



ENGINEERING DEPARTMENT
COURSE DESCRIPTION
ELECTRICAL ENGINEERING PROGRAM (DIPLOMA SECOND YEAR LEVEL)

Course Code	Course Title and Description	Credit Hours	Contact Theory Hours	Contact Hours Practical
MATH 2100N	Calculus II: This course enables the students to learn the various integration methods like, integration by parts, by long division, by using partial fractions, by trigonometric substitution, by reduction formula etc. Numerical integration. Definite integration and its properties. Applications of definite integrals to find areas and volumes. Concepts of even and odd functions. Concept of zeros of a function. Area between two curves. Lengths of plane curves. The functions of several variables. Partial derivatives of order one and two. Graphs of some well known functions. Multiple integrals: Double integrals. Change of order of integration.	3	3	-
EEPW 2150	Electrical Principles: This course provides the students with an understanding of basic electrical principles and concepts, leading to the ability to carry out calculations involving DC circuits, inductive & capacitive circuits, DC network theorems, electromagnets and AC fundamentals. This course also covers the laboratory experiments based on the outcomes mentioned above.	3	2	2
ENGL 2100	Technical Communication: This course is designed to provide the learner with writing skills for academic and practical purposes. Speaking skills relevant to presentation delivery are also targeted. Other skills namely reading and listening will be improved as a result from the focus on writing skill.	3	2	2
EETE 2102	Electronics I: This course is designed to build a strong foundation for the students on basic electronics. It deals mainly with the basic semiconductor devices like diodes, BJT FET, MOSFET and their characteristics. This course also deals with the basic amplifiers and circuits. This course also covers the laboratory experiments based on the outcomes mentioned above.	3	2	2
EERE 2201	Introduction to Renewable Energy: This course develops the ability To understand the importance of renewable energy resources and its utilization for the thermal and electrical energy needs and also the environmental aspects of these resources. Understand the various forms of conventional energy resources. Learn the present energy scenario and the need for energy conservation. Explain the concept of various forms of renewable energy. Outline division aspects and utilization of renewable energy sources for both domestics and industrial application. Analyze the environmental aspects of renewable energy resources. This course also covers the laboratory experiments based on the outcomes mentioned above.	3	2	2
PHIL 3108	Business Ethics: This course is to equip the student with the highest ethical standards that will guide him/her through real life dilemmas. It also enables the student to understand the concept of value, Islamic and Omani values, appreciate and respect ethnic and cultural diversity.	3	2	2
EEPW 2251	Electrical Power Technology: This course has been introduced for providing the students with understanding of the working and operation of Three phase power supply systems and loads, Transformer, DC & AC Generators and Motors which are employed in the industries and commercial/domestic buildings. This course includes both theory and	3	2	2



	practical aspects with more emphasis on practical experiments. This course also covers the laboratory experiments based on the outcomes mentioned above.			
EETE 2270	Fundamentals of Digital Electronics: This course enables the students to understand fundamentals of digital electronics. It provides the students the knowledge designing and implementing different types of logic circuits-Both combinational logic & sequential logic. This course also covers the laboratory experiments based on the outcomes mentioned above.	3	2	2
EEPW 2241	Electrical Skills: This subject allows the student to have practical experience on the functioning of electrical circuits and various equipments. They will have the complete knowledge of electrical installation design of a building which will help them in future. They will be able to handle the electrical equipments (ELCB, MCB, Fan motor, Tube light circuit, Pump Motor control etc.) that they come across in day to day life. This course also covers the laboratory experiments based on the outcomes mentioned above.	3	-	6
EEPW 2252	Electrical Power Systems: This course is designed to enable the students to understand the generation, transmission and distribution of Electrical power associated with mathematical modeling for power systems. This course also covers the laboratory experiments based on the outcomes mentioned above.	3	2	2
EEPW 2399	Diploma Project: To expose each student to the situation where he/she works individually or on a team in a project in the field of engineering. The course will enable the student to integrate the various areas of knowledge he/she gained through the program and to consolidate personal confidence in working independently or as a team and improve his/her spirit of performance.	3	-	6
EEPW 2320	Instrumentation & Measurement Techniques: This course enables the students get exposure to sensors of different forms for automation. Measurement methodologies.	3	1	4



ENGINEERING DEPARTMENT
COURSE DESCRIPTION
ELECTRICAL ENGINEERING PROGRAM (ADVANCED DIPLOMA LEVEL)

Course Code	Course Title and Description	Contact Hours	Credit Hours
MATH 3120N	Engineering Mathematics: This course introduces the students to differential equations. This enable the students to learn how the physical problems are represented by means of differential equations, to recognize their types, various methods of solving them, various types of solutions and distinction between them, and to recognize the governing differential equations frequently arise in engineering situations. Laplace transformations, their uses to find solutions of initial value problems and boundary value problems. Partial differential equations and their applications in engineering.	3	3
EETE 3102N	Electronics II: The course Electronics helps the student to understand the concepts of Fully understand the basic concepts and operation of electronic circuits and small signal amplifiers using MOSFET, Discuss and analyze the operation of class A, class B, class AB and class C power amplifiers, To describe the operation & design of an operational amplifier, differential amplifier & Integrated circuit amplifiers, Analyze several linear and nonlinear applications of operational amplifiers, To be able to design, setup, and test tuned amplifiers, sinusoidal oscillators & waveform generators, Describe the requirements for the technique used to achieve high frequency response and feedback stability of different amplifiers & be able to solve some mathematical problems. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
PHIL 3201	Formal Arabic Communication: This course is to strength the relationships between the students and his Arabic language and to sure its academic and practical role in society. Also to gain the basic skills in oral and written communication.	4	3
EEPW 3150	Power Distribution Systems: This course enable the student to understand the concepts of Design radial and loop types of primary feeders, voltage levels, feeder loading, feeder loading; basic design practice of the secondary distribution system, Design ratings of distribution substation; derive benefits through optimal location of substations, Voltage drop and power –loss calculations: Derivation for voltage drop and power loss in lines, manual methods of solution for radial networks, thee phase balanced primary lines,Fault calculations. Protective devices: Principle of operation of Fuses, circuit reclosure, line sectionalizes and circuit breakers, Coordination of protective devices: general Coordination procedure, Capacitive compensation for power factor control, Different types of power capacitors , shunt and series capacitors, effect of shunt capacitors(fixed & switched), Power factor correction, capacitor allocation. Economic justification. Procedure to determine the best capacitor location. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 3142	Electrical Installation & Wiring Design: This course enables the student to understand the concepts of Familiarize and apply the electricity safety rules and first aid methods, Identify and review Ohm's law, Resistance, Capacitance, and Inductance in Insulation work. Identify the power factor of AC motor and its Improvement, Define Intensity including Maintenance factor, Co-efficient of Utilization, Differentiate between different types of lighting sources, Calculate the lighting requirements, Recognize the Stroboscopic effect , Differentiate between different kinds of insulation materials like cables, jointing and conduits, Compare between lighting circuits and power circuits, Differentiate between radial and ring circuits, Differentiate between different insulation systems like	5	3



	industrial insulation system, multi-store commercial insulation system and domestic insulation system, Specify alarm and emergency system and central heating system, Define the purpose of earthing, Present different earth protections, Design an Insulation system including current, nominal setting of protection, correction factor, current carrying capacity, choice of cable size and thermal constraints. This course also covers the laboratory experiments based on the outcomes mentioned above.		
EEPW 3257	Power Electronics: This course focuses on the , Define the power diodes, thyristors, power MOSFET, G.T.O., IGBT, field controlled switches (SiT and SiTH), Compare between different types of semiconductor switches, Draw the desired characteristics of controllable switches, Compare between different types of converter, Differentiate between Uncontrolled rectifiers and controlled rectifiers, Apply the knowledge of :AC/DC converter, DC/DC converter, DC/AC converter, d- d- Resonant converter, Working of different types of AC/DC regulated power supply. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
ENGL 3100	Public Speaking: To introduce the student to the principles of public speaking to foster critical thinking and to equip him/her with the skills necessary for producing effective and credible presentations that are suitable for their audiences and purposes. The course enables students to understand the basic principles of public speaking and the different types of presentations suited to different audiences and purposes.	4	3
EEPW 3200	Control System: This course enable the student to understand the concepts of the time response analysis of first and second order systems, determine the impulse and step responses, steady state error etc, the stability analysis in time domain using Routh – Hurwitz criterion and root locus methods, Construct the root locus diagrams, study the stability and applications of root locus diagrams, the stability analysis in the frequency domain, using Polar plot and Bode plot, magnitude-phase plot, the Nyquist stability criterion, relative stability, gain margin and phase margin, Study the use of Nichols chart to find relative stability, the cascade and feedback compensation. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 3258	Machines & Drives: This course enable the student to understand the concepts of Describe different methods of controlling DC drives like rectifier control, chopper control and two and four quadrant controls, Describe the structure and operation of induction machines, Describe the structure and operation of synchronous machines, Design the rotor for given starting torque and output power, Analyze the steady-state equivalent circuit and near synchronous speed equivalent circuit, Measure the parameters of both induction and synchronous machines, Differentiate between different variable control operations in induction drives like variable-voltage operation, variable-frequency operation, variable-current operation and variable-voltage-frequency operation, Explain the effects of voltage harmonics space harmonics, Describe the structure of different synchronous drives like switched reluctance motor drives and stepper motor drives, Differentiate between different variable-frequency synchronous motor drives systems like open-loop drive system, self-contained drive systems. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 3152	Power System Analysis: This course enable the student to: Understand the concepts of Review the basic concepts of three-phase power system and reactive power flow, Define the transmission line parameters and use them to determine transmission line properties, Analyze power system using single line and reactance diagrams, Explain the power factor correction methods and static var compensation, Analyze the power-flow in a power system using Gauss Seidel and	4	3



	Newton-Raphson, Explain series R-L circuit transients, short circuit currents and reactance of synchronous machines, Recognize the development of internal voltages of loaded machines under fault conditions, Break down unbalanced currents into symmetrical components, Represents unbalanced system by sequence networks, Apply Z bus for fault for fault analysis, Determine the fault currents due to unsymmetrical fault conditions like single line to ground, line to line and double line to ground, Compute the loads between plants for economic distribution of power, Determine the economic dispatch of power under transmission power loss conditions, State B-coefficient, penalty factor and unit commitment. This course also covers the laboratory experiments based on the outcomes mentioned above.		
EEPW 3300	Energy Conversion Systems: This course enable the student to familiarize and understand the concepts of Comprehend the various form of non-conventional energy sources, Realize the fundamentals of solar energy conversion and photo cells, Grasp the principle of biochemical energy conversion and the biogas engine cum generator, Conceive the design aspects of wind energy components, Arrange and maintain a wind energy conversion system, Devise the general lay out and maintenance of various types of water based systems such as OTEC, wave energy, tidal energy, small mini micro system, Anticipate an overall scenario of geo-thermal energy conversion and nuclear fusion based power generation systems. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EETE 3399	Higher Diploma Project: To expose each student to the situation where he/she works individually or on a team in a project in the field of engineering. The course will enable the student to integrate the various areas of knowledge he/she gained through the program and to consolidate personal confidence in working independently or as a team and improve his/her spirit of performance.	6	3



ENGINEERING DEPARTMENT
COURSE DESCRIPTION
ELECTRICAL ENGINEERING PROGRAM (BACCALAUREATE LEVEL)

Course Code	Course Title and Description	Contact Hours	Credit Hours
MATH 4130	Probability & Statistics: This course deals with describing and summarizing data: data and variables, description of the observed distributions, histograms, linear relationships, multiplicative and additive structures in two-way tables. Probability and probability distributions: Observations and events, the axioms of probability theory, conditional probabilities, discrete and continuous random variables, mean values and variances, special discrete and continuous distributions. Inferences based on samples: Chebyshev and Rsquo's rule, the central limit theorem, estimation with confidence intervals, the t-statistic, and one sided and two sided tests about a population mean.	3	3
EECP 4192	Software Engineering: This course enable the student to, Understand the object-oriented programming paradigm, Reuse mechanisms in object-oriented languages, Specify requirements and use case, Analyze and design programs using object-oriented methodologies, Design patterns, Unify modeling language. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 4153	Transient System Stability: The course will enable the student to: Understand the multifaceted aspects of transient stability from physics description and formulation of the problem, Know the methods of transient stability, and Understand the concepts extended equal-area criterion. Steady state and transient stability, voltage stability. Model of the power system to study the transient stability. Transient stability by numerical methods, equal area criteria, extended area criteria to study PSS, different energy swing equation, energy function methods to study stability, Power flow and improving stability, study of transient disturbances. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 4180	Numerical Methods in Power Systems: The course will enable the student to: efficient in data power flow studies, Static load flow equations, Load flow solutions using Newton Raphson method and Gauss Seidel Methods. Solve problem by using Newton Raphson Method in polar and rectangular coordinates. Apprehend 3- phase symmetrical fault analysis and unsymmetrical fault analysis. Grasp elementary idea of steady state, Dynamic and transient stabilities. Produce simulation of swing equation using numerical methods. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
PHIL 4100	Oman Civilization: To acquaint the student with Omani and Islamic civilization, their development and significance during different pre- and post-Islam eras, and with the Islamic judicial system. The course enable the student to: Understand the geography of Oman, Be familiar with the significance of Omani civilization during pre- and post-Islam eras, Understand Islamic civilization, its development, and its supporting factors, Understand the Islamic judicial system during different post-Islam eras.	4	3
EEPW 4259	High Voltage Engineering: This course will enable the student to: Know the methods of generation of high DC and AC voltages and controlling methods, Understand the breakdown phenomena in gaseous, liquid and solid media, Know different ways of high voltage measurements and testing, understand the concept of over voltage and principles of insulating coordination. Study of high voltage and extra high voltage transmission, types of insulators, transformer oil, H.V.	4	3



	cable insulation, testing methods for insulation, insulators, Transformer, circuit breaker oil. Extra HVDC. High voltage circuit breakers,. CT, PT, Capacitor voltage transformer, Impulse generator, HV DC power supply kit, Transformer Oil testing equipment. This course also covers the laboratory experiments based on the outcomes mentioned above.		
EEPW 4254	Switchgear and Protection: This course will enable the student to: Introduce with the theoretical principles and current state of the art of switchgear and protection Engineering. Understand the concepts of circuit interruption and protection. Understand the concepts of circuit breaker as a kind of protection. Understand the concepts of analogue protection. Understand the concepts of digital protection. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EECP 3171	Microprocessors System & Interfacing: This course enables the student to investigate the basic architecture for a microprocessor based system and study the specifications and functions of its parts. Also this course enables the student to write software for microprocessor based system using both programmable and non-programmable interface devices. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 4256	Power Stations: This course will enable the student to: Understand the concept of load curves, Know different types of power stations, and Know different types of power substations, Understand the concepts of energy tariff. Study of Thermal, Nuclear, Hydro, Diesel, gas turbine power stations, Non-conventional power generation, Maintenance and operation of Gas-turbine generating station and the Sub-Stations, Power plant economics and tariffs, economic operation of Power systems, development of Non-conventional power generating stations. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 4299	B.Tech. Project 1: To expose each student to the situation where he/she works individually or on a team in a project in the field of engineering. The course will enable the student to integrate the various areas of knowledge he/she gained through the program and to consolidate personal confidence in working independently or as a team and improve his/her spirit of performance.	6	3
EEPW 4255	Power System operation & Reliability: This course should enable the student to: Understand and explore a number of engineering matters involved in operating, controlling of power generating and transmission systems and to understand the application of reliability concepts in enhancing power system security. Concept of reliability in enhancing power system security, thermal unit constraint, hydro constraint, priority-list methods, dynamic programming, contingency analysis, AC load flow, Tie-line control, reliability functions, Markov's process. This course also covers the laboratory experiments based on the outcomes mentioned above.	4	3
EEPW 4299	B.Tech. Project 2: To expose each student to the situation where he/she works individually or on a team in a project in the field of engineering. The course will enable the student to integrate the various areas of knowledge he/she gained through the program and to consolidate personal confidence in working independently or as a team and improve his/her spirit of performance.	6	3