focuses on career preparation by developing students' writing, speaking, listening, presentation and negotiation skills and strategies. Students will demonstrate a mastery of the job application process by identifying, describing, and taking part in the different steps of applying for a job. They will also demonstrate proficiency in conducting and participating in career related meetings, simulations, presentations, and decision making, as well as creating meeting agendas, professional letters and other career related written communications. Prerequisite: LSC 1103

**LSM 1000 - Fundamentals of Applied Mathematics (3-1-0)**

Fundamental of Applied Math course focuses on developing strong basic skills and proficiency in, Arithmetic, Algebra, Data Analysis and an introduction to College Algebra to equip students with the math skills to succeed in the BAS program of their choice. Successful completion of LSM 1000 will be considered as having met basic Math skills requirement to join HCT BAS programs. Prerequisite: FND 3016

**LSM 1003 - Applied Mathematics (3-1-3)**

Solve business applications involving buying, selling and percentages. Compute and describe data using basic statistical techniques. Use linear models for business decision making. Apply linear regression and correlation analysis to problems with two business variables. Solve business problems involving simple interest and compound interest. Prerequisites: FND M020.

**LSM 1103 - Technical Mathematics (3-1-3)**

Demonstrate competence in algebraic manipulation by extending properties of numbers to symbols. Recognise characteristics of real numbers and apply these to solve real world problems. Solve equations algebraically and apply them to real-world problems. Explore geometric relationships, and apply techniques and formulas to solve real world problems. Recognise functional relationships and their graphs, and apply them to solve real-world problems and interpret solutions.

**LSM 1113 - Statistical Mathematics (3-1-3)**

Categorise, organise, summarise and present data in a meaningful way. Compute measures of central tendency and variability of data sets. Apply basic rules of probability to calculate the likelihood of random events. Construct the probability distribution of a discrete random variable and demonstrate its application to real life problems. Describe the characteristics of the normal distribution and demonstrate its application to real world problems. Perform regression analysis to make informed predictions about relationships between quantitative variables. Prerequisites: FND M020.

**LSM 1123 - Quantitative Reasoning (3-1-3)**

Apply the principles of inductive and deductive reasoning. Demonstrate proficiency in mathematical skills and conceptual understanding of the following topics: number theory, mathematical modeling, contemporary applications and geometry. Apply mathematical concepts to a variety of real world problems. Apply the concepts learned to the fields of music, design, photography and media in a project-based environment.

**LSN 1113 - Introduction to Sustainability (3-1-3)**

Define sustainability and sustainable development. Explain the environmental, social, and economic significance of natural resource extraction at a local, regional, national, and global level. Understand and explain the human impact on the planet using a variety of measures. Recognise the human impact on basic ecological systems. Relate the concept of social responsibility to local, regional, national, and global issues.

**LSN 1303 - Health and Wellness (3-1-3)**

Covers the discussion of what constitutes health and well-being and their various dimensions and the techniques that one can adopt for their development and maintenance. Basic human anatomy and physiology, fitness, nutrition and the varying nutritional requirements in different life stages, stress and stress management, and psychosocial development are presented and discussed. First Aid training is also presented and administered.

**LSN 2433 - Ecology (3-1-3)**

Recognise basic ecological concepts and describe a variety of interactions between organisms, natural selection and adaptation to the environment. Define species, population, community and ecosystem. Recognise the main marine and terrestrial ecosystems in the UAE and the Gulf Region and major land ecosystems in the world. Describe the carbon, hydrological and nutrient cycles and identify human influences on these cycles. Describe practical applications of ecological knowledge: nature conservation and waste management.

**LSN 2503 - Introduction to Nutrition (3-1-3)**

Identify the major physiological areas that are affected by nutrition. Describe the fundamental physiology of digestive processes. Evaluate energy needs and balance along with their health implications. Identify the effect of poor nutrition to illness and diseases, including but not limited to food borne diseases, diabetes, and cardiovascular diseases. Understand the importance of food safety and security in the preparation and storage of food. Describe the role of nutrition in growth and health throughout the life cycle.

**LSS 1003 - Life and Study Skills (3-1-3)**

Recognizes the importance of life-skill development for successful learning. Introduces HCT regulations, services and learning support systems. Deals with psycho-social skills for decision making and time/stress management. Develops study and communication skills for critical thinking, problem solving and creativity. Improves inter-personal empathy leading toward satisfying academic and professional lives.

**LSS 1123 - Basic Methods of Scientific Research and Development (3-1-3)**

Introduces the basic concepts and processes of scientific research, innovation and development. Enables students to identify research problems, formulate hypotheses, write a literature review and collect, analyze and interpret data. Clarifies the importance of ethical research behavior. Provides practical opportunities to apply creative and innovative thinking to research problems and write an associated research report.

**LSS 2403 - Innovation and Entrepreneurship (3-1-3)**

Applying a Stanford-informed approach to learning innovation and entrepreneurship develops the concepts and skills of how to start and run new ventures and discusses challenges entrepreneurs face in a rapidly changing economic environment. The course covers three main modules: design thinking, entrepreneurship, and growth and leadership.

**MAR 2203 - Naval Architecture (3-1-3)**

Introduce the maritime profession, including basic information on ship design/categorization, the ship building, designing and operating professions, an introduction to the rules and regulations governing maritime operations, including classification societies and IMO. An introduction to principal features of ships, including lines drawing. Covers hydrostatics, intact stability, small angle stability, cross curves and large angle stability. Free surface, list and loll angles, and trim. The concept of the trim and stability booklet is introduced, and its application explained.

Prerequisites: MCE 2203, MCE 2223, MCE 3403 and MTH 2103

**MAR 3103 - Marine Machinery Systems (3-1-3)**

Introduces machinery systems used on ships, both for main propulsion and auxiliary/hotel loads. Includes low speed diesels; medium speed diesels; steam turbines; gas turbines; boilers; electric propulsion; podded propulsion; bow thrusters; controllable pitch propulsion; scrubbers; pumping and piping; electricity generation; fuel supply; rudders and steering gear; cranes and other deck machinery; and automation issues.

Prerequisite: MAR 2203

**MAR 3202 - Ship Production (2-1-2)**

Covers the overall philosophy and techniques for the manufacture of ships, including materials, welding, and cutting, shipyard practice and shipyard layout, with the differences between approaches for different ship sizes and types covered.

Prerequisites: MCE 2323 and MAR 2203

**MAR 3303 - Resistance and Propulsion (3-1-3)**

Covers an introduction to the resistance and propulsion of surface ships. It includes: components of resistance; Froude's law of similitude; the principles associated with model testing for resistance prediction; systematic series; ship-propeller interaction and an introduction to the use of Computational Fluid Dynamics, as applied to ship resistance prediction. Cover the concepts associated with the design of a ship's propeller including the principal features of propellers; the use of systematic series; and cavitation.

Prerequisites: MAR 2203 and MTH 3013

**MAR 3402 - Ship Structures I (2-1-2)**

Introduces rationally based structural design and optimization for ships. Loading and responses in ship structures. Bending of the hull girder, and hull girder response. Application of beam theory to typical ship types, including those with open decks. Fatigue and fracture of ship structures, including an introduction to fracture mechanics.

Prerequisites: MTH 2503, MCE 2203, MCE 2223, MCE 2213 and MCE 2311

**MAR 3503 - Design of Ships and Maritime Structures (3-1-3)**

Introduces the fundamental aspects of the rational engineering approach to, and issues which influence, the design of ships and maritime structures. CAD skills as applied to ship design, including specific commercial modelling software are introduced.

Prerequisites: MCE 2203, MCE 2223, MCE 2213, MCE 2311, MCE 2403, MAR 2203 and MAR 3103

**MAR 4423 - Coastal Engineering and Maritime Structures (3-1-3)**

Includes an introduction to the study of processes ongoing at the shoreline and within the coastal zone. Longshore and cross-shore currents are covered, including their effect on sand transport and beach erosion. Covers the design of typical maritime coastal structures, including: breakwaters; groins; jetties; and sea walls.

Prerequisites: MAR 2203 and MAR 4833

**MAR 4433 - Offshore Engineering (3-1-3)**

Introduces offshore engineering, including the design of offshore platforms for oil and gas exploration and production. Includes an introduction to subsea engineering, including subsea completions and pipelines on the seabed.

Prerequisites: MAR 2203, MAR 3402, MAR 3503 and MAR 4833

**MAR 4443 - Ship Production II (3-1-3)**

Covers advanced ship production techniques, following on from MAR 3203, Ship Production. It focusses on efficient shipyard layout and ship production techniques, making use of international best practice, as applied in the UAE context. Economic aspects of ship production, and shipyard practices are also included, as well as project management, as applied to ship production.

Prerequisites: MAR 2203, MAR 3202, MAR 3402 and MAR 3503

**MAR 4453 - Ship Repair (3-1-3)**

Focuses on ship repair techniques, including regular maintenance, following on from MAR 3203, Ship Production. Ashore and afloat techniques are included, and issues associated with both are discussed in detail. Project management techniques used for ship repair are also covered.

Prerequisites: MAR 2203, MAR 3202, MAR 3402 and MAR 3503

**MAR 4463 - Port Engineering (3-1-3)**

Covers the planning and engineering of ports and harbours. Ship berthing and manoeuvring aspects are covered, including the need for, and the design of, navigation aids. Engineering issues associated with the design of different types of marine terminals (container, dry bulk, and liquid bulk, including gas) are included.

Prerequisites: EGN 3012, MCE 2213 and MAR 2203

**MAR 4703 - Shipping Management (3-1-3)**

Introduces the technical and operational aspects of ship management. The operations that are necessary to transport cargo in a safe, efficient, and commercially viable manner are included. Nautical, commercial and cargo operations are examined in detail. The course also examines the concepts which underpin ship operations, including: asset maintenance; quality management; and risk management.

Prerequisite: LGE 2003

**MAR 4803 - Ship Structures II (3-1-3)**

Introduces theories and concepts to describe and analyse the dynamic response of ship structures. Apply analytical models to the design of ship structures, and explore the use of simple and advanced methods to obtain internal forces and displacements, as well as buckling loads. Covers statistical predictions of wave-induced loads and hull girder response. Includes load cases prescribed by Classification Societies, and the application of Classification Society rules to ship structures.

Prerequisite: MAR 3402

**MAR 4805 - Maritime Design Project I (5-1-5)**

Covers the knowledge and capabilities developed during the previous years on the program, as applied to the design of a ship and associated machinery systems.

Prerequisites: EGN 3012, EGN 3212, MAR 2203, MAR 3103, MAR 3202, MAR 3402 and MAR 3503

**MAR 4833 - Seakeeping and Manoeuvring (3-1-3)**

Covers an introduction to ocean waves; the prediction of ship motions in regular waves (both experimentally and numerically); statistical approaches to assessing the motions of a ship in a seaway, motions criteria, and introduction to ship manoeuvring in open and in restricted water, including the concepts of ship-ship interaction.

Prerequisites: MAR 2203, MAR 3503, MTH 1113 and MTH 2503

**MAR 4853 - Marine Surveying (3-1-3)**

Covers introduction to the principles of ship and engine surveying, as required by a marine surveyor, issues associated with surveying for new build and/or repair in a shipyard and those associated with ongoing surveys, and port state control.

Prerequisite: MAR 3402

**MAR 4865 - Maritime Design Project II (5-1-5)**

Covers the knowledge and capabilities developed during the previous years on the program, as applied to the design of a ship and associated machinery systems.

Prerequisites: MAR 4805 and MAR 4833

**MAR 4883 - Maritime Transportation (3-1-3)**

Introduces to the economic principles of commercial shipping practice. Includes the basics associated with ship ownership, ship chartering, and commercial ship operation. Covers the principles of international trade, international commerce, the key trade routes, and the role of shipping in an integrated multi-modal supply chain.

Prerequisite: EGN 3212

**MAR 4903 - Marine Safety (3-1-3)**

Covers the issues associated with marine safety, including the concepts of risk management, designing for safety, maritime safety regulations, and classifications societies. Discuss case studies based on maritime accidents, and their subsequent effect on maritime regulations and accident investigation procedures are also covered.

Prerequisites: MAR 2203 and MAR 3503

**MAS 1003 - Introduction to Law (3-1-3)**

Building upon an earlier study of the law concept and principles, in particular the legal types of various laws, and the common law aspects and its relationship, and the substantive areas of constitutional law, the general theory of the rights and rights types, criminal law, and property. The course focuses on the application of laws of all UAE social and government life aspects of the law, Students will develop skills to critical legal thinking, and comparative approach law systems; understand methods of legal dispute settlement; and apply the appropriate law.

**MAS 2133 - Human Rights (3-1-3)**

This course provides information and understanding of international human rights standards related to law enforcement, encourage, and develop the skills to transform this information into practical behavior. Also, explain for the students their roles in protecting and promoting human rights and their impact on the daily work. Enhancing the respect of law enforcement officials for human dignity and rights. The course also includes the legislative basis for human rights in the United Arab Emirates laws and its protection mechanisms.

**MCE 2203 - Applied Statics (2-2-3)**

Covers the fundamentals of particles and rigid bodies equilibrium with engineering applications. Includes equilibrium of forces and moments applied to particles, rigid bodies, and engineering structures; equilibrium in two and three dimensions; free-body diagrams; friction; centroids; centers of gravity; moments of inertia. Laboratory and projects on planar equilibrium, forces in structural members, friction, center of mass, and areamoments of inertia.

Prerequisite: PHY 1103 and CHM 1103

**MCE 2213 - Mechanics of Materials (2-2-3)**

Covers concepts of stress, strain, deformation, strain energy and load carrying capacity of structural members subjected to tension, compression, shear, torsion, and bending. Introduces stress-strain transformation relations and mechanical design concepts. Laboratory experiments are conducted covering the course topics.

Prerequisites: MCE 2203 and MCE 2303

**MCE 2223 - Applied Dynamics (2-2-3)**

Covers kinetics and kinematic analysis of particles and rigid bodies in translation and rotational mechanical systems; position; velocity; acceleration; energy; impulse and momentum. Includes case studies to solve two dimensional problems in kinematics and kinetics for particles and rigid bodies. Laboratory experiments on measurement of velocity and acceleration of translational and rotational motion.

Prerequisites: MCE 2203 and MTH 2103

**MCE 2303 - Material Selection and Testing (2-3-3)**

Apply material selection criteria for specific engineering applications through the understanding and identification of materials, their mechanical properties and material defects. Explain atomic bonding, structure, imperfections, grain-size and re-crystallization and describe material failure and causes of corrosion with prevention methods.

Prerequisite: PHY 1103 and CHM 1103

**MCE 2311 - Solid Modelling (0-3-1)**

Covers the fundamentals of 2D/3D CAD and the steps involved in the process of designing 3D mechanical components and/or assemblies. Use CAD software for modelling of solids with parametric capabilities, creation of assemblies, design validation and finally the creation of 2D engineering views.

Prerequisite: EGN 1133

**MCE 2323 - Manufacturing Technology I (2-2-3)**

Introduce concepts of basic manufacturing processes and fabrication techniques such as metal casting, metal forming, sheet metal processes, manufacture of plastic components and metal joining processes.

Prerequisite: MCE 2303

**MCE 2332 - Geometric Dimensioning and Tolerancing (1-3-2)**

Introduce basics of general Tolerancing symbols and terms. Use geometric Tolerancing, datum, material condition symbols, geometric characteristics and position tolerance.

Prerequisite: MCE 2311

**MCE 2403 - Thermodynamics (2-2-3)**

Study thermodynamics properties of pure substances, properties and equations-of-state of ideal and real gases used to solve thermodynamic problems. Learn the forms of mechanical work and heat transfer mechanisms. Apply the first law of thermodynamics (conservation of energy) to non-flow processes (closed systems) and flow processes (open systems). Apply the second law of thermodynamics to thermodynamic processes, idealized heat engines, and heat pumps.

Prerequisite: PHY 1103

**MCE 2903 - Sophomore Design Project (2-2-3)**

Introduces engineering design process and techniques. Identifies various engineering components and materials. Describes functions of common mechanical elements including flexible power transmission systems, keys and couplings, shafts, fasteners, welded joints and springs. Applies simple data and decision analysis techniques necessary to design different elements commonly found in mechanical systems. Execute what is learnt to complete the design of an engineering product or system

Prerequisites: MCE 2203, MCE 2303 and MCE 2311

**MCE 3203 - Applied Mechanical Vibration (2-2-3)**

Covers the theory of mechanical vibrations occurring in single and multi-degree-of-freedom systems. Explains the principles of vibration control such as vibration isolation and vibration absorbers. Includes laboratory experiments to demonstrate the basic principles of mechanical vibrations.

Prerequisite: MCE 2223

**MCE 3303 - Manufacturing Technology II (2-2-3)**

Covers the mechanics of metal cutting and functionality of standard machine cutting tools. Includes different types of metal cutting operations such as turning, milling, drilling and grinding. Understand the basic concepts of Computer Numerical Control (CNC) of machine tools and CNC Programming.

Prerequisite: MCE 2323

**MCE 3343 - Industrial Plant Maintenance (2-2-3)**

Provides review on importance of maintaining equipment and machinery in industry. Covers different types of maintenance such as predictive, preventive, scheduled, corrective, and machine health monitoring. Explores common problems and use of troubleshooting techniques encountered in industrial plants. Introduces different concepts in maintenance management and planning.

Prerequisite: MCE 2323

**MCE 3403 - Fluid Mechanics (2-2-3)**

Covers fluid properties and pressure, hydrostatics, and dynamics of fluid flow, friction losses, and sizing of pipes with emphasis is on problem solving. Includes practical experiments to reinforce the theory.

Prerequisites: MCE 2223 and MCE 2403

**MCE 3413 - Applied Heat Transfer (2-2-3)**

Covers basic heat transfer laws including steady-state and transient heat flow, one-dimensional heat conduction in solids, free or forced convection in fluids, radiation and phase change and analysis of heat exchangers. Includes engineering applications involving heat transfer in the design or selection of heat exchangers and building insulation materials.

Prerequisite: MCE 3403

**MCE 3413 - Applied Heat Transfer (2-2-3)**

Covers basic heat transfer laws including steady-state and transient heat flow, one-dimensional heat conduction in solids, free or forced convection in fluids, radiation and phase change and analysis of heat exchangers. Includes engineering applications involving heat transfer in the design or selection of heat exchangers and building insulation materials.

Prerequisite: MCE 3403

**MCE 3503 - Mechanical Design (2-2-3)**

Covers concepts and applications of various common mechanical elements including types of loading, flexible power transmission systems, keys and couplings, shafts, fasteners, welded joints and springs. Includes design calculations to select desired components for specified applications. Applies data and decision analysis techniques necessary to design these elements commonly found in mechanical devices and systems.

Prerequisites: MCE 2213 and MCE 2903

**MCE 3513 - Machine Elements and Mechanisms (2-2-3)**

Extends methods developed in statics, dynamics, and strength of materials to the selection of basic machine components. Develops fundamental principles required for the selection of individual elements that compose a machine. Graphical and semigraphical methods are used to determine displacements, velocities, and accelerations in common mechanisms. Covers cam followers and basic motions; static and dynamic force analysis; static and dynamic shaft balancing. Includes laboratory experiments using CAD packages and laboratory equipment.

Prerequisite: MCE 3503

**MCE 3601 - Engineering Measurements Lab (0-3-1)**

Covers measurement techniques and instrumentation used in mechanical engineering, considering calibration, precision, accuracy, and error measurements. Conducts experiments using to measure force, torque, pressure, flow and temperature.

Prerequisite: MCE 3403

**MCE 3613 - Fluid Power (2-2-3)**

Covers fundamental concepts of fluid power and electro-fluid power systems. Cover principles of fluid power, hydraulic control, related parameters, components, circuits, symbols, and their ability to do work. Introduce troubleshooting techniques in fluid power with emphasis on safety.

Prerequisites: MCE 2203 and MCE 2403

**MCE 4303 - Computer Integrated Manufacturing (2-2-3)**

Introduces computerized applications in Manufacturing, Design, Process planning, Manufacturing cost, Layout and Material Handling systems. Includes class projects and laboratory experiments.

Prerequisite: MCE 3303

**MCE 4313 - Advanced Geometric Dimensioning and Tolerancing (2-2-3)**

Covers tolerances attributed to maximum material boundary (MMB), least material boundary (LMB), and regardless of material boundary (RMB). Cover complex GD&T situations and coaxial tolerances. Runs practical laboratories to enhance students understanding to evaluate and use intermediate and advanced geometric dimensioning techniques.

Prerequisite: MCE 2332

**MCE 4323 - Non Destructive Testing (2-2-3)**

Covers various Non Destructive Testing methods, theory and industrial applications. Demonstrates differences between non-destructive testing and mechanical testing methods. Applies testing techniques for surface, liquid dye penetration method, thermography, eddy current testing, ultrasonic testing, acoustic emission and radiography testing methodologies.

PrerequisiteS: MCE 2213 and MCE 3303

**MCE 4333 - Production Planning and Control (2-2-3)**

Covers various components and functions of production planning and control such as, work study, product planning, process planning, production scheduling, and inventory control. Includes recent trends in Manufacturing Requirement Planning (MRP II) and Enterprise Resource Planning (ERP).

Prerequisite: MCE 4303

**MCE 4403 - Refrigeration and Air Conditioning System (2-2-3)**

Covers classification of refrigeration and air-conditioning systems and their applications in industry. Provides analyses of ideal and actual vapor compression refrigeration cycles, components, and systems. Describes simple vapor absorption systems. Study of psychometrics to determine the properties of moist air. Includes analyses of air conditioning processes, estimation of cooling loads using standard and UAE design conditions, and sizing the ducting system of a central air AC system.

Prerequisites: MCE 3413 and MTE 2403

**MCE 4413 - Turbomachinery (2-2-3)**

Covers concepts, procedures, data and dimensional analysis techniques to evaluate the flow and energy transfer through turbo machines. Includes Euler's turbine equation, thermodynamics, fluid flow in turbomachines, and power-absorbing turbomachines and power-producing machines analyses.

Prerequisite: MCE 3403

**MCE 4423 - Power Plant Engineering (2-2-3)**

Covers the laws of thermodynamics in the design and optimization of basic energy conversion processes within various power plants. Studies fundamental thermodynamic properties including cycle efficiency and the concepts of nuclear power plants operation as well as economics of power plants.

Prerequisite: MCE 2403

**MCE 4433 - Internal Combustion Engines (2-2-3)**

Applies thermofluid concepts to different types of internal combustion engines. Study various factors affecting the performance of IC engines (fuels, combustion, exhaust emissions and pollution, detonation, fuel injection, etc). Runs laboratory experiments on heat transfer, exhaust emissions and lubrication of IC engines.

Prerequisite: MCE 3413

**MCE 4443 - Computational Fluid Dynamics (2-2-3)**

Implements numerical techniques employed in thermofluid analysis. Uses CFD software to model fluid flow in aerospace, automotive, and other engineering applications.

Prerequisite: MCE 3413

**MCE 4453 - Desalination Engineering (2-2-3)**

Covers different methods of water analysis and treatment about different types of desalination processes, such as, multi-stage and multi effect distillation, reverse osmosis, freezing, and electro-dialysis. Includes the environmental, sustainability, and economical factors that may influence the performance, affordability, and availability of desalination processes. Explores renewable energy technologies used in desalination.

Prerequisite: MCE 3413

**MCE 4463 - Energy Conservation and Management (2-2-3)**

Covers theoretical and practical concepts related to environmental issues and sustainable development. Includes renewable and non-renewable energy sources and related technical, economical, ethical, and philosophical aspects. Covers available methods for optimizing energy consumption considering air pollution, global warming and impacts on other ecological systems.

Prerequisites: MCE 3413, MCE 3513 and EGN 2712

**MCE 4503 - Finite Element Analysis (2-2-3)**

Introduces the concepts of numerical methods in modelling for engineering problems. Applies basic concepts of finite element methods using spring, bar, beam and triangular elements in different applications such as stress and vibration analysis. Includes CAD tools utilization and laboratory projects and experiments.

Prerequisites: MCE 3413, MCE 3513 and EGN 2712

**MCE 4513 - Integrated Design for Manufacture and Assembly (2-2-3)**

Introduces the concepts and technologies of contemporary product manufacturing. Demonstrates the integration between product design and manufacture. Applies modern computer technologies in product design, manufacturing, and assembly in accordance with commercial demands and economic considerations.

Prerequisite: MCE 3303

**MCE 4603 - Control Systems (2-3-3)**

Covers fundamental concepts in control system analysis and design which include, mathematical modeling of dynamical systems, time responses of first and second-order systems, steady-state error analysis, frequency response analysis of systems and design methodologies in both the time and the frequency domains.

Prerequisites: MCE 2223 and MCE 3203

**MCE 4613 - Robotics and Automation (2-2-3)**

Introduce theoretical concepts and applications of robotic systems. Describe and analyze power sources, drives and transmissions used in various industrial applications. Study the kinematics and kinetics of robotic systems. Learn about sensors, switches, devices, assemblies and maintenance of robotic systems.

Prerequisites: MTH 2503, MCE 3303, MCE 3513 and MCE 4603

**MCE 4623 - Introduction to Mechatronics (2-2-3)**

Integrate the knowledge gained in mechanical and electrical courses to cover theoretical and real design steps of mechatronic systems. Explore different types of sensors, input/output interfacing circuits, microcontroller programming and actuators, through emphases on practical applications.

Prerequisites: ELE 2153 and MCE 4603

**MCE 4863 - Special Topics in Mechanical Engineering (2-2-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

**MCE 4893 - Directed Study (2-2-3)**

Provides an opportunity to investigate under faculty supervision beyond what is offered in existing courses.

**MCE 4902 - Capstone Design Project I (1-3-2)**

Coordinate to form project teams to propose, plan and design an engineering product. Gain the knowledge to identify design problems to meet industrial needs. Define design projects' criteria, components, resources, implementation schedule, and estimated costs.

**MCE 4912 - Capstone Design Project II (1-3-2)**

Continue on the engineering design project carried forward from the preceding semester. Implement, build, test, evaluate, and analyze the proposed design. Develop and gain organizational, communicational and interpersonal skills.

Prerequisite: MCE 4902

**MET 1113 - Fabrication and Repair I (3-1-3)**

Introduction to workshop practices and the use of machine tools as relevant to seagoing marine engineers. Provides basic quality control checks of finished products. Material includes health, safety and environment regulations, and proper use of fabrication tools and regular logbook maintenance skills.

**MET 1122 - Introduction to Marine Engineering (2-1-2)**

Introduction to marine engineering, designed for students undertaking the bachelor of Applied Science, Marine Engineering Program. Include basic information on marine engineering and the relevant rules and regulations governing maritime operations, including classification societies and IMO.

**MET 1132 - Marine Chemistry (2-1-2)**

Introduction to marine chemistry. Covers the properties of matter in terms of fundamental principles and provides the understanding of chemical energy concepts. Introduce gas law and kinetic theory of gases, spontaneity of reaction, chemical equilibrium, properties of solutions, and study the phenomena of liquid at interface. Focus on applications of particular interest to the marine environment.

**MET 1210 - Marine Engineering Seetime I (0-10-10)**

Undertaken under the supervision of a senior officer while the student is at sea. A detailed record of tasks and duties performed under the direction of ships officers will be kept in a training record book, dated and signed by the supervising officers. This Training Record Book (TRB) together with a number of project work and assignments will be assessed for completion by HCT staff at the end of the semester. The material will include: use of hand tools; watchkeeping; electrical systems; auxiliary equipment; and maintenance.

Prerequisites: MTR 1003, MET 1113 and MET 1122

**MET 2303 - Mathematics for Marine Engineering (3-1-3)**

Covers mathematical skills essential for progression to the study of calculus and further engineering mathematics. Includes polynomials, linear algebra, vectors, complex numbers, exponential and logarithmic functions, variation and inequalities.

**MET 2313 - Marine Engineering Knowledge (3-1-3)**

Introduction to the theories and principles of a very wide range of marine engineering equipment, including: main engines (different types); auxiliary engines; marine boilers; shafts; seals; tanks (fresh water, ballast, and cargo); valves; air conditioning equipment; refrigeration equipment; pumps (different types); steering gear; stabilizers; and scrubbers.

**MET 2403 - Fluid Mechanics for Marine Engineering (3-1-3)**

Covers the basic concepts of fluid mechanics. Emphasis will be placed on basic topics including fluid properties, hydrostatics and hydrodynamics (buoyancy, forces on submerged surfaces, pipe flow and energy losses). The course practical work will reinforce the theory through a set of experiments in the hydraulics laboratory.

**MET 2413 - Applied Marine Mechanics I (3-1-3)**

Covers basic theory and operation of two and four-stroke marine engines (inboard, outboard and jet) as well as common boat hull types and boating terminology.

**MET 2423 - Ship Stability (3-1-3)**

Covers the basic stability of ships to enable seagoing officers to understand issues associated with loading, unloading and moving of cargo and related aspects. Includes transverse stability (small angle and large angle), free surface effects, list and loll angles, and trim. Introduce the concept of the trim and stability booklet, and its application.

Prerequisite: MET 2303

**MET 2433 - Fabrication and Repair II (3-1-3)**

Builds upon the fabrication and repair course in first semester, together with the experience that the cadets will have obtained during their first period of seetime. It covers more advanced fabrication techniques, including the construction of a more elaborate example piece. Health and safety issues continue to be emphasized.

Prerequisites: MET 1113 and MET 1210

**MET 2442 - Marine Material Technology I (2-1-2)**

Introduction to the wide range of materials used in the maritime environment. It covers: mild steel; stainless steel; aluminium; concrete; wood; and glass reinforced plastic. The particular issues with each of these for the maritime environment are discussed, and applications for each included. In addition, the particular properties of the wide range of different mild steels is discussed in detail.

Prerequisites: MET 1113 and MET 1132

**MET 3510 - Marine Engineering Seetime II (0-10-10)**

Conducted at sea, and will be supervised by a senior officer on board. A detailed record of tasks and duties performed under the direction of ships officers will be kept in a training record book, dated and signed by the supervising officers. This Training Record Book together with a number of project work and assignments will be assessed for completion. Includes watchkeeping; practical engineering knowledge; electrical systems; maintenance; and practical control engineering. Meets the requirements of the STCW Convention for shipboard training of deck officer trainees.

Prerequisites: MET 1210, MET 2313 and MET 2433

**MET 3603 - Applied Marine Mechanics II (3-1-3)**

Covers electrical theory, mechanical theory, fuel systems, ignition systems, rigging and propping, maintenance, and off season storage.

**MET 3613 - Ship Construction (3-1-3)**

Introduction to the concepts and principles of naval architecture and ship construction. It covers practical aspects of ship design, including the purpose and names of important elements of a ship. Different ship types, the reasons for these and their principal design differences are covered. These include: general cargo vessels; dry bulk carriers; oil tankers; gas carriers; containerhips; cruise ships; passenger ships; ferries; tugs; supply boats, other support vessels; and warships.

**MET 3623 - Marine Engineering Control I (3-1-3)**

Introduction to the basic applications of automatic control theory and the use of these concepts in a wide variety of different marine applications. Different concepts of control theory are considered, and their applications on board ships discussed. Typical control hardware is studied, and examples given.

**MET 3633 - Marine Electrical Systems I (3-1-3)**

Introduction to the fundamentals of common electrical machines used in maritime environments. The physical concepts and basic laws governing electrical machine operation are introduced, and the principles underlying the performance of electrical machines are explained. In addition, the course covers power transformation and transmission in ships. A number of shipboard applications are given.

Prerequisite: MET 2313

**MET 3643 - Diesel Engine Maintenance (3-1-3)**

Comprehensive introduction to the maintenance of diesel engines in the maritime environment. Typical large low speed two stroke diesel engines are included, as well as smaller high and medium speed diesel engines. In addition to routine maintenance, troubleshooting issues are included.

**MET 4710 - Marine Engineering Seetime III (0-10-10)**

Includes a detailed record of tasks and duties performed under the direction of ships officers will be kept in a training record book, dated and signed by the supervising officers. This Training Record Book together with a number of project work and assignments will be assessed. Includes marine machinery operations; practical engineering knowledge; maintenance; watchkeeping and practical control engineering. Meets the requirements of the STCW Convention for shipboard training of marine engineering officer trainees.

Prerequisite: MET 3510

**MET 4804 - Engineering Knowledge - Diesel (4-1-4)**

Covers the theory, design, operation and maintenance of marine diesel engines. Two and four stroke diesels are included, as are low speed, medium speed and high speed. Applications of each of these are given, along with the pros and cons of each. In addition, recent developments in diesel engines are covered. Dual fuel diesel/gas engines, and gas engines are also included.

Prerequisite: MET 2313

**MET 4814 - Engineering Knowledge - Steam (4-1-4)**

Covers the theory, design, operation and maintenance of marine diesel engines. Two and four stroke diesels are included, as are low speed, medium speed and high speed. Applications of each of these are given, along with the pros and cons of each. In addition, recent developments in diesel engines are covered. Dual fuel diesel/gas engines, and gas engines are also included.

Prerequisite: MET 2313

**MET 4823 - Marine Airconditioning and Refrigeration (3-1-3)**

Introduction to air conditioning systems and refrigeration systems on board ships. The principles and theory of operation of typical equipment is covered. This includes equipment for hotel services as well as for cargo, such as refrigerated cargo, and refrigerated containers. Examples of applications of various types of equipment are given.

Prerequisite: MET 2313

**MET 4833 - Marine Engineering Control II (3-1-3)**

Builds on the previous control course and extends the knowledge of control theory and its application in the marine environment in a practical manner. In addition, specialist areas of control relevant to different pieces of shipboard equipment are considered, and the range of relevant control strategies examined.

**MET 4843 - Marine Electrical Systems II (3-1-3)**

Introduction to the various electrical systems that are on board ships. It includes an introduction to a variety of bridge equipment such as: electronic navigational aids; sonar; meteorological equipment and instrumentation. Electrical cargo handling equipment, including: cranes; pumps; lifts; and ramps are covered. Electrical equipment in the accommodation and engine room are also included.

**MET 5005 - Leadership for Chief Engineers (5-1-5)**

Prepare students for the position as Chief Engineer. The requirements of a chief engineer are covered, along with various leadership strategies to best meet the challenges of leading a diverse group of officers and crew on a ship. In addition, the differences between shipboard command and senior leadership positions ashore are discussed. In addition to routine operations, the leadership skills and techniques to be employed in a variety of on board emergency situations are covered.

**MET 5014 - Marine Machinery Operations (4-1-4)**

Capstone course which covers all operations of the wide range of marine machinery used on board ships from the view point of a chief engineer. It includes all the processes from start up to shut down, both in routine operations and under emergency conditions. Troubleshooting and other unusual operational scenarios are included.

**MET 5024 - Advanced Ship Regulation and Survey (4-1-4)**

Covers regulations concerning the construction of passenger ships, cargo ships and barges. Conduct a ship survey with effectiveness and efficiency. Essential law, safety and operational surveys, incident and accident investigation along with writing the survey report and flag and port state control inspections.

**MET 5903 - Marine Material Technology II (3-1-3)**

Covers the theory of marine materials in a greater depth. In particular, mild steel, and the various classifications of this are dealt with. Theoretical considerations of other materials used on board ships are also covered, including: high strength steel; stainless steel; aluminium; and fibreglass. The compatibility of different materials is covered, both from a point of view of corrosion and also from load bearing considerations.

**MET 5914 - Ship Design and Technology (4-1-4)**

Covers a range of technical topics, building on knowledge gained earlier in the program, associated with the design and construction of different vessel types, including: general cargo vessels; dry bulk carriers; oil tankers; gas carriers; containerhips; cruise ships; passenger ships; ferries; tugs; supply boats; other support vessels; and warships.

**MET 5924 - Advanced Marine Engineering Knowledge (4-1-4)**

Advanced course on marine engineering application and knowledge, which brings together all the earlier courses. This is covered in a capstone manner as required for the chief engineer on board a ship who needs to have a thorough understanding of all equipment and structure on the ship, and their interaction, both in routine situations and in emergencies. An introduction to project management is also included.

**MET 5934 - Marine Engineering Project (4-1-4)**

First of two linked project based final year courses. An appropriate project will be chosen by the student with guidance from relevant faculty members. Conducting the project will integrate many of the skills and knowledge obtained during the program, as well as develop independent learning. Students are expected to submit, and defend, their project in the presence of faculty members, and their peers.

Prerequisite: MET 4710

**MGT 1003 - Principles of Management (3-1-3)**

Examines the concept of leadership and management as understood by practicing managers and behavioral scientists. Covers the basic functions of management, management levels and skills, model of communication, individual and group decision making, role of leaders in managing change, leadership theory, concepts and practical issues related to both the UAE and the wider business environment.

**MGT 2103 - Organizational Behavior (3-1-3)**

Provides an in-depth examination of occupational and organizational issues such as leadership style, motivation, rewards systems, job design, employee performance, worker health and well-being, including aspects related to power and politics at work. It also looks at organizational culture, diversity, equity, and organizational structures that allow companies to gain sustainable competitive advantage.

Prerequisite: MGT 1003

**MGT 3003 - Business Ethics and Corporate Governance (3-1-3)**

Develops the ability to critically evaluate business issues that are ethically ambiguous or contain ethical dilemmas. Ethical theories, ethical concepts, relationships between stakeholders, professional ethics and sustainability are studied in relation to the world of work. Corporate social responsibility (CSR) and corporate governance (CG) principles are studied and applied from local and international business perspectives.

Prerequisite: MGT 2103

**MGT 3103 - Strategic Management and Simulation (3-1-3)**

Primarily through the use of topical case studies, it analyses the nature of competitive advantage, and the various strategies available for firms to develop sustainable business growth in a global environment. The course features a complex business simulation game in which students demonstrate a series of inter-related decisions, their ability to apply business administration concepts in practice, for the benefit of an imaginary company.

**MGT 4043 - Management Science (3-1-3)**

Develop an understanding of the quantitative techniques and tools to resolve managerial decision problems related to resource allocation, optimization, process management and decision analysis problems in organizations. Apply linear programming, simulation modelling, network modelling and decision analysis tools to complex quality management processes using specialized software.

Prerequisite: STS 3113

**MRK 1103 - Principles of Marketing (3-1-3)**

Introduces the basic concepts of Marketing, develops an understanding of the overall process of marketing including the research, planning, implementation and control of marketing activities in the contemporary business environment. The main emphasis is on the practical application of marketing concepts covered in the course, using UAE consumer products as examples.

**MRK 2003 - Consumer Behaviour (3-1-3)**

Relates the theory of consumer behaviour to the practice of marketing. Drawing from psychology and the social and behavioural sciences consumer decision making processes and its influencing factors is examined.

Prerequisite: MRK 1103

**MRK 2103 - Marketing Metrics (3-1-3)**

Marketing metrics are quantitative measures that allow marketers to evaluate their performance against organizational goals. Introduce the different tools used to analyze consumer data and measure marketing expenditure and ROI, determine the appropriate metrics to use in different businesses, and develop marketing measurement systems that add value to firms.

Prerequisite: MRK 2003

**MRK 3003 - Integrated Marketing Communications (3-1-3)**

Introduces the fundamental principles of Integrated Marketing Communications (IMC). Explains and applies the IMC planning process leading to consistent communications strategy of a brand. Develops an in-depth understanding of a range of traditional communication tools as well as digital media. Creates the necessary skills to apply the various communications elements to a brand. Evaluates the effectiveness of the IMC plan and generates recommendations.

Prerequisite: MRK 2103

**MRK 3013 - Marketing Research (3-1-3)**

Provides a practical understanding of how market research is conducted and managed. Covers the stages of the marketing research process from problem definition to the reporting of results with a particular focus on learning how to use common market research tools. Effectively plan, organize and manage market research projects, as well as conduct basic data analysis.

Prerequisite: MRK 2103

**MRK 3103 - Brand Management (3-1-3)**

Explore the issues and challenges commonly faced by brand managers. Topics include an introduction to brands and brand management, identifying and establishing brand positioning and values, planning and implementing brand marketing programs, measuring and interpreting brand equity, and growing and sustaining brand equity. Provides theoretical and practical knowledge necessary for successful brand management.

Prerequisite: MRK 2003 and MRK 2103

**MRK 3113 - Digital Marketing (3-1-3)**

Covers new media marketing, including social, mobile, and search, is revolutionizing how marketers operate and the skills they need to be successful. Examines the power of applying digital concepts across marketing functions and how digital marketing is becoming a driver of marketing strategy.

Prerequisite: BIS 3003

**MRK 4003 - International Marketing Management (3-1-3)**

Develops understanding of how international marketing enhances the global competitiveness of a business. Through the analysis and evaluation of factors explains how marketing makes a business more competitive in dynamic global markets. International marketing principles are applied to product, service and country specific situations. Marketing skills and plans that are required for a business to strategically move into a foreign country are developed.

Prerequisite: MRK 3003

**MRK 4013 - Strategic Marketing (3-1-3)**

Examines the impact of contemporary issues on marketing management planning, and strategy formulation within a complex business environment. Critically evaluate the implications of specific decisions and assess various options in making strategic marketing decisions. Through innovative marketing solutions, to brand and market development, recommend strategic developments to enhance competitive advantage and positioning in relation to fluctuating consumer behaviors.

Prerequisite: MRK 3003

**MRK 4023 - Customer Relationship Management (3-1-3)**

Covers the fundamental concepts and the usefulness of customer relationship management (CRM) and its associated methods. Focuses on CRM application in marketing, sales, and service. Effective CRM strategies help companies align business process with customer centric strategies using people, technology, and knowledge. Explores the benefits of creating customer loyalty, developing market intelligence and embedding a customer relationship management system into an organization.

Prerequisite: MRK 3103

**MRK 4033 - Digital Tools and Techniques (3-1-3)**

Apply various digital tools and techniques to develop successful marketing campaigns. Evaluate digital tools. Evaluate digital tools used to understand and satisfy customer needs. Digital media campaigns that lead to increased customer engagement will be developed.

Prerequisite: MRK 3113

**MRK 4103 - Services Marketing (3-1-3)**

Examines the nature of services and the challenges in marketing services (locally and globally). Explores and uses the services marketing mix. It also explores how business organizations can deliver efficient service. In addition, key concepts in measuring service are defined and recommendations for service managers are provided.

Prerequisite: MRK 3103

**MRK 4113 - Data- Driven B2B Marketing (3-1-3)**

Provides a practical understanding of what Data-driven B2B marketing is and how it is applied. Covers how and why to build a B2B marketing database, how to source data and use it, and how to manage that data. The key applications that generate business value are covered as well in this course. The ability to successfully build and use a marketing database is crucial for business intelligence, business opportunity, marketing communications and customer retention.

Prerequisites: MRK 2103 and MRK 4013

**MRK 4123 - Social Media and Mobile Marketing (3-1-3)**

Study a range of skills needed to become a mobile marketing specialist, and design a targeted digital marketing plan in the mobile context. Applies the four zones of Social Media Marketing to a brand. It defines the Social Media Marketing planning process and how it fits the overall organizational planning. Develops an in-depth understanding of consumers, and of how segmentation and targeting of consumers has changed with the use of social media.

Prerequisite: MRK 4033

**MRK 4203 - Marketing Research Project (3-1-3)**

The final semester project studies a range of skills needed to become a mobile marketing specialist, and design a targeted digital marketing plan in the mobile context. Applies the four zones of Social Media Marketing to a brand. It defines the Social Media Marketing planning process and how it fits the overall organizational planning. Develops an in-depth understanding of consumers, and of how segmentation and targeting of consumers has changed with the use of social media.

**MTE 2403 - Thermofluid Systems (3-1-3)**

Covers properties of pure substances and ideal gases through the application of the ideal gas equation of state, property diagrams and the use of tables. Studies energy transfer and its conversion, and principles of fluid mechanics and thermodynamics. Introduces the continuity principle and energy conservation law in an incompressible steady flow processes, and energy balance for closed systems and open systems. Includes selected laboratory experiments covering main concepts of the subject.

Prerequisites: CHM 1103 and PHY 1103

**MTE 2602 - Mechatronics Measurements and Troubleshooting (1-3-2)**

Covers basic measurement techniques of the common industrial variables (plant parameters), naming pressure, flow, temperature, linear displacement, etc., and evaluate different sensors / transducers for proper control action. It also covers troubleshooting of mechatronic systems in industrial settings. Includes use of software packages and laboratory experiments.

Prerequisites: ELE 2153 and MCE 2223

**MTE 2903 - Sophomore Design Project (2-3-3)**

Learns how to propose, design, plan and implement a capstone engineering project. Integrate and apply technological, organizational, communication, simulation, and interpersonal skills for safe implementation, documentation, and presentation skills. Evaluate a team on its ability to coordinate efforts to propose the project design criteria, major components, resources, systematic design, implementation schedule, and estimated cost. Hazards identification and control. Discuss environment protection and safety training.

Prerequisites: MCE 2203, MCE 2303, MCE 2311 and ELE 2153

**MTE 3503 - Electronics Product Design (2-3-3)**

Covers computer aided circuit design with CAD tools. Includes modeling and simulation of electronic circuit, rapid prototyping, PCB design and PCB layout. Includes project on embedded system based product with communication, networking, and affecting the environment, laboratory experiments and projects on interfacing and integrating electronic product components hardware circuit on PCB.

Prerequisites: MTE 3603 and EGN 2712

**MTE 3603 - Electronics Systems and Circuits (3-1-3)**

Introduces the application of digital and linear semiconductor devices in addition to basic combinational and sequential circuits including minimization techniques. In the linear circuits, students will study operational amplifiers characteristics and their applications.

Prerequisites: MTE 2602

**MTE 3611 - Electronics Systems and Circuits Lab (0-3-1)**

Covers laboratory work for the MTE 3603, and in this course students will build and test combinational logic circuits, sequential logic circuits and analog circuit applications using diodes, thyristors, BJT, JFET, and MOSFET. Includes projects on control circuits utilizing operational amplifiers. Lab experiments are designed to help students design, simulate and hardware implementation of circuits.

Corequisite: MTE 3603

**MTE 3623 - Microcontroller Systems (2-3-3)**

Introduces concepts and practices of microcontrollers and their application to the control of electromechanical devices and systems. The hardware and software architecture of a typical microcontroller is described and used as a basis for the implementation of programs and interfacing. Top-down design is applied to implement solutions using on-board peripherals, and various modules for a selected range of applications. Practical laboratories and mini-projects are utilized to reinforce concepts.

Prerequisites: MTE 3603 and EGN 2712

**MTE 3633 - Sensors and Actuators (2-3-3)**

Covers sensors and transducers in addition to electromechanical, electro-pneumatics and hydraulics actuators. Sensors and transducers covered include: analog and digital motion sensors; optical sensors; temperature sensors; magnetic and electromagnetic sensors, torque, force and tactile sensors. Actuators covered include: stepper motors, DC and AC motors, hydraulic and pneumatic actuators, magnet and electromagnetic actuators. Introduces programmable logic controllers. Includes use of CAD tools and laboratory experiments.

Prerequisites: MTE 3603 and EGN 2712

**MTE 4503 - Design of Mechatronic Systems (3-1-3)**

Covers synergetic integration of electronics, mechanics, PLC and computer control, pneumatics, hydraulics, sensors and Actuators, basics of Dynamic Systems Modelling, Data Acquisition and Virtual Instrumentation, and PC-Based and Embedded Controllers, Computer Simulation. Applications illustrated by numerically and experimentally generated results. Includes Laboratory experiments and mini-projects on smart product design

Prerequisites: MTE 3623, MTE 3633 and MCE 4603

**MTE 4603 - Robotics Technology (2-3-3)**

Covers mechanical components, transducers, and actuators of industrial and mobile robots. Specifically, a hands-on approach is used to explore robotic embedded systems, associated modelling, programming, and control. The fundamental concepts describing robotics operation including coordinate transformations, kinematics and trajectory planning, motion analysis and control, sensor and actuator selection are introduced.

Prerequisites: MTE 3623, MTE 3633 and MCE 4603

**MTE 4613 - Industrial Control Systems (2-3-3)**

Provides overview of the fundamental systems and concepts of computer control with application to modern industry and manufacturing. Describe control system layout, components, various network topologies and protocols. Model, simulate by MATLAB/Simulink, and/or LabVIEW, and analyze the response of a specified, closed-loop, computer-controlled, control system. Design and implement a computer-controlled system using appropriate hardware and software components.

Prerequisites: MTE 4603 and MTE 4643

**MTE 4623 - Industrial Automation (3-1-3)**

Introduces basic control systems such as hydraulics and pneumatics motion controllers, PLCs programmable controllers, sensors and vision systems, robotics to design a computer integrated manufacturing (CIM) cell. Hands-on, team based, activities covering the case studies on the design of manufacturing automation systems using both hard automation and robots used in a CIM cell high-end automation system.

Prerequisites: MTE 4603 and MCE 2213

**MTE 4633 - Process Control (2-2-3)**

Introduces Process Control technologies associated with a complex mechatronics system. Topics include Closed Loop Control; interaction between controllers, sensors and actuators; controller operating parameters and PID controllers; Key concepts in automatic control and instrumentation of process plants including control diagrams, symbols, concepts, and operation of industrial based control system and simulation programs. Optimization Techniques and Supervisory Control. Case studies including supervisory control and data acquisition systems, distributed control systems and PLCs.

Prerequisites: MCE 4603 and MTE 2403

**MTE 4643 - Digital Control Systems (3-1-3)**

Covers components of computer control systems, design and analysis of digital controllers. Introduces A/D and D/A, Signal sampling and reconstruction, signal conditioning, anti-alias filters, Discrete time systems, Z-transforms and their properties, digital control design, digital PID control. CAD tools such as MATLAB, and/or LabVIEW are introduced to analyze the response of a specified, closed-loop, computer-controlled control system. The course includes realization of digital control systems practical implementation.

Prerequisites: MTE 3623 and MCE 4603

**MTE 4653 - Real Time Embedded Systems (3-1-3)**

Covers programming embedded systems and build basic projects using a microcontroller based kit. Topics will cover hardware level programming in high level language, interfacing on-board peripherals, digital and analog I/O, and bus communication. Real time operating system concepts pertaining to embedded systems are discussed. Hands-on experience completing small hardware projects using microcontroller based kit is emphasized.

Prerequisites: MTE 3623, MTE 3633 and MCE 4603

**MTE 4863 - Special Topics in Mechatronics Engineering (3-1-3)**

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

**MTE 4893 - Directed Study (3-1-3)**

Provides an opportunity to investigate under faculty supervision beyond what is offered in existing courses.

**MTE 4902 - Capstone Design Project I (1-3-2)**

Capstone final year design project requires the formation of a team to propose, plan and design an engineering product. The student team is totally responsible for the completion of the project milestones and course objectives while working under the mentorship of a faculty or industry engineer. The team is evaluated on its ability to coordinate efforts to propose the project design criteria, components, resources, implementation schedule, and estimated cost.

**MTE 4912 - Capstone Design Project II (1-3-2)**

Covers implementation, evaluation, and analysis of the capstone engineering project. Integrate and apply technological, organizational, communication, and interpersonal skills for safe implementation, documentation, and presentation skills. Includes health, safety and environment report documentation discussing environment protection, accident prevention, effective committee operations, accident investigation and safe working practice for artifact fabrication to form the basis for assessment.

Prerequisite: MTE 4902

**MTH 1103 - Pre Calculus (3-1-3)**

Provides the student with background mathematical skills essential for progression to the study of calculus and further higher mathematics courses. Topics include functions, linear functions, exponential and logarithmic functions, transformation of functions, trigonometric functions, composite inverse and combination of functions, polynomial and rational functions, and complex numbers. A free multi-platform dynamic mathematics software as Geo-Gebra is used to allow students to visualize and manipulate various problems.

Prerequisite: FND M030

**MTH 1113 - Statistics for Engineering (3-1-3)**

A standard approach to statistical analysis mainly for engineering students. Understand: Basic statistical concepts; graphs; basics probability; discrete distribution; expectations; Binomial and Normal distributions with their applications. Point and Confidence interval estimations; testing hypotheses; regression and correlation.

Prerequisites: MTH 1103.

**MTH 1203 - Calculus I (3-1-3)**

Apply the concepts of trigonometry and algebra to determine limits and establish continuity for an equation. Calculate the derivative of algebraic, trigonometric, logarithmic and exponential functions. Apply the derivative to optimisation of problems. Determine the maxima and minima of a function. Create graphs to solve problems

Prerequisite: MTH 1103

**MTH 2103 - Calculus II (3-1-3)**

Apply Integral Calculus and associated applications to solve engineering problems. Determine the sums, indefinite and definite integrals, integration techniques, parametric equations and polar coordinates, application of integration, and an introduction to numerical integration techniques.

Prerequisite: MTH 1203

**MTH 2503 - Linear Algebra and Differential Equations (3-1-3)**

Solve systems of linear equations, matrices, and first order differential equations; existence and uniqueness; second order differential equations; Laplace transform and its use in differential equations; and simple partial differential equations. The systems of linear equations and matrices, Gaussian elimination, matrix operation, inverse, linear transformation, Eigen values and Eigen vectors are applied to appropriate equations.

Prerequisite: MTH 2103

**MTH 3013 - Calculus III (3-1-3)**

Apply hyperbolic functions and their inverse to solve complex functions. Solve problems requiring Taylor, Maclaurin and Fourier series, operations with vectors dot and cross products, lines and planes. Functions of several variables, partial derivatives, double and triple integrals, moments, center of mass, volumes, double integrals in polar forms, triple integrals in cylindrical and spherical coordinates, line integrals and Green's theorem are also covered.

Prerequisite: MTH 2103

**MTR 1013 - Fundamentals of Marine Navigation (2-2-3)**

Covers basic concepts of marine navigation in addition includes the fundamentals of coastal and ocean navigation. Introduces knowledge of skills and knowledge to plot positions to a level appropriate in order for him to be able to assist the officer of the watch in the safe navigation of the vessel. It meets the competency standards stipulated in Table A-II/1 of STCW Convention.

**MTR 1023 - Maritime Industry Overview (3-1-3)**

Introduces the maritime industry to students with emphasis on the shipping sector. It includes introduction to maritime organisations, vessel design and categorization, vessel operations, and rules and regulations governing shipboard operations. It meets the competency standards stipulated in Table A-II/1 of STCW Convention.

**MTR 1033 - Nautical Knowledge (2-2-3)**

Covers information and guidance to work on board vessels. It provides basic seamanship and shipboard communication skills and introduces concepts of safe watchkeeping to students so that they could play a supporting role to the officer of the watch during their seagoing training period. This course meets the competency standards stipulated in Table A-II/1 of STCW Convention.

**MTR 1210 - Shipboard Support-Level Experience (10-15-10)**

Provides the opportunity to students to undertake training at sea under the supervision of an officer on board the vessel. A detailed record of learning will be kept which will be assessed by HCT staff. The material will include Shipboard Familiarisation, Seamanship, Equipment, Watchkeeping, Navigation, and Ship Knowledge.

Prerequisites: MTR 1013, MTR 1023 and MTR 1033

**MTR 2003 - Marine Physical Science (3-1-3)**

On completion of this course, the student will have gained the knowledge of the physical science principles which determine the behaviour of a ship in relation to its design, load condition and the environment in which it operates and, the operation of shipboard equipment.

Prerequisite: PHY 1103

**MTR 2012 - Shipboard Operational Leadership (2-1-2)**

Engage in practical work experience which provides students with the knowledge, skills of leadership and teamwork at the operational level on board a ship. It meets the competency standards stipulated in Table A-II/1 of STCW Convention and the requirements of IMO Model Course 1.39: Leadership and Teamwork.

Corequisite: MTR 1210 or MET 1210

**MTR 2102 - Ship Regulation and Survey (2-1-2)**

Covers knowledge of the laws and regulations that govern the shipboard safety and operations with particular emphasis on ships survey and inspection. It meets the competency standards stipulated in Table A-II/1 of STCW Convention.

Corequisite: MTR 1210 or MET 1210

**MTR 2103 - Ship Operational Safety (3-1-3)**

Covers the fundamentals with skills and knowledge to take measures safely enter a confined space, apply International Safety Management (ISM) procedures on board, act promptly and correctly in a damage/flooding situation on board and follow safe working practices on board including when bunkering. The course meets the competency standards stipulated in Table A-II/1 of STCW Convention.

Corequisite: MAR 1110 or MTR 1210

**MTR 2203 - Near-Coastal Navigation (3-1-3)**

Covers the fundamentals with the skills and knowledge required to plan and conduct a safe navigational passage and, to determine the vessel's position and plot it on a navigational chart. It builds on the knowledge gained in 'MTR 1013' and meets the competency standards stipulated in Table A-II/1 of STCW Convention. Students will undertake a variety of chartwork exercises covering a range of shipboard navigational scenarios.

Corequisite: MTR 1210 or MAR 1110

**MTR 2303 - Ship Characteristics and Maintenance (3-1-3)**

Includes an insight into vessel design, and aims to build on the knowledge gained from MTR 1023. Covers practical aspects of vessel design, including purpose of key features, vessel types and their principal design differences, and the function of machinery. Includes shipboard repair and planned maintenance procedures. This course meets the competency standards stipulated in Table A-II/1 of STCW Convention.

Corequisite: MTR 1210

**MTR 2314 - Marine Navigational Watchkeeping (3-2-4)**

Integrates watchkeeping theory and case studies with practical application and problem solving exercises involving the use of the marine simulator. It builds on the knowledge gained in MTR 1033 Nautical Knowledge and MTR 1210 Shipboard Support-Level Experience, and meets the competency standards stipulated in Table A-II/1 of STCW Convention.

Prerequisite: MTR 1210

Corequisites: MTR 2003 and MTR 2324

**MTR 2324 - Marine Electronic Navigation (3-2-4)**

Explore the knowledge and skills required to safely maintain a navigational watch through use of various electronic navigation systems on a vessel. The competency standards stipulated in Table A-II/1 of STCW Convention is met. It includes the setting up and initialisation of electronic navigation instruments such as radars, GPS and Automatic Identification systems. Includes terminology and operating principles and the ability to interpret the data produced by instruments with allowances made for their limitations and errors.

Prerequisites: MTR 1210 and MTR 2203

Corequisite: MTR 2003

**MTR 2332 - Ship Manoeuvring and Control (1-2-2)**

Provides the students with the knowledge and skills required to control a power driven vessel as officer of the watch, including basic handling and manoeuvring of the vessel under normal operations when berthing, mooring and anchoring. Builds on the knowledge gained in year 1 and meets the competency standards stipulated in Table A-II/1 of STCW Convention.

Prerequisite: MTR 1210

**MTR 3010 - Shipboard Operational-Level Experience (10-15-10)**

Engage in practical work experience under the supervision of the shipboard training officer while the student is at sea. A detailed record of tasks undertaken and duties performed under the direction of ships officers will be kept in a training record book (TRB), dated and signed by the supervising officers. This TRB together with a number of project work and assignments will be assessed for completion by HCT staff at the end of the following semester. The TRB covers Seamanship, Equipment, Watchkeeping Practice, Navigation, and Cargo Operations.

Prerequisite: MTR 1210

**MTR 3013 - Marine Weather Watchkeeping (3-1-3)**

Present with skills and knowledge required to demonstrate a comprehension of weather systems encountered at sea and observe, interpret and record the state of the marine environment and use this information for safe navigation. It builds on the knowledge gained in MTR 1033 Nautical Knowledge and, meets the competency standards stipulated in Table A-II/1 of STCW Convention.

Corequisite: MTR 1210

**MTR 3023 - Marine Transport Operations (3-1-3)**

Covers the basic aspects with the skills and knowledge required to supervise the safe handling, stowage and carriage of cargoes including dangerous goods and the care of passengers on board a variety of vessels, in accordance with the international regulations and best practice.

Corequisite: MTR 1210

Prerequisite: MTR 1033

**MTR 3033 - Electronic Chart Display and Information System (ECDIS) (2-2-3)**

Introduce the knowledge and skills necessary to fully utilise the features of ECDIS in order to enhance safety of navigation. It meets the competency standards stipulated in Table A-II/1 of STCW Convention and IMO Model Course 1.27: The Operational Use of ECDIS.

Prerequisite: MTR 2003, MTR 2314 and MTR 2324

**MTR 3103 - Ship Stability and Stress (3-1-3)**

Apply the basics of stability of vessels to enable seagoing officers to understand issues associated with loading, unloading and moving of weights on board. The course builds on the knowledge gained in 'MAR 1023 Maritime Industry Overview' and, meets the competency standards stipulated in Table A-II/1 of STCW Convention. It will provide the students with skills and knowledge required to calculate static stability of a ship while acknowledging the importance of dynamical stability and demonstrate a comprehension vessel's stress.

Prerequisites: LSM 1103, MTR 1210 and MTR 2003

**MTR 3113 - Ocean Navigation (3-1-3)**

Introduce the skills and knowledge required to determine courses and distances on the earth's surface to fix the ship's position by observation of celestial bodies. It meets the competency standards stipulated in Table A-II/1 of STCW Convention. Includes spherical trigonometry, determination of astronomical events, knowledge to calculate compass error by celestial bearings. The difficulties encountered when navigating in high latitudes will also be covered. .

Prerequisites: LSM 1103 and MTR 1210

**MTR 4010 - Shipboard Management-Level Experience (10-15-10)**

Engage in practical work experience undertaken under the supervision of the shipboard training officer while the student is at sea. It meets wholly the requirements of the STCW Convention for the training of deck officers at Management Level and will prepare the student for Management Level studies.

Prerequisites: MTR 2012, MTR 2102, MTR 2103, MTR 2203, MTR 2303, MTR 2314, MTR 2324, MTR 2332 and MTR 3010

**MTR 4024 - Leadership in Shipboard Management (4-1-4)**

Present knowledge and skills that a senior officer requires to organise the efficient running of a merchant ship, with emphasis in leading and managing multicultural crews and maintaining an effective interface with other industry stakeholders. It includes the concept of leadership; and the importance of vision, motivation and communication. Selected leadership theories and styles are included and examples which apply to senior officers at sea given.

Prerequisites: MTR 2012 and MTR 3010

**MTR 4114 - Marine Environmental Dynamics (4-1-4)**

Explain in detail with the knowledge and skills to be able to forecast weather and sea conditions with particular emphasis on avoidance of potentially dangerous weather conditions and formulate reasoned questions concerning environmental and climate issues. It expands on the basic concepts of meteorology introduced in MAR 2603 Marine Weather Watchkeeping and, meets the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisites: MTR 3010 and MTR 3013

**MTR 4124 - Advanced Techniques in Marine Navigation (4-1-4)**

Gain relevant concepts and principles underlying various methods of position fixing, and evaluation of the quality of position fixes. It encompasses the study of different models of the shape of the earth, the understanding of nautical astronomy, use of information to predict tidal heights and times and in-depth study of errors and limitations of the ship's compasses. Students will also be introduced to statistics. This course meets the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisites: MTR 2203, MTR 3010 and MTR 3113

**MTR 4133 - Ship Design and Seaworthiness (3-1-3)**

Covers knowledge and skills required to maintain and operate their vessels in a safe and seaworthy condition and to be able to understand and manage consequences related to main propulsion and auxiliary machinery malfunction. It complies with the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisites: MTR 2303 and MTR 3010

**MTR 5003 - Ship Operations Project (2-2-3)**

An appropriate project will be chosen by the student with guidance from relevant faculty members. Undertaking the project will integrate many of the skills and knowledge obtained during the program and develop independent learning. Students are expected to submit, and defend, their project in the presence of their peers, and faculty members.

Corequisites: LSS 1123 and MTR 4010

**MTR 5004 - Shipboard Commercial Operations (4-1-4)**

Covers knowledge of the legal framework within which a ship operates, essential aspects of the shipping business environment and an understanding of shipping economics and its risks. Covers deadweight and draught survey calculations. It fulfills the competency standards stipulated in Table A-II/2 of STCW Convention.

Corequisites: MTR 4010 and MTR 5024

**MTR 5014 - Maritime Law and Ship Protection (4-1-4)**

Covers knowledge of the legal framework within which a ship operates. Understanding the important international maritime legislation, along with their application to management of ship operations. An insight into marine insurance risks involved with shipping is given. Knowledge with extensively with survey and certification of ships. This course meets the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisite: MTR 2102

Corequisite: MTR 4010

**MTR 5023 - Ship Administration (3-1-3)**

Guide students for command of vessels. The duties of the master are covered, along with various leadership strategies to best meet the challenges of leading and shaping a diverse group of officers and crew on a vessel. In addition, the differences between shipboard command and senior leadership positions ashore are discussed and, the leadership skills and techniques to be employed in a variety of on board emergency situations are covered.

Corequisite: MTR 4010

**MTR 5024 - Marine Transport Management (3-1-4)**

Covers knowledge and skills necessary to safely load, carry, care and unload a variety of cargoes from a majority of vessel types. Covers procedures for and best practices of safe cargo handling in accordance with the provisions of the relevant legislation, including IMDG Code; IMSBC Code; and MARPOL with emphasis on the carriage of dangerous, hazardous and harmful cargoes. It meets the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisite: MTR 3023

Corequisite: MTR 4010

**MTR 5105 - Ship Stability and Dynamics (5-1-5)**

Focuses on the conceptual knowledge and practical application of ship stability. Able to control and manage the stability of the vessel while at sea and in port and to increase the safety and proper care of the vessel, its cargo and crew. Advanced concepts, including damaged stability. Includes progressive flooding; transverse stability; sinkage and trim; and residual stability after damage. Other issues such as dry docking and stability when aground are also covered.

Prerequisites: MTR 3103 and MTR 4010

**MTR 5124 - Shipboard Command Operations (4-2-4)**

Covers detailed knowledge and skills necessary to handle large power driven vessels safely on passage and in and out of port in extreme weather conditions and emergencies. Covers emergencies involving steering and towing and includes berthing, un-berthing and anchoring under various weather conditions. Requirements meet the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisites: MTR 2332 and MTR 4010

Corequisite: MTR 5125

**MTR 5125 - Marine Navigation Management (4-3-5)**

Engages skills and knowledge to plan and manage a voyage using advanced navigational techniques and to lead and manage the bridge team under differing circumstances including search and rescue scenario. The course meets the competency standards stipulated in Table A-II/2 of STCW Convention.

Prerequisites: MTR 2314, MTR 2324, MTR 2332 and MTR 4010

**MTS 1002 - Leadership (2-1-2)**

The course of leadership is aimed at developing the leadership proficiency in cadets, and how to overcome leadership problems besides the requirements throughout his roles that involve leadership. This program includes: the general nature of leadership, human behavior, characteristics of leadership, a guide to proper leadership, leadership obstacles and solutions, leadership in battle field, leadership in high ranks, a practical application to leadership roles.

**MTS 1102 - Staff Duties (1-2-2)**

Designed to teach cadets the basics principles of the military writing and correspondence, military abbreviations, and operations orders. This course includes: the principles of military writing and correspondence, telegrams, orders, standard module for operations order, military abbreviations. The course also includes practical exercises.

**MTS 1112 - Topography (1-2-2)**

The topography course aims at training cadets to read and use land navigation maps, compasses and GPS to navigate on the ground. The course includes different types of maps, geographic coordinate systems, land navigation, military protractor, map guidance, finding places, the exchange of visions, aerial photographs, and using GPS. Practical exercises are also organized to provide experience of night marching, and using the compass, military protractor, and GPS.

**MTS 1123 - Air Force History and Organisation (3-1-3)**

The course provides the students with an appreciation of the historic development of Air Power and the UAE Air Force into the current modern Air Force and Air Defence organisation. The students then examine the current structures, organisation and roles of the Air Force and Air Defence and the contribution towards national security. Intelligence and Security, Command and Control, Operational Assets and future developments are all discussed

**MTS 2103 - Aircraft Weapons Systems (2-2-3)**

This course is an introduction to the types, specification and effects of commonly employed aircraft weapons systems and examines the advanced weapons and guidance systems. The course covers a wide range of weapons systems and external pods that are used to achieve a wide range of military missions such as Air-To-Air missions, SEAD missions or Air-To-Surface missions. Particular attention will be placed on the trends of development of modern aircraft weapons.

**NAV 1104 - Navigation I (4-1-4)**

Designed to provide students with elementary theoretical knowledge of general navigation and International Regulations for preventing collision at sea. This course will cover topics such as basic navigation terms, navigational charts and methods of fixing, tides and tidal streams theory, use of navigational aids and the uniform time system. Students will be familiarized with the use of navigation publications, as well as international regulations relating to sailing under various scenarios and conditions.

**NAV 2004 - Navigation II (4-1-4)**

The course aims at providing students with in-depth theoretical knowledge of Navigation. Upon completion of the course, the students are expected to be familiar with the marine navigation, passage planning, pilotage and blind pilotage, execution of anchoring and usage of various navigational aids. During this course, the students will also be familiarized with the International Regulations for Preventing Collision at Sea.

Prerequisite: NAV 1104

**NAV 2104 - Navigation III (4-1-4)**

Provides the students with in-depth knowledge in chart work and Astro Navigation theory for practical application at sea. Covers topics such as use of basic Astro Navigation related books and publications, prediction of rising and setting times of various heavenly bodies, calculation of gyro compass and observed position by means of the reduction of sun. Comprehensive knowledge about chart work to solve time distance problems is developed in the course.

Prerequisite: NAV 1104 & NAV 2004

**NAV 4003 - Navigation Team Training (2-2-3)**

Students will build upon previous courses to hone their pilotage skills as part of an integrated bridge team. Rotating to all roles and positions in both the simulator and the charthouse will expose students to every facets of the team operation enhancing understanding when in the leadership role.

Prerequisite: NAV 4033

**NAV 4014 - Ocean Navigation (2-4-4)**

Students will be required to safely navigate a ship and correctly apply the collision avoidance regulations in open water conditions. This will include the application and evaluation of GPS as well as the ship's log and echo sounder. Students will also need to apply steering and sailing rules applicable to open water navigation; including the analysis shipping situations through synthesizing electronic aids such as AIS and radar with visual observation.

Prerequisite: NPS 4003

**NAV 4023 - Coastal Navigation (2-2-3)**

Students will be required to safely navigate a ship and correctly apply the collision avoidance regulations in coastal waters and in restricted visibility. This will include the use of terrestrial fixing and radar navigation techniques. Students will also need to respond to vessels and aircraft in distress.

Prerequisite: NAV 4014

**NAV 4033 - Restricted Waters Navigation (2-2-3)**

Students will be required to safely navigate a ship and correctly apply the collision avoidance regulations in restricted waters. This includes the planning and execution of anchorages. This requires the synthesis and application of bridge equipment, visual observations and navigation theory. Student also need to evaluate anchorage positions and weather conditions.

Prerequisite: NAV 4023

**NPS 2004 - Seamanship I (3-1-3)**

The course aims at providing the students with theoretical knowledge of basic seamanship terms, rope work, rigging, practical handling of boat work and Anchor work. On completion of this course the students are expected to become familiar with basic seamanship terms and definitions, various parts of ship, types of anchors, working on anchors and cable, basic rope work, use of bends, hitches and berthing hawsers.

**NPS 2013 - Naval Communications (2-2-3)**

Students will be provided with in-depth theoretical and practical knowledge of Naval Communication in preparation for practical application at sea and ashore. This course will introduce Naval communication publications, flags, flashing light and maneuvering board. The classroom instructions will be followed by practical of Naval Communication systems, visual and Naval message procedures and tactical maneuvering to control the force at sea during sea training.

**NPS 2103 - Naval Leadership and Management (3-1-3)**

This course will provide students with an in depth theoretical knowledge of leadership theories, giving special attention to how each theoretical approach can be applied in a naval environment. Initially students will be introduced with concept of leadership including importance of vision, communication and motivation in the leadership. They will also learn about the concept of leadership from Islamic point of view vis-à-vis leadership theories, importance of individual attribute, competency of a leader in effective problem solving.

**NPS 2113 - Seamanship II (3-1-3)**

The course is designed to further build upon the initial Seamanship knowledge gained by the students during Semester III. The course aims at providing the students with theoretical knowledge of Seamanship which include Life Saving Equipments used onboard, Towing, Replenishment at Sea (RAS), Naval ceremonies, Ship's Husbandry and Ships steering and Conning Orders, responsibilities of Officer of the Watch at sea and in harbour. Upon completion of this course the students are expected to become familiar with various aspects of sea life.

Prerequisite: NPS 2004

**NPS 3003 - Midshipman Sea Time - Seamanship (0-6-3)**

The course aims at providing practical training to midshipmen related to general seamanship, ship's husbandry, anchor work, mooring, boat work, towing and replenishment and Rigging onboard a warship. This will be based on the theoretical benchmark set for students in the Naval College. The course is primarily designed to impart practical training through attachment with the Executive department onboard ship.

Prerequisites: NPS 2004 and NPS 2113

**NPS 3013 - Midshipman Sea Time - Navigation (0-6-3)**

The course aims at providing midshipmen practical manifestation with regards to Navigation knowledge gained at RBSAM. The course is divided into four main sections which include General Navigation, Bridge knowledge and organization, Officer of the Day (OOD) duties and responsibilities, Officer of the Watch (OOW) duties and responsibilities and practical tasks pertaining to different bridge emergencies and astro navigation. It also provides hands on training using Fleet Work Simulator in order to enhance their practical knowledge further.

Prerequisites: NAV 1104, NAV 2004 and NAV 2104

**NPS 3023 - Midshipman Sea Time - Naval Engineering (0-6-3)**

The course aims at providing practical training to midshipmen related to Marine Engineering, Logistics and Nuclear Biological Chemical and Damage control (NBCD) onboard a warship based on the theoretical knowledge acquired by the students at Naval College. The course is primarily designed to impart practical training through attachment with Engineering and Logistics departments? onboard ship.

Prerequisites: NSE 1013, NSE 2043, NSE 2103 and NSE 2033

**NPS 3033 - Midshipman Sea Time - Naval Operations and Communications (0-6-3)**

The course aims at providing practical training to midshipmen related to Naval Ops and Communications onboard ship based on the theoretical knowledge gained at Naval College. The course is primarily designed to impart practical training through attachment with Operation Department onboard ship.

Prerequisites: NWR 1103, NWR 2103 and NPS 2013

**NPS 3043 - Midshipman Sea Time - Fleet Work Simulator (0-6-3)**

This course is a part of the sea training phase, this is aimed at providing practical training to midshipmen on the shore-side Fleet Work Simulator situated in RBMS Naval College. The course is primarily designed to consolidate theoretical knowledge through practical training in WEDICS, GMDSS, RADAR Fleet Work Simulator and NTPRO 5000. It also imparts knowledge of the Simulator itself, for future reference.

Prerequisites: NWR 1103, NAV 1104, NAV 2004, NPS 2013, NAV 2104 and NWR 2103

**NPS 4003 - Bridge and Ship Systems (2-2-3)**

Students will be given training in the operation and procedures for radar, AIS, ECDIS, GMDSS, steering and control systems. This includes being able to control and steer the ship as Officer of the Watch and Helmsman respectively. Students will be expected to master each technology and to synthesize all elements collectively to keep a watch and apply their knowledge to real world situations through the use of a bridge simulator.

**NPS 4124 - Communications and Intelligence (2-4-4)**

Students will be required to communicate via flashing light employing Morse code and communicate via voice and text using both GMDSS and military equipment. Furthermore, students will be required to encode and decode tactical Manoeuvring, common operational and admin signals. With respect to Manoeuvring signals, the students will correctly report and execute turns, wheels and formations.

**NPS 4133 - Capstone Project (0-6-3)**

Students will be required to research, prepare and brief first the feasibility of a proposed passage of a ship from one destination to another, then an outline plan of this passage culminating in a full navigation plan to a qualified CO or Navigator. The series of assignments will include demonstration of signal and letter writing skills through the production of accompanying signals and correspondence.

Prerequisites: NPS 4003, NAV 4014 and NPS 4124

**NSE 1003 - Fluid Mechanics for Naval Applications (3-1-3)**

This course will provide basic understanding of the principles of fluid mechanics, fluid properties, pressure measurements and its applications. The students will also learn about the concept of buoyancy and stability as applied to naval ships. In addition, students will be familiarized with the concept of continuity, energy conservation equations and their practical applications.

Prerequisite: PHY 1103

**NSE 1013 - Ship Structure and Damage Control I (3-1-3)**

The course aims at providing the students with the knowledge about the ship structure, materials used in Naval ship construction and guide lines for basic ship design and construction process. The course also covers basic knowledge of Nuclear, Biological and Chemical Defence and Damage control including Fire Fighting (NBCD) onboard warships encompassing basic concepts of NBCD and basic terminology related to NBCD. It also gives detailed information about the basics of Nuclear, biological and chemical warfare and defence against NBC attacks.

**NSE 2003 - Ship Electrical Technology (3-1-3)**

This course is designed to introduce the basic principles of electrical and electronic circuits as applied to modern naval ships. Topics include DC, and AC circuits, Kirchhoff's laws, three-phase power systems, semiconductor devices, logic circuits, the operation of machines and Power and Distribution System.

Prerequisite: PHY 1103

**NSE 2013 - Principles of Naval Sensors (3-1-3)**

The course is designed to introduce the basic concepts of Naval Sensors, and their applications to naval operations and warfare. It starts with the definitions and concepts of Radio and Sound waves, and their propagation mechanisms. Various types of Radars, Sonars, and Electrooptical sensors are described. Their applications are explained to familiarize the students to the roles of these sensors in naval scenarios.

Prerequisite: PHY 1103

Corequisite: NSE 2003

**NSE 2023 - Maritime Environment and Law of the Sea (3-1-3)**

The course is designed to introduce the basic concepts of meteorology, oceanography, Law of the Sea and their impact on naval operations and warfare. Students will be acquainted with meteorological phenomena, and different local weather conditions. In oceanography, ocean, ocean current, importance of the Arabian Gulf and monsoon seasons will be discussed. In Law of the Sea, students will deal with jurisdictional boundaries such as territorial waters, contiguous zones, high seas, exclusive economic zones specific to the UAE.

**NSE 2033 - Ship Structure and Damage Control II (3-1-3)**

The course aims at providing the students with the knowledge about the Ship Structure and DC on basic concepts of ship stability and also about material used onboard ship including its preservation. It also aims to provide the information regarding basic stability conditions. It also covers effects of various loading conditions and methods to calculate stability in case of damage to the ship structure. Finally, students will also be given practical demonstrations of various loading conditions and states of ship in Laboratory environments.

Prerequisite: NSE 1013

Corequisite: NSE 2043

**NSE 2043 - Ship Propulsion I (3-1-3)**

The course aims at providing the students with comprehensive knowledge of Marine Engineering Systems onboard warships with special emphasis on theoretical concepts and their application. In this course, students will learn administrative and functional organization of the Marine Engineering department onboard warships. It will also cover the working and components of conventional heat engines, propulsion and transmission systems, and combinations/configurations of engines and the transmission system.

Prerequisites: NSE 1003 and NSE 1013

Corequisite: NSE 2033

**NSE 2103 - Ship Propulsion II (3-1-3)**

This course aims at providing students with knowledge of the latest developments in propulsion systems, and of important auxiliary machinery/equipment fitted on warships. The course covers the latest developments in propulsion engine technology, such as water jet and electric propulsion systems, and descriptions of auxiliary machinery fitted onboard warships, such as refrigeration and air conditioning systems, the firemain system, desalination plants and steering systems.

Prerequisite: NSE 1013, NSE 2043

Corequisite: NSE 2033

**NWR 1103 - Naval Warfare and Operations I (3-1-3)**

The NWandO Course will familiarize the students with basic naval warfare concepts. It is an introduction to various naval platforms and will cover weapon/sensors outfits, surface warships, submarines, aircraft, weapons, and sensors, Above Water Warfare (AAW), and Underwater Warfare (UWW). The course also covers an introduction to AIO (Action Information Organization) with its peace and war time roles.

**NWR 2103 - Naval Warfare and Operations II (3-1-3)**

This course aims to acquaint Students with the basic concepts of various forms of naval warfare, including Anti-Air Warfare, Anti-Surface Warfare, Anti-Submarine Warfare, Mine Warfare, Electronic Warfare and Amphibious Warfare. Concepts are introduced in a practical manner by emphasizing the aim, purpose, platforms used, important terms and definitions and basic tactics involved. Military Operations Other Than War conducted by Naval Forces and principles of Naval Communication are also introduced.

Prerequisite: NWR 1103

**NWR 4003 - Surface and Sub-Surface Warfare (2-2-3)**

Students will be required to perform as an OOW to support surface and sub-surface operations. This includes operating with organic helo, conducting surface engagements and combined anti-submarine exercises. Students will need to analyze the tactical situation and respond appropriately to developing threats.

**NWR 4013 - Above Water Warfare (2-2-3)**

Students will be required to accurately and timely apply above water warfare procedures in a serialized program environment against air threats. Students will need to analyze the tactical situation and respond appropriately to threats and changes in emission control while remaining cognizant of the ship's disposition and formation.

**OPM 2103 - Operations Management (3-1-3)**

Provides a detailed study of value-added organizational activities, from procurement of resources and transformation into manufactured goods and service outputs. The course highlights the importance of operations management as a key function in most organizations, and discusses how effective management of operations is directly linked to organizational strategy. It also introduces strategic operations issues such as capacity planning, location planning, product/work design and development, and general quality policies.

Prerequisite: STS 2003

**PAD 2003 - Basics of Police Audit and Discipline (3-1-3)**

This course aims at educating the students about the importance of understanding the meaning and importance of discipline in the police service. This leads to the acceptance of strict orders and the performance of duties with a strong spirit and total obedience which generates confidence in the desire and conviction and the feeling that everyone is cooperating to carry out their duties.

**PAD 2013 - Audit Inspection and Investigation (3-1-3)**

This course aims to identify the means of supervision and inspection in the field of police work and in its path, which leads to the highest levels of efficiency, performance and outstanding performance based on the values of integrity, transparency and accountability, the best practice of work, the application of professional and legal standards and the promotion of the values of tender and belonging, thus enhancing credibility and confidence in performance.

**PAD 2103 - Operational Auditing (3-1-3)**

The curriculum contains Security operational auditing for police (in department work as well as in operations of police works) to identify the application Police procedures in dealing with various types of Security operational auditing spically when they deal with security threats they face during their performance.

**PCJ 2003 - Law and Procedure of Evidence (3-1-3)**

This course will cover the police and the prosecutors, the suspect or the accused, and the court system. The course will discuss main principles such as presumption of innocence, proper arrest, protection and gathering of evidence, accessibility of court, the criminal justice system, jurisdiction of criminal courts, private prosecution, search and seizure, arrest, indictments and charges, the conduct of criminal proceedings and the presentation of case.

**PCJ 2023 - Project Management for Law Enforcement (3-1-3)**

This course introduces the student to project management principles and their application to law enforcement projects. The course will discuss law enforcement case studies from Abu Dhabi Police and the associated project cycle including Initiation, Planning, Execution, and Closing. The course will also cover issues related to working with internal and external teams and agencies.

**PCJ 2033 - Criminal Investigations I (3-1-3)**

This course is designed in accordance with the UAE Code of Criminal Procedure so that this law which is the guide for the work and field procedures carried out by the criminal investigator and police staff when the crime occurs. This course shows the practical material procedures that must be taken at the time of the crime, Addressing the original powers of the judicial control officer to receive reports, complaints, investigation of crimes, hearing witnesses, inspection and crime scenes, using experts, and writing the report.

**PCJ 2043 - Community Policing (3-1-3)**

The course will integrate the theories and practices of contemporary community policing through analysis of various police case studies. Problem solving models and crime prevention strategies will be researched, developed and applied. Through practical exercises, students will analyze community issues related to crime and disorder, design and implement strategies to resolve the issues, and develop an analysis in order to evaluate success.

**PCJ 2053 - Special Criminal Legislation (3-1-3)**

This course includes the definition of the legal terms used in the context of the police law, explaining the articles related to duties, penalties and the rights of the members, as well as the definition of drugs, such as the methods of dealing with the causes of abuse, the ways of combating it.

**PHY 1103 - Physics I (3-1-3)**

An introductory level physics course that is essential for all Engineering programs. It covers many of the fundamental principles of physics such as units of measurement, linear motion, circular motion and angular motion, forces and Newton's laws of motion, work and energy, collisions and conservation laws, momentum. Laboratory work is required to reinforce and stress the importance of these principles using the experimental method for investigating and reporting results.

Prerequisites: PHY 0103.

**PHY 1203 - Physics II (3-1-3)**

A second course of introductory level physics course that is key for several engineering programmes. It covers many of the fundamental principles of physics such as electric charge and electrostatic fields, Coulomb's law and electric potential, electric current and magnetic fields, Ampere's law and Faraday's law of induction, optics, sound and mechanical waves. Laboratory work, utilising experimental methodology and written reports, is used to reinforce these principles.

Prerequisite: PHY 1103

**PLE 2013 - Management Punitive and Correctional Establishments (3-1-3)**

Designed in accordance with Abu Dhabi Police G.H.Q, students will identify all correctional institutions types and the administration systems in prisons. Also studying the law, organize the penalty implementation establishments, and its philosophy, organization, structure and competences. In addition the student would be able to deal with classification of convicts inside the prison and maintaining security and discipline.

**PLE 2053 - Introduction to Criminology (3-1-3)**

The subject of Criminology and Punishment includes the definition of the concept of Criminology, which investigates the crime as a general social phenomenon found with the existence of humanity, which is one of the most serious social problems facing the individual. This course attempts to identify the causes of this phenomenon and its motives and the most important theories that explained the criminal phenomenon and the most important factors both internal and external, which contribute to the crime.

**PLE 2103 - Management and Police Skills (3-1-3)**

The course covers the following topics: the nature of police administration, the procedures of police planning in the operations and administrative affairs, and the organization in the police system that corresponds to the changes taking place in the environment in which it operates and reach the goals set for the various plans. Thus, the practice of police administration is achieved in accordance with the scientific rules and rules that govern them and the implementation of duties and tasks assigned to the police Efficiently and effectively.

**PLE 2113 - Police Applications and System Practice (3-1-3)**

This course focuses on basic concepts in the use of computers and the identification of components, writing on the slots folders, in addition to the ability to use the keyboard and the recognition of writing tools, word processing, and handling data in the document format. Definition The definition of official writing in correspondence and used in the General Directorate of Abu Dhabi Police, their types and characteristics and the method of writing in official.

**PST 1003 - Criminal Law (3-1-3)**

This course covers the basic elements of information on the theory of criminal punishment. This involves the definition of criminal punishment and its nature, the type of punishment and its application and the role of the judiciary in such application. In addition, criminal treatments and other perceptual measures are also studied and this will be in comparison with punishment. The course according to UAE criminal law

**PST 1023 - Criminal Procedure (3-1-3)**

This course includes definition Law of Criminal Procedure, the public and the case, in terms of its edges the suspect and public prosecution, and their rights and obligations due to them, and the formation of the public prosecutor, and the relationship between its members, and its competence in the public interest litigation and outside legal rules relating to be set up, the competent authorities, and restrictions contained them, and ways to expiry.

**PST 1033 - Infantry Police and Practices (3-1-3)**

This course will enable the student to examine the history, nature, and scope of the Abu Dhabi Police (ADP) Infantry. Infantry Training Applications explains the importance of the infantry tactics practiced by the Abu Dhabi Police through an interdisciplinary approach that blends a liberal arts educational experience with criminal justice. Instruction will include lessons in discipline, team building, and leadership traits through class participation and infantry movements.

**PST 1043 - Skills and Responsibility (3-1-3)**

This course emphasizes the proficiencies and procedures applied through critical thinking techniques and hands-on development. Analytical, investigative and physical skills are developed the students' abilities. In addition to identifying the structure and duties of security organization, and define the conditional terms used in context, and to clarify all security procedures to prevent crimes, and identifying the duties of security patrols and security guards, which required skills of physical conditioning and defensive tactics to protect structures.

**PST 1103 - Weapons Science and Practice (3-1-3)**

This course will provide students with theory knowledge about weapons and the basic practice firearm techniques and firearms safety. The course is designed to prepare the policeman competency to handling the weapons and provide him by the laws and procedures regarding firearms using according in UAE law.

**PST 1123 - Official Correspondence and Computer Skills (3-1-3)**

This course will provide students introduction to information systems; Information systems in organizations, technical and managerial concepts necessary to run an e-policing systems, and regional topics may include: legal framework, security and trust, biometrics and ID system

**PST 1133 - Traffic Law (3-1-3)**

The course includes traffic definition and terminology traffic, classification of vehicles, traffic laws, traffic offenses and penalties, and the measures to be taken in these cases. Also, the course prepares the students to enforce the law of traffic and follow the appropriate procedure in dealing with roads users.

**PST 1153 - Maintaining Public Order (3-1-3)**

The course covers principle of project management and its application to law enforcement. Also, the course will cover patrol procedures to psychomotor skills on defensive tactics, firearms procedures, driving skills and officer-violator contacts.

**PST 2003 - Performance Appraisal (3-1-3)**

The course focuses on the definition of the police force and the determination of the message it aims to achieve in line with human rights and the exercise of its freedoms. The course also focuses on assessing police performance and mechanisms. And various evaluation criteria. also the students need to applied the electronic appraisal performance on system, working groups, analysis of educational films, classroom and out-of-classroom exercises, application of educational scenarios. Field visit to work sites.

**PST 2009 - Work Experience (0-9-9)**

The application methodology is to follow up the students in their work places by the lecturers according to a programmed plan. The follower lecturer is required to provide three reports, one of which is prepared by the student himself, under the guidance of the follower lecturer, in which the student shows his practical contributions in his field of work. Before the head of the direct student in the work assesses the performance of the student according to the criteria include elements studied in relation to what the student learned in his study.

**PST 2013 - Security Awareness (3-1-3)**

The curriculum contains a culture of security for police personnel (in dealing with the dangers) to identify the application Police procedures in dealing with various types of security threats they face during their performance, including the procedures of police departments to maintain their personnel, and the procedures of individuals on themselves during the threat to their lives and the lives of others.

**PST 2033 - Islamic Culture (3-1-3)**

This topic introduces the concept of education from its Islamic prospective, illustrates the importance and the need for religion, explains the main characteristics of the Islamic religion, discusses the sources of legislations especially the Quran and Sunna, explains the six pillars of Iman and the concepts related to them.

**QMT 2003 - Total Quality Management (3-1-3)**

Covers the principles, concepts and philosophies related to total quality management. Examines why quality management is fundamental to strategic management and its importance to organizational excellence. Identifies and analyzes how quality concepts such as leadership and partnership can lead to organizational excellence, superior value, and global competitiveness.

**QMT 2103 -Quality Standards and Excellence Models (3-1-3)**

Provides fundamental tools, models and strategies for continuous and breakthrough improvement in organizations through understanding and applying current practices in quality standards and business excellence models. Examines ISO standards and Quality Management systems in part one and international and local excellence models in part two. Provides an organizational view of performance excellence, as reflected in the ISO standards, Malcolm Baldrige criteria, EFQM framework, complemented by UAE-based models.

Prerequisite: QMT 2003

**QMT 3003 - Quality Management Tools (3-1-3)**

Provides students with skills in the application of tools and methods related to quality improvement and management methods implemented in organizations for excellence and quality. Focuses on skills to create cause and effect diagrams, Pareto charts, statistical process control, CEDAC, and six sigma. Addresses employee involvement and management commitment towards using quality tools and quality improvement methods in a continuous manner.

Prerequisite: QMT 2103

**QMT 3013 - Business Process Management (3-1-3)**

Develops an in-depth understanding of business processes and examines the workflow, equipment needs, and implementation requirements for a particular process. The course examines the roles and responsibilities in strategic realignment, as well as the tools, methods, techniques and templates to map, plan and implement processes. The relationship with information systems, workflows and automation strategies are examined to achieve success with the process design.

Prerequisite: OPM 2103

**QMT 4003 - Service Quality Managements (3-1-3)**

Provides an integrated approach to service quality management addressing the factors of development of long term customer relationships as a pathway to achieving excellence and quality. Guides learners through service design, delivery and recovery to evaluate different service models such as Service Gaps, Service Quality (SERVQUAL) and Customer Relationship Management (CRM) to implement strategies that support business processes and development.

Prerequisite: QMT 2003

**QMT 4013 - Advanced Strategic Management (3-1-3)**

Builds on the foundation formed through topics from BSN 3503 and aims to enhance the strategic management competencies of the students. Addresses conceptual frameworks such as VRIO to diagnose and manage strategic capabilities and key drivers of competitive advantage. Evaluates business and corporate strategy based upon the firm's unique proposition of value, profit and people and discusses organizational structures as levers of implementation of the strategy.

**QMT 4033 - Statistical Quality Control I (3-1-3)**

Provides in-depth analysis of statistical models applied in DMAIC (Define, Measure, Analyze, Improve, Control) problems, including statistical models to analyze and make inferences for quality control and improvement applying probability distributions, probability plots and point estimations for uni and multi-variate samples.

Prerequisite: STS 3113

**QMT 4053 - Lean Management (3-1-3)**

Provides fundamental knowledge about Lean principles, concepts, tools and methods to achieve sustainable improvement in the organization, covering diagnostics tools, Lean transformation practices, and the human and technical aspects of the Lean transformation. Enables learners to demonstrate the skills, competencies and mindset of a Lean Thinker from through the use of case studies and individual or/and group exercises simulating real world business applications.

Prerequisite: QMT 2003

**QMT 4103 - Project Management (3-1-3)**

Provides the essential knowledge of project management principles, methods, tools and techniques used in projects, including key terminology, context and processes. Enables the students to demonstrate skills in project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management, project procurement management and project stakeholder management.

Prerequisite: OPM 2103

**QMT 4113 - Experimental Design (3-1-3)**

Provides in-depth analysis of the techniques to plan and design experiments to check and validate empirical models for process development and improvement, presenting the results of statistically designed experiments and develop models that are effective for continuous quality management in an organization.

Prerequisite: QMT 4033

**QMT 4123 -Six Sigma (3-1-3)**

This course provides knowledge and practical skills of six-sigma concepts through the application of related tools and techniques. The student will be able to plan, communicate and manage six sigma processes in an organization after the completion of the course. Introductory topics on Green belt and Black belt will prepare students for industry certifications, complement their ability to analyze critical operations and evaluate process capabilities of organizations.

Prerequisite: QMT 3003

**QMT 4133 -Statistical Quality Control II (3-1-3)**

Provides and in-depth study of effective statistical process monitoring and control using time-weighted and other advanced control chart techniques, as well as the application of multivariate process monitoring, adjustment and control tools. Learners improve skills in process design and improvement with designed experiments that lead to process optimization, and acceptance sampling.

Prerequisite: QMT 4033

**QMT 4143 -Value Stream Management (3-1-3)**

Provides in-depth knowledge about lean concepts and application of tools and techniques related to value stream mapping. Examines the identification of value streams, planning, and application of lean management concepts at three stages of lean (i.e. demand, flow and levelling).Using critical evaluation students will be able to identify value stream processes which are most beneficial to the business, apply and map lean metrics into a future state of efficiency and provide recommendations for value streaming and sustainable processes.

Prerequisite: QMT 2003 and QMT 4053

**QMT 4153 - Quality Auditing (3-1-3)**

Provides the basics of quality auditing, covering models, techniques and methodologies necessary to understand, plan, deploy, and evaluate quality audit processes as part of a quality management system. Focuses on professional standards, technical skills and core competencies of the quality auditor, applicable to the preparation, performance, reporting, follow-up and closure of the quality audit process.

Prerequisite: QMT 3003

**QMT 4203 - Quality Research Project (3-1-3)**

Provides students with the resources to apply the research skills from previous courses as a framework for a final industry-based research project for the Quality Management major. The final semester industry research project encourages students to identify and address learning outcomes across major. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment.

**SLM 2003 - Supply Chain Management (3-1-3)**

Focuses on the design, planning, control, and improvement of supply chains for competing effectively in the context of global operations. Topics include supply chain structure and configuration, approaches to intra-organizational and inter-firm integration, and complexities of material, information, and cash flows cross international borders.

**SLM 3003 - Supplier Management (3-1-3)**

Investigates the concepts and main activities in procurement and supply management. Examines the fundamental logic and commonly used practices in making procurement and supply decisions. Studies the procurement and supply function from a management perspective and the general principles in choosing sound purchasing and supply strategies.

Prerequisite: SLM 2003

**SLM 3013 - Warehouse and Distribution Management (3-1-3)**

Focuses on the effective management of warehousing and distribution, which are vital to the fulfillment of customer demand and the ultimate success of a supply chain. Covers the key elements of distribution and warehousing infrastructure, with a view to ensuring optimal logistical performance.

Prerequisite: SLM 2003

**SLM 3113 - Logistics Management (3-1-3)**

Covers concepts and main activities in logistics systems and supply chains. Examines the fundamental logic and quantitative methods in making logistics decisions. Focuses on the location planning problems and the demand forecasting in logistic management. Topics examined include, logistics and supply chain decisions from a management perspective, the qualitative nature of logistics systems, and the general principles in developing sound supply chain strategies.

Prerequisite: SLM 2003

**SLM 4003 - Supply Chain Risk Management (3-1-3)**

Focuses on the identification, assessment and mitigation of, and response to, supply chain risks. It covers strategic and tactical approaches for mitigating various failure points within the supply chain, and quantifying financial, operational hedging, outsourcing, and new product development risks.

Prerequisites: SLM 3003 and SLM 3113

**SLM 4013 - Supply Chain Operations Planning and Control (3-1-3)**

Examines important concepts and issues involved in managing the supply chain operations of a business enterprise. It covers important concepts, issues, and methods of an operations planning and control system such as the transformation process, material planning framework, sales and operations planning, resource plan, master scheduling, material planning, detailed capacity planning, production activity control, and strategic implementation of MPC systems.

Prerequisite: OPM 2103

**SLM 4033 - Procurement and Inventory Management (3-1-3)**

Students learn about different inventory management decisions that affect a firm's buying practices. Best practices in inventory management and sourcing and supply management within a domestic and global supply chain context are also reviewed. Students learn about good practices that buying professionals can use to be able to perform their buying tasks more effectively. These practices include selecting the right suppliers, negotiations skills, conducting price and cost analyses, and using information systems to make buying decisions.

Prerequisite: SLM 3003

**SLM 4103 - Sourcing in Procurement (3-1-3)**

Examines appropriate tools and techniques that can be used to enable organization to assess sourcing options when procuring goods, services or work from external suppliers. Best practices in sourcing and procurement within a domestic and global supply chain context will be reviewed. Student will be able to develop coherent understanding of important concepts such as strategic sourcing in relation to procurement, supplier evaluation and selection, developing a plan for sourcing, and the main processes in sourcing requirements.

Prerequisite: SLM 4003

**SLM 4113 - Negotiating and Contracting in Procurement (3-1-3)**

Investigates the basic concepts and main activities in negotiating and contracting from a procurement and supply chain management perspective. Deals with the different aspects and approaches to negotiations and look in detail at the negotiations process. Also looks at tendering as procurement tool. Examines the legal aspects of purchasing, including contract management from a procurement perspective.

Prerequisite: SLM 4003 and LAW 3103

**SLM 4123 - Managing Relationships in Procurement (3-1-3)**

Discusses, analyses and applies business relationship management concepts from the perspective of the procurement manager. This includes contract management, assessing the relationship management approach, evaluating supplier performance, and the creation of initiatives to improve buyer/supplier capabilities and performance.

Prerequisite: SLM 3003

**SLM 4203 - Logistics and Supply Chain Final Project (3-1-3)**

Uses research skills from previous courses as a framework for a final semester industry-based research project for the Logistics and Supply Chain major. The final research project encourages students to identify and address learning outcomes across the major. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment.

**STS 2003 - Business Statistics (3-1-3)**

Develops the ability to assess and critically interpret statistics and business information and apply them in changing business environments. Develops a clear theoretical understanding of various analytical tools, including descriptive statistics; probability; confidence intervals, and hypothesis testing; and an appreciation of the application of analytical tools to business decision contexts. These skills and competencies provide a foundation for professional practice and further study in the major's degree.

Prerequisite: LSM 1003

**STS 3113 - Advanced Statistical Models (3-1-3)**

Develops student's ability to assess and critically interpret statistics and business information and apply them in changing business environments. Develops a clear theoretical understanding of advanced analytical tools including advanced hypothesis testing, ANOVA, correlation, regression and time series analysis, applications of advanced non-parametric models, and statistical process control.

Prerequisite: STS 2003

**TRM 2003 - Introduction to Tourism (3-1-3)**

Introduces concepts, issues, and theories of tourism and hospitality as an economic sector and topic of academic study. Covers a broad range of topics related to the travel experience, from business development to the linkages between tourism as an industry and the impacts it has on communities and places. In addition it introduces the key elements of the tourism industry and opportunities for employment within this industry.

**TRM 2103 - Consumer Behaviour in Tourism (3-1-3)**

Explores the importance of consumer behaviour in tourism, the typologies of tourist behaviour, market segmentation and the global pattern of tourism demand. It focuses on topical issues in tourist motivation, emergence of new segments and changing tourist demands. This course also provides students with the knowledge needed to investigate ways of optimizing the effectiveness of tourism marketing activities through understanding how consumers make their decisions to purchase or use tourism products.

Prerequisites: TRM 2003 and MRK 1103

**TRM 3003 - Tourism Operations and Analytics (3-1-3)**

Integrates the functional areas of operations in tourism, travel and hospitality organisations. Examines process planning, business analytics, delivery and control systems for the production of goods and services in the tourism, travel and hospitality industries. Provides a review of airport operations, processes of service quality and customer satisfaction that enables competitive advantages for the organization.

Prerequisite: TRM 2003 and OPM 2103

**TRM 3013 - Integrated Technologies for Tourism (3-1-3)**

Actively explores the relationship between integrated communication technologies in tourism from both a consumer and organizational perspective. Analyses technology applications in tourism, travel and hospitality. Critically evaluates current and innovative emerging developments in integrated technologies to support the overall strategic objectives of an organisation.

Prerequisite: TRM 2003

**TRM 3103 - Sustainable Tourism (3-1-3)**

Examines the principles of sustainable tourism with reference to environmental, economic, and socio-cultural aspects of tourism development. Provides an understanding of current industry practices in sustainable tourism. Offers a practical component, allowing students to develop a sustainable tourism visioning plan, taking into account the views of major stakeholders.

Prerequisite: TRM 2103

**TRM 3113 - Tourism Human Resource Management (3-1-3)**

Focuses on understanding human resource management theories in the tourism industry such as human resource planning, recruitment process, introducing performance management and embracing diversity management. Addresses workplace changes and challenges for HRM in tourism organizations. Addresses workplace changes and challenges for HRM in tourism organizations.

Prerequisite: TRM 2103

**TRM 4003 - Economics of Tourism (3-1-3)**

Explores how micro and macroeconomics impact tourist decisions of when, where and how to travel, this course provides an understanding of economic geography and the economics of tourism. Provides the required knowledge and skills to analyse trends and flows of tourism and its economic effects with specific emphasis on how individual travel decisions impact global economies. In addition provides the skills required to interpret demographic analytics and statistical data, in order to evaluate the economic impact of tourism.

Prerequisites: TRM 2003 and ECO 1103

**TRM 4023 - Tourism Marketing (3-1-3)**

An applied approach to the strategic function of marketing in the context of tourism. Designed to offer a comprehensive coverage of tourism marketing strategies. Incorporates social media strategies and online marketing. Provides students with the skills and knowledge to effectively execute research, targeting and positioning as well as evaluating tourism marketing.

Prerequisite: TRM 2003 and MRK 1103

**TRM 4033 - Special Interest Tourism (3-1-3)**

Investigates the unique and rapidly developing field of special interest tourism (SIT). Examines specialist tourism activities and provides an overview of each aspect that SIT contributes to industry development. Designed to provide the knowledge and skills to plan, manage and promote a business venture, which includes targeted marketing a range of special interest activities by acquiring, interpreting and applying topical theory and practice.

Prerequisite: TRM 3003

**TRM 4103 - Strategic Management in Tourism (3-1-3)**

This course explores strategic management and planning in a tourism context. Using both a theoretical and practical approach, students will examine the concepts of strategic planning and competitive strategy and how they can be successfully applied by organizations in an increasingly complex and global tourism environment.

Prerequisite: TRM 3003 and MGT 3103

**TRM 4113 - Heritage and Cultural Tourism (3-1-3)**

Covers advanced concepts and techniques for preserving tourism destinations, based on heritage, history and salient cultural characteristics. The course additionally looks at topical issues in cultural tourism marketing, and discusses analytical frameworks for assessing the viability of new tourism markets based on cultural and historical/heritage imperatives.

Prerequisite: TRM 3103

**TRM 4123 - Visitor Attraction Management (3-1-3)**

Addresses core issues related to the management of attractions in tourism operations. Covers the strategic and operational aspects of attractions. Examines the attractions life-cycle processes, as well as financial, risk management and people-management issues that may modulate the performance of attractions.

Prerequisites: TRM 3003 and TRM 3113

**TRM 4133 - Event Management for Tourism (3-1-3)**

Examines theoretical and applied aspects of tourism event management. Presents structured frameworks for planning, initiating and managing destination-based tourism events projects. Looks additionally at key factors and processes involved in the strategic marketing for tourism events. Financial control, risk management, legal and logistical aspects of tourism events are also discussed. Prerequisites: TRM 2003 and TRM 3003

**TRM 4203 - Tourism Final Project (3-1-3)**

Demonstrating mastery of the program learning outcomes, this capstone final semester course requires the application of in-depth knowledge and research skills gained across the Tourism Management Program to be evidenced in the industry-based project and report. The purpose is to integrate previously taught stand-alone courses in order to identify opportunities for the application and critical review of theory and practice in a business environment. In addition, this project is to be informed and supported where possible by industry in order to provide a high level of authentic learning.

**UAV 4003 - UAV Pilot Ground School (4-1-3)**

Ground school training is designed to prepare the student to operate the training aircraft for flight and includes technical and operating details of training aircraft systems and flight line and safety procedures.

Prerequisites: AVS 2133, AVS 3113 and AVS 4012

**UAV 4012 - UAV Pilot General Handling Ground School (3-1-2)**

Students are taught the specific details of airfield operating procedures, aircraft flight procedures and aircraft manoeuvre procedures for VFR conditions. All aspects of general handling are covered including take-off, landing, climbing, descending, turning, level flight, circuits, emergency recovery, and aerobatics.

Prerequisite: UAV 4003

**UAV 4022 - UAV Pilot General Handling Flying (3-1-2)**

Students practice general handling flight, applying all information and skills provided by previous courses. Students carry out airfield operating procedures, aircraft flight procedures and aircraft manoeuvre procedures for VFR conditions. Basic flight profiles for general handling are covered including take-off, landing, climbing, descending, turning, level flight and circuits.

Prerequisite: UAV 4012

**UAV 4031 - UAV Pilot Instrument Flying (2-1-1)**

Students practice flight using only instruments for attitude and location reference. Students adhere to Instrument Flight Rules and follow instrument flight procedures for flight and navigation. Students will fly standard departures and arrivals and will navigation to IFR and local operating procedures using radio navigation aids.

Prerequisite: UAV 4003

**UAV 4041 - UAV Pilot Navigation Flying (2-1-1)**

Students apply navigational procedures and techniques to fly an aircraft in accordance with a navigational plan, using navigation maps, charts and navigation radio aids. Students practice visual navigation and radio aid navigation.

Prerequisite: UAV 4003

**UAV 4103 - Unmanned Aircraft Operations (4-1-3)**

This course will prepare the student to be able to select a UAV system to achieve a specific military output and to determine how to configure and use that UAV to achieve the mission goals. The considerations and constraints on UAV operation due to civil and military airspace control are discussed.

Prerequisite: UAV 4022

**UAV 4113 - Unmanned Vehicle Systems (4-1-3)**

Students will study the wide range of systems commonly found on UAVs, including propulsion, payload, automation and remote control, communications and sensing systems.

Prerequisite: UAV 4022

**UAV 4203 - UAV Ground School (4-1-3)**

Ground school training is designed to prepare the student to operate the training aircraft for flight and includes technical and operating details of training aircraft systems and flight line and safety procedures

Prerequisite: UAV 4022

**UAV 4213 - Flight Simulation Training (4-1-3)**

Students apply flight path control and navigation skills obtained in manned flight courses to remote control fly a simulator training UAV to achieve a military mission profile. The students will prepare the UAV for flight, carrying out safety inspections, and will practice emergency handling procedures.

Prerequisite: UAV 4203

**UAV 4223 - Flight Training (4-1-3)**

Students apply flight path control and navigation skills obtained in manned flight courses to remote control fly a live training UAV to achieve a military mission profile. The students will prepare the UAV for flight, carrying out safety inspections, and will practice emergency handling procedures.

Prerequisite: UAV 4203

**VET 1103 - Veterinary Anatomy and Physiology I (3-2-3)**

This course provides an introduction to basic anatomy and physiological principles from cellular level to the whole organism. The focus will be on establishing a basic understanding and appreciation of the interrelationship between the different topics covered. These topics will include an Introduction to Anatomy and Physiology; the Chemical Basis of Life; Cellular Structure and Processes; Tissues; The Integumentary System; Skeletal System; Muscular System; Cardiovascular System and Blood, Lymph and Immunity. A laboratory component will allow students to explore physiological concepts through a range of laboratory based activities.

**VET 1123 - General Chemistry (3-1-3)**

Develops an understanding and necessary skills to apply the fundamental concepts of chemistry to Veterinary Scientists. The following topics are covered: matter and measurements in chemistry, atomic theory and periodic table, naming and formulas of inorganic compounds, concepts of chemical bonding, mass relations in chemical compounds and reactions. Classroom concepts are supported by laboratory experiments.

**VET 1203 - Veterinary Anatomy and Physiology II (3-2-3)**

The second semester of Anatomy and Physiology will encompass the respiratory system structure and processes, the digestive system, accessory digestive organs, the reproductive systems, the urinary system, the nervous system, the sensory organs and the endocrine system. Differences in animal anatomy is also covered. This course covers histology.  
Prerequisite: VET 1103

**VET 1223 - Animal Science and Husbandry (3-1-3)**

Upon successful completion of this course students will have the knowledge and understanding of zoological classification of animals, different breeds of animals, approaching, handling and restraining of animal. General management practices, identification (ear tagging, tattoo) and age determination of different animal species (dentations).

**VET 1313 - Physics for VET Sciences (3-1-3)**

This course is an introductory level physics course. It covers many of the fundamental principles of physics such as units of measurement, energy, mechanics, fluids, heat, sound, and light. Laboratory work is required to reinforce and stress the importance of these principles using the experimental method for investigating and reporting results.

**VET 1403 - Veterinary Terminology (3-1-3)**

Covers basic medical terminology beginning with prefixes, suffixes and word roots used in the animal care and veterinary language. Students build on this knowledge by identifying, analyzing, defining, spelling and pronouncing terms and learning abbreviations related to each of the animal systems, as well as basic introductory principles of drug administration routes and drug classifications.

**VET 1413 - Inorganic Chemistry (3-1-3)**

Introduces the fundamental concepts of Inorganic Chemistry, to include chemistry laboratory safety, basic knowledge on the analysis of subatomic and atomic properties based on the periodic table of elements; integration of concepts of higher order of organization of elements to molecules; acid base reactions; oxidation reduction reactions, thermodynamics, kinetics, gravimetric, volumetric analysis and practical aspects of chemical reactions and quantities.

**VET 1904 - Veterinary Practicum I (1-15-4)**

Provides workplace experience in a real working environment both in veterinary laboratories and clinic. It should give students the opportunity to develop professional and work skills, ethics, habits, and practices as observed in real work situations. Combining knowledge obtained at the college to the practice they will do in workplace will improve students' professional skills. This course will enable students to apply and practice skills, knowledge, and techniques gained during their first year in the veterinary programme in real work placement

**VET 2003 - Veterinary Pathology (3-1-3)**

Provides students with an understanding of principles of disease related to pathological processes (mechanisms of cell injury, inflammation and healing, degeneration, necrosis, and neoplasia, vascular disturbance) and their causes (physical, chemical, infectious and genetic). Students will be introduced with concepts of general features of the immune system, innate and adaptive immunity, and disorders of the immune system.

**VET 2123 - Animal Nutrition and Feeding (3-1-3)**

Covers the basic concepts and principals of animal nutrition including digestion in various types of digestive systems. The course will cover the nutritional requirements (water, carbohydrate, proteins, lipids, vitamins, minerals and trace elements) for livestock and companion animals during their various stages of life.

**VET 2133 - Systemic Pathology (3-1-3)**

Systemic pathology covers diseases as they occur in each organ system. Systems covered in Systemic Pathology include the cutaneous, musculoskeletal, cardiovascular, respiratory, and digestive system; Hematopoietic, urinary and genital; the nervous system and endocrine. Lectures are supplemented by practical classes.

Prerequisites: VET 2103 and VET 2003

**VET 2213 - Organic Chemistry (3-1-3)**

Covers the basic and fundamental principles of organic chemistry, nomenclature, structure and properties of organic molecules, reactions and mechanisms. In the practical component, the student will identify compounds based on their functional groups and apply the knowledge and principles learnt in the theory sessions

**VET 2323 - Biochemistry (3-1-3)**

Focuses on the chemical properties of the living systems, and the study of the molecular basis of life to include their roles in all biological processes. The main topics include structures, properties and functions of amino acids, proteins, carbohydrates, enzymes, lipids and nucleic acids. These topics are supported by hands on practical sessions to demonstrate some of the functions and utilities of biochemical compounds and processes.

**VET 2423 - Veterinary Microbiology (3-1-3)**

Provides students with theoretical and laboratory techniques in the classification, isolation and identification of microorganisms. The course comprises study of the diverse mechanisms bacteria use to cause disease, pathogenicity, body defense mechanisms. A range of important bacteria in livestock and domestic animals will be discussed, with emphasis of their ecology, and pathobiology of the disease. Students acquire an understanding of the mechanisms of the antibacterial action and resistance to antimicrobial agents.

**VET 2904 - Veterinary Practicum II (1-15-4)**

Provides workplace experience in a real working environment both in veterinary laboratories and clinic. It should give students the opportunity to develop professional and work skills, ethics, habits, and practices as observed in real work situations. Combining knowledge obtained at the college to the practice they will do in workplace will improve students' professional skills. This course will enable students to apply and practice skills, knowledge, and techniques gained during their second year in the veterinary programme in real work placement

**VET 3003 - Veterinary Parasitology (3-1-3)**

Students will be familiarized with the essential facts and concepts of veterinary parasitology (Protozoology, Helminthology and Entomology). Emphasis is placed on diagnosis, pathogenesis and management of parasitic infections. The biology of parasites of major veterinary importance will be stressed to impart the understanding necessary for control of parasitism.

Prerequisite: VET 2423

**VET 3033 - Principles of Genetics and Animal Reproduction (3-1-3)**

Provides students with a basic understanding of the principles, and concepts of animal genetics, and breeding. This course will cover the physiological basis for reproduction in animals. Topics covered will include comparative functional anatomy and physiology of male and female reproductive systems, development of the gametes, pregnancy and parturition, the various breeding techniques including artificial insemination and embryo transfer and application of genetic engineering in animal reproduction.

**VET 3103 - Meat Inspection and Food Safety (3-1-3)**

Covers the pre-slaughter examination of animals and humane slaughter practices. Lectures outline and explore the pre-slaughter care, slaughtering and preparation operations, ante- and post-mortem examinations, affections, pathological, microbial, parasitic diseases and their decisions, meat spoilage, its causes and prevention, meat preservation, meat microbiology and residues. The principles of food hygiene and safety will be discussed.

Prerequisites: VET 1103, VET 1203, VET 2323, VET 2133 and VET 2423

**VET 3113 - Animal and Disease Prevention I (3-1-3)**

Provides students with the fundamentals understanding of animal health and agents that lead to disease, including the general aspects of disease within different body systems. It covers the theoretical and practical skills required to perform general clinical examination, including the visual examination, the normal physiologic values for the different animal species and the clinical examination by body systems and region. Additionally, the basics principles of disease prevention in animals will be discussed.

Prerequisites: VET 2133, VET 2423 and VET 2003

**VET 3143 - Veterinary Professional Practice (3-1-3)**

Provides students with a variety of clinical and nursing skills. Students will be able to perform patient assessment through physical examination and collection of diagnostic specimens including blood, urine, and feces. Therapeutics will also be covered including administration of medications (analgesia, and sedation in animals), bandaging, and wound management. This course will also cover emergency and critical care in herds applicable to a broad range of species.

Prerequisites: VET 2423, VET 3003, VET 3033 and VET 3423

**VET 3423 - Clinical Pathology and Diagnostic Laboratory Tests (2-2-3)**

Further the skills of students in laboratory tests of various samples (blood in addition to urine, body fluids, and tissue samples) that are commonly used in veterinary clinical pathology. The value of these tests as a diagnostic tool of animal diseases (disorders) will be demonstrated. Understanding and interpretation of results obtained from each test will be emphasised and correlated to clinical cases. Hands-on laboratory experiences will emphasise the common clinical pathological tests and how tests are performed.

Prerequisite: VET 2423

**VET 3904 - Veterinary Practicum III (1-15-4)**

Provides workplace experience in a real working environment both in veterinary laboratories and clinic. It gives students the opportunity to develop professional, work skills, ethics, habits, and practices as observed in real work situations. Combining knowledge obtained at the college to the practice they will do in workplace will improve students' professional skills. This course will enable students to apply and practice skills, knowledge, and techniques gained during their second year in the veterinary programme in real work placement.

**VET 4003 - Pharmacology and Toxicology for Veterinary Science (3-1-3)**

Provides students with an understanding of pharmacology and pharmaceuticals applicable in the veterinary field. Content includes the application of pharmacology, classifications of drugs and their usage, mechanism of action, side effects, and dosing. Preparation and administration of medications, interpreting prescriptions. Veterinary management and practice dispensing medication are also addressed.

Prerequisites: VET 3423, VET 1103 and VET 1203

**VET 4033 - Animal Disease and Prevention II (3-1-3)**

Completes the Animal Disease and Prevention I course, focus on basic and clinical aspects of the disease, disease transmission, clinical signs and diagnosis of diseases in different groups of animals, birds, poultry and wildlife. The methods used in the control and prevention of disease will be discussed including the importance of vaccination and the types of vaccines available in disease prevention and control.

Prerequisite: VET 3113

**VET 4113 - Infectious Diseases and Animal Quarantine (3-1-3)**

Provides the essential information on the major infectious diseases of different animal species caused by viral, bacterial, fungal and parasitic infections as well as arthropod vector biology and vector-borne diseases. It covers the zoonoses, the pathogenesis, clinical signs, the host-pathogen interactions, mode of disease transmission and means of prevention and control. Various strategies of detecting and confirming and managing disease outbreaks will be discussed as well as the principles of animal quarantine and biosecurity.

Prerequisites: VET 2423 and VET 3003

**VET 4123 - Veterinary Epidemiology and Public Health (3-1-3)**

Introduces students to the basic concepts of veterinary epidemiology. The concept of disease occurrence as a complex interaction between host, agent and environmental factors, present descriptive epidemiology exercises on the strengths and weaknesses of different epidemiological study designs. The quality of evidence of causal relationships provided by different epidemiological study designs will be compared and discussed.

Prerequisites: VET 4113 and VET 4033

**VET 4133 - Wildlife and Aquaculture (3-1-3)**

Provides students with the opportunity to learn and apply the principles of wildlife and aquaculture husbandry, handling, welfare, health care and management. In addition, it will provide students with the opportunity to learn and apply the principles of wildlife and aquaculture disease ecology, conservation medicine and ecohealth and conservation practice.

**VET 4223 - Veterinary Legislations and Animal Welfare (3-1-3)**

Provides students with the principles and applications of animal welfare, legislation and ethics concepts in a wide range of situations with farm animal practice, transport and slaughter, companion animals, laboratory animals, animals used in competition and wildlife or for scientific research.

**VET 4904 - Veterinary Practicum IV (1-15-4)**

Provides workplace experience in a real working environment both in veterinary laboratories and clinic. It gives students the opportunity to develop professional, work skills, ethics, habits, and practices as observed in real work situations. Combining knowledge obtained at the college to the practice they will do in workplace will improve students' professional skills. This course will enable students to apply and practice skills, knowledge, and techniques gained during their second year in the veterinary programme in real work placement.

**VET 4906 - Veterinary Capstone Project (8-7-6)**

Provides an opportunity for the Vet students to study a specific area from the four major areas in the Vet program. Students are expected to utilize knowledge learned in the four years of the program and Practicum experiences to select an area of interest to investigate, choose appropriate methodology, collect and analyze data and present conclusions in a final capstone presentation.

\* To ensure continued compliance with GCAA regulations, the numerical breakdown (in parentheses) for the aviation courses (AVT courses) reflects the following information: Lecture Hours – Additional GCAA required Contact Hours (Practical Hours + Tutorial Hours) – Credits