

English Communication (ENG 101):	English Communication is a first-semester ESP course designed for students who have successfully completed the Foundation Program and are now enrolled in the Associate Degree programs in the Royal Commission at Yanbu's colleges and institutes division. The course solely focuses on communication for the workplace. Students are exposed to the elements of business letters and to the basics of oral communication in professional settings. Students will write claim, and adjustment letters, and actively take part in group discussions, debates, and deliver effective oral presentations.
Calculus I (GSMA101):	Calculus I deals with the concept of differential calculus needed in mathematics, science, and technology. Topics include limits and continuity, differentiation of algebraic and transcendental functions, and partial differentiation. Emphasis is given to the applications of continuity, derivatives, and partial derivatives. Application problems will be solved during problem-solving sessions.
Engineering Drafting (ENGT101):	This course is an introduction to technical drawing and computer-aided drafting. The instructional program involves the use of drafting instruments, sketching, lettering, geometric constructions, multiview projections, pictorial drawings, dimensioning, surface development and piping drawings. Internationally recognized drafting standards and conventions are applied throughout the course. The course prepares the students to read and interpret technical drawings and construct engineering drawings by using CAD software.
General Physics (GSPH101):	General Physics is an algebra-based course. The aim of this course is to provide students with basic principles of general physics to support applied fields. It deals with measurements, motion in 1-D and 2-D, dynamics, work and energy, fluids, heat, electrostatics, electricity, magnetism, and light. Laboratory activities reinforce the theoretical aspects of the course.
Physical Education (GSPE101):	Physical Education includes activities designed to improve students' physical health, well-being, and fitness levels, helping them achieve the fitness standards expected of college students. This involves various physical exercises and activities to promote fitness and health.
Plant Maintenance (MCET101):	This course introduces the student to advanced knowledge of mechanical maintenance, functions and techniques, including preventive maintenance, predictive maintenance, non-destructive testing, troubleshooting and fault diagnosis, lubrication, bearing types, sealing, levelling, alignment and installation of mechanical equipment's, maintenance of

	power plants, pump stations, hydraulic and pneumatic systems.
Mechanical Measurements (MCET102):	This course enables the student technicians to gain knowledge and develop their skills using measuring tools and equipment utilizing both the English and S.I. unit systems. The student will learn to measure with rules, tapes, callipers, verniers, micrometers gauges, indicators, sine bar and universal protractor. The course is supported by laboratory experiments.
General Chemistry (GSCH101):	General Chemistry is intended to provide students with the knowledge and skills for understanding the basic principles of chemistry. The course covers topics on atomic structure, chemical bonding, gases, thermochemistry, solutions, kinetics, chemical equilibrium, acids and bases, electrochemistry, and modern materials. The course is supported by digital media, both on CDs and online, and by experiments in the laboratory and in virtual chemlab using chemlab software.
English Composition (ENG 102):	English Composition is a second-semester ESP course designed for students pursuing their undergraduate studies in Mechanical, Electrical, Chemical, or Electronic Engineering at Yanbu Industrial College, part of the Colleges and Institutes of the Royal Commission at Yanbu, where the medium of instruction is English. Successful completion of ENG 101 - Communication is a prerequisite for this course. This course is part of the Associate Degree Program and focuses on written technical communication for the workplace. Students are exposed to the fundamentals of technical writing, produce graphs and charts, and participate in group work and effective oral presentations.
Calculus II (GSMA102):	Calculus II deals with the concepts of integral calculus needed in mathematics, basic science, and technology. Topics include integration, techniques of integration, definite integrals and their applications, numerical integration, and differential equations.
Machining Processes I (MCET103):	This course provides the student with an understanding of basic machine shop processes. It deals with use of cutting tools and procedures, handsaw, contour handsaw, reamers and taps, lathe machines, drilling machines, shaping machines, milling and grinding machines. The course is supported by workshop training to study the construction and verification of characteristics of these workshop machines, procedures and their operations in typical machining exercises. Safe working practices will be stressed during all laboratory activities.

Materials Technology (MCET104):	This course introduces the principles of manufacture of ferrous and non-ferrous metals and their alloys, thermal insulating, and corrosive resisting materials. The course covers the basics of physical metallurgy, powder metallurgy, shaping, forming, casting, plastic molding, heat treatment processes and joining techniques of industrial materials. Laboratory applications focus on physical microstructure examination of engineering materials. The student receives appropriate practical experience in carrying out heat treatments and the study of their effects on the material, microstructures and mechanical properties.
Applied Statics (MCET105):	This course deals with the fundamental concepts and principles of applied mechanics. It covers force components, moments and couples, and computation of the resultant of coplanar system of forces. It also considers the equilibrium of a particle & rigid body, analysis trusses, frames and machines. It further considers problems related to centroid, centre of gravity & friction. The course also introduces the kinematics of rectilinear and curvilinear motion of particles and rigid bodies, and simple harmonic motion.
Applied Statistics (GSST201):	Applied Statistics deals with statistical concepts and techniques commonly used in data analyses, particularly in science and technology. Topics include data collection and sampling techniques, frequency distributions and graphs, basic statistical measures of central tendency and variability, probability and counting rules, normal distribution, hypothesis testing, correlation and regression, reliability and failure data analysis, and quality control charts. Application problems will be solved during problem-solving sessions.
Industrial Safety (ENGT201):	provide students an insight of safer workplace, and to develop their skills in hazard recognitions, minimization of hazards and risk management. This course will cover in detail the industrial safety principals & practices in the workplace and the environments mainly in Mechanical, Electrical, Chemical and Industrial sectors. Topics include flash point, fire extinguishers, radioactive substances, pressurized containers, confined areas, symbol, tags, signs, the work environment, Personal Protective Equipment (PPE), safety practices of handling chemicals in laboratories, accident prevention, employer safety responsibilities, safety regulations of OSHA and NFP A.
Computer Programming (ELET104):	This course introduces techniques to solve problems through computer programming using high level computer language 'C'. The students will learn problem solving techniques, basic programming concepts such as input/output statements and control statements, use of subprograms and structured data

	types such as arrays, pointers and structures. The course is supported by exercises in the laboratory.
Industrial Electricity (ELET204):	This course deals with the fundamentals of DC and AC circuits, DC and AC machines and electronic logic control circuits. The first part is devoted to study DC circuits. The second part considers both single phase and three phase AC circuits. DC and AC machines widely used in electric power plants are covered in the third part. Basic principles of semi-conductors and their applications in control circuits are studied in the last part of this course.
Mechanical Drafting (MCET201):	This course is designed to prepare the students to create and interpret working drawings. Topics covered include representation of threaded and non-threaded fasteners, gears, springs, rivets and welded joints. Application of dimensional and geometric tolerances, surface roughness symbols in production drawings is covered. Students are also introduced to the basic concepts of 3D modelling. The media of application varied from standard drafting instruments to the state of the art in computer aided design and drafting tools.
Applied Thermodynamics (MCET211):	This course starts with defining renewable and non-renewable energy sources, types and its applications. It introduces the student to the basic concepts of thermodynamics including pure substance, ideal gas, system, boundary and surrounding. The concepts of the Zeroth, First and Second Law of thermodynamics are introduced. It also discusses thermal engineering system including, heat engines, refrigeration. Students will study the analysis of the thermal systems by applying first and second law of thermodynamics.
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Fluid Machines (MCET212):	The course provides students with an understanding fluid at rest, in motion and interactive forces between fluids and bodies. The course includes applications of fluid mechanics in pipelines and fluid machines such as pumps, turbines and an introduction to compressible fluid machines. The course is also supported by laboratory activities.

Technical Report Writing (ENG201):	ENG 201 -Technical Report Writing is a third-semester ESP course designed for students in the final year of the Associate Degree Program. This course solely focuses on writing reports. It aims at developing and enhancing students' ability to plan, draft and produce a wide range of reports used in the professional world, and to improve their effectiveness by incorporating graphics, visuals and other elements.
Islamic Ideology and Thoughts (GSIS101):	This study provides a detailed exploration of Islamic faith, its pillars, and invalidators, along with insights into the Islamic perspectives on family and work ethics. It covers the meaning and concept of faith and how it influences belief, behavior, and actions. The six pillars of faith—belief in Allah, angels, messengers, the Last Day, and divine destiny (Qadar)—are examined for their individual and collective significance. The study also highlights the transformative effect of genuine faith on both individuals and society. Additionally, it addresses the invalidators of faith and contemporary challenges such as secularism and Westernization. The course concludes with an overview of the Islamic family system and the ethical principles governing work in Islam.
Industrial Supervision (ENGT202):	This course provides students with knowledge and understanding of what industry is and the role of supervision in it. First it discusses the evolution, the meaning and types, the impact of technology, and the factors that influence the location and development of industries in Saudi Arabia. Secondly, it deals with the nature and skills of supervision and functions and responsibilities of supervisors in industries.
Equipment Maintenance (MCET213):	This course is designed to equip, and enable the students as mechanical maintenance technicians through the skilled application of engineering knowledge. It provides a comprehensive understanding of predictive maintenance strategy in newly established state-of-the art lab to achieve high plant availability and optimize on product quality. The course covers the basic maintenance techniques such as condition monitoring, vibration analysis, alignment and rotor balancing to eliminate mechanical breakdowns, technical disruptions and equipment failure in a production environment. Hands-on practice for the replacement of dynamic and mechanical seals is performed. The course also covers the applications, troubleshooting and maintenance of different mechanical components and equipment such as valves, pumps, compressors, couplings and gear reducers including fault diagnosis, inspection, dismantling, repair and reassembly.
Heat Exchangers (MCET214):	This course introduces the student technician to the theory of heat transfer (conduction, convection, radiation), heat

	transmission during evaporation and condensation in heat exchangers; descriptions of heat exchanger type and performance (flow arrangements, logarithmic mean temperature difference and effectiveness), descriptions of some heat exchange applications such as boilers and evaporators, principles of desalination and solar energy applications are included. Laboratory experiments will support the course.
ELECTIVES* Refrigeration and Air Conditioning Technology* (MCET217*):	The course is designed to provide student technician with theoretical and practical skills in refrigeration and air conditioning. The course content includes refrigeration principles covering topics of simple and actual vapor-compression cycles, refrigerants, multi-pressures, multi-stage & cascade, and theory and operation of refrigeration components. Air conditioning principles covers the topic of psychrometry, psychrometric processes, and basic load estimations. Fundamental maintenance services and procedures are also included. This course is supported by laboratory exercises.
Hydraulics and Pneumatics Technology* (MCET219*):	This course is directed to study the design, principal of operation and calculation of fluid power systems (hydraulic and pneumatic). In addition, a special attention will be paid to cover the construction, troubleshooting and maintenance of fluid power systems and their industrial applications. Also, the course will cover a good theoretical base of fluid power systems which enables the further study analysis of the static and dynamic performance of different elements of fluid power systems.
Applied Strength of Materials* (MCET222*):	This course deals with the principles of strength, stresses and strains. Problem- solving skills are developed in areas of simple axial stresses, shear stress, stresses in beams, stresses in shafts, impact stresses, combined stresses and buckling of columns. Laboratory experiments cover the area of materials testing; including tension, compression, torsion, bending, shear, impact and hardness.
Co-op Training (MCET310):	The cooperative method of instruction is used to enhance student knowledge and skills and to gain practical experience. For the coop training each student will have a learning plan, signed by the student, instructor, and Coop employer. This plan includes instructional objectives and a list of on-the-job and, when applicable, class room learning and experiences. This plan will identify a work station and equipment, skills and tasks relevant to the student's area of specialisation. This training program lasts 14 weeks and is done at the end of the academic program.