

Advanced Diploma in M&E Engineering (Building)

Key items	Course			
Course Title:	Advanced Diploma in M&E Engineering (Building)			
Course Unit Code:	ADME			
Course Overview:	<p>The Advanced Diploma in Mechanical and Electrical Engineering' is a top-up programme for those who have successfully completed the 'Diploma in Mechanical and Electrical Engineering' course. This programme's aim is to educate students with key skills required for analysing, solving technical problems, and effective decision making.</p> <p>This programme develops students to be competent Mechanical and Electrical Engineers or Coordinators by equipping them with the knowledge of Mechanical and Electrical Engineering concepts, methods, and essential tools & techniques.</p> <p>The level of study enables learning growth in students, thus meeting the demands of today's employers such as employability skills, innovation, and productivity. It is important to have thorough knowledge on the Mechanical and Electrical Engineering service core topics such as Fluid Mechanics, Dynamics of Machinery, Electrical Power, AC & DC Circuits and Distribution, CAD software, Intelligent Building and BIM.</p>			
Course Structure:	No	Module Code	Module Title	Contact Hours (Exclusive of 3 hrs examination)
	1	FM	<p>Fluid Mechanics</p> <p><u>Aim/Objective</u> The aim of this unit is to extend learners' knowledge of the principles of fluid mechanics and the techniques used to predict the behaviour of fluids in engineering applications.</p> <p><u>Learning Outcomes</u></p> <ul style="list-style-type: none"> • Determine the behavioural characteristics and parameters of static fluid systems • Understand the effects of viscosity in fluids • Determine the behavioural characteristics and parameters of real fluid flow • Understand the operating principles of hydraulic machines. <p><u>Topics</u> 1. Static Fluid and concept of pressure.</p>	24

Key items	Course		
			2. Hydraulic pressure 3. Fluids viscosity 4. Newtonian and non-Newtonian fluid characteristics 5. Fluid flow phenomena 6. Hydraulic machines
	2	ACDC	<p>AC & DC Circuit Analysis</p> <p><u>Aim & Objectives</u> The aims and objectives of Circuit Analysis can be summarized as developing the ability to analyse linear systems at an appropriate level of accuracy. This should be achieved with speed and efficiency, using appropriate tools, and with a high degree of confidence in the outcome.</p> <p><u>Learning Outcomes</u> After completing the course the student should be able to analyze a DC or an AC electric circuit using the techniques learned in class. The student should be able to simplify electric circuits and obtain their equivalent circuit. In addition, the student should be able to solve circuit problem containing operational amplifiers. The student should be able to perform sinusoidal steady-state power calculations and to analyze first order RC, RL, and RLC circuits. The student should be able to draw and interpret schematic diagrams of electric circuits and recognize the symbolic representation of the basic circuit elements.</p> <ul style="list-style-type: none"> • The responsibility of a professional to work through a problem until they have total confidence in the outcome • This is the major focus of the subject. For a complete listing of the knowledge domain see the subject description. Emphasis is on time and frequency responses. The purpose is to show how classical differential equation solution techniques and Laplace transforms can be applied to electrical circuits

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			<p><u>Topics</u></p> <ol style="list-style-type: none"> 1. Introduction to Electrical Circuits Circuit Concept 2. Magnetic Circuits 3. Single Phase A.C Circuits 4. Three Phase Circuits 5. Network topology 6. Network theorems (without proofs) 7. Transient Analysis 8. Network Parameters
	3	SM	<p>Strength of Materials</p> <p><u>Aim & Objectives</u></p> <ul style="list-style-type: none"> • This subject is useful for a detailed study of forces and their effects along with some suitable protective measures for the safe working condition. This knowledge is very essential for an engineer to enable him in designing all types of structures and machines. • To develop the theoretical basis and to derive the theories of the strength of materials with sound mathematical principles and to enable students to systematically solve engineering problems regardless of difficulty. • Students should be able to develop confidence and competence in solving intermediate to advanced level of strength of materials problems for design purposes. <p><u>Learning Outcomes</u></p> <p>Fundamental concepts of Strength of Materials and definition of simplified models for the interpretation of the stress and strain states in linear elements, related to effects of normal stress (tension-compression) and bending moment (plane and curved bending), present in statically determinate or statically once indeterminate frame structures. Understanding the functioning of a structure in Ultimate Limit State (General Criteria for Safety Verification).</p>

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			<p><u>Topics</u></p> <ol style="list-style-type: none"> 1. Stress, Strain And Deformation Of Solids 2. Mechanics: Statics and Dynamics 3. Transverse Loading On Beams 4. Stresses In Beams 5. Torsion 6. Analysis Of States Of Stress (Two Dimensional) 7. Deflection Of Beams 8. Energy Principles
	4	PW	<p>Power</p> <p><u>Aim & Objectives</u> This unit will develop learners' understanding of electrical power systems and power distribution and the advantages and disadvantages of alternative energy sources.</p> <p><u>Learning Outcomes</u> On successful completion of this unit a learner will:</p> <ul style="list-style-type: none"> • Be able to analyse three-phase systems • Understand the sources and effects of harmonics in power systems • Understand methods of power distribution • Understand the economics of components, power systems and alternative energy <p><u>Topics</u></p> <ol style="list-style-type: none"> 1. Be able to analyse three-phase systems 2. Understand the sources and effects of harmonics in power systems 3. Understand methods of power distribution 4. Understand the economics of components, power systems and alternative energy
	5	AME	<p>Analytical Methods of Engineers</p> <p><u>Aim & Objectives</u> This module will enhance the analytical understanding and techniques which helps in solving</p>

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		<p>varied engineering tasks and forms the base for other engineering modules</p> <p><u>Learning Outcomes</u></p> <ol style="list-style-type: none"> 1. Analyse and model engineering situations and solve problems using algebraic methods 2. Analyse and model engineering situations and solve problems using trigonometric methods 3. Analyse and model engineering situations and solve problems using calculus 4. Analyse and model engineering situations and solve problems using statistics and probability <p><u>Topics</u></p> <ol style="list-style-type: none"> 1. Algebra 2. Trigonometry 3. Hyperbolic functions 4. AP and GP 5. Calculus – integration and differentiation 6. Statistics 7. Probability 	
	6	<p>EPME</p> <p>Engineering Principles (M&E)</p> <p><u>Aim & Objectives</u> Engineering Science provides students with the basic understanding of the fundamental principles involved in Mechanical and Electrical engineering which forms the base for many engineering design and operation.</p> <p><u>Learning Outcomes</u></p> <ul style="list-style-type: none"> • Determine the behavioural characteristics of elements of static engineering systems • Determine the behavioural characteristics of elements of dynamic engineering system • Apply DC theory to solve electrical and electronic engineering problems • Apply single phase AC theory to solve electrical and electronic engineering problems • Determine the behavioural characteristics of materials 	24

Key items	Course		
			<p>subjected to complex loading systems</p> <ul style="list-style-type: none"> Determine the behavioural characteristics of loaded beams and cylinders Determine the dynamic parameters of power transmission system elements Determine the dynamic parameters of rotating systems <p><u>Topics</u></p> <ol style="list-style-type: none"> Beams, Columns and Shaft AC Circuits DC Circuits RLC Circuits Transformers Stress and Strain Shear Force Relation Between bending moment, slope and deflection Rotating Objects
	7	MEMM	<p>Mechatronics Systems</p> <p><u>Aim/Objective</u> This unit will develop learners' understanding of a range of mechatronic systems that are used in industrial and domestic environments and enable them to produce specifications for mechatronic products.</p> <p><u>Learning Outcomes</u></p> <ul style="list-style-type: none"> Understand the applications of a range of mechatronic systems and products Understand electro-mechanical models and components in mechatronic systems and products Produce a specification for a mechatronic system or mechatronic product Apply mechatronic design philosophies to carry out a design analysis. <p><u>Topics</u></p> <ol style="list-style-type: none"> Robotics: Introduction Robotics : Kinematics of Manipulators

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			3. Programmable Logic Introduction 4. Programmable Logic Controllers 5. PLC programming 6. Applications of PLC 7. Power Electronics
	8	SRM	<p>Safety and Risk Management</p> <p><u>Aim/Objective</u> This Module aims to provide learners with an understanding of health and safety planning, implementation and legislation within an engineering environment. This unit has been designed to develop the learner's awareness of the principles, planning and implementation of health and safety practice within an industrial environment such as those to be found in engineering production, manufacture, services and maintenance and those in the chemical, transport and telecommunication engineering industries. In particular, the selection, application and evaluation of safe working procedures, for operations appropriate to particular industrial activities, are first considered. Then current health and safety legislation, safety audits and current codes of practice are covered. Next, risk is assessed and evaluated by identifying, rating and assessing the severity of hazards and recording all evidence and actions taken for future monitoring of these hazards. Finally, risk management activities are considered including the methods used for gathering evidence, disseminating information, complying with current regulations and implementing policy to minimise risk to life and property, for activities within a general engineering environment</p> <p><u>Learning Outcomes</u> On successful completion of this unit a learner will:</p>

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			<ul style="list-style-type: none"> • Be able to select and apply safe working procedures to engineering operations • Understand the nature and use of current health and safety legislation • Be able to analyse engineering activities for the assessment of risk • Be able to manage and minimise risk to life, property and engineering activities within an industrial environment. <p><u>Topic</u></p> <ol style="list-style-type: none"> 1. Safe working procedures 2. Permit-to-work 3. Isolations 4. Monitoring equipment 5. Protective clothing and equipment: 6. Current regulations 7. Safety audits 8. Codes of practice 9. Hazard 10. Risk rating 11. Frequency 12. Severity 13. Record 14. WSH in Singapore 15. Risk Management and Risk Assessment
	9	MEE	<p>M&E Equipment</p> <p><u>Aim & Objectives</u> To expose the students to the basic principles of Electro mechanical Energy Conversion in Electrical Apparatus and the operation of Transformers and DC Machines.</p> <ul style="list-style-type: none"> • To familiarize the constructional details, the principle of operation, prediction of performance, the methods of testing the transformers and three phase transformer connections. • To study the working principles of DC machines as Generator and Motor, types, determination of their no-load/load characteristics, starting and methods of speed control of motors.

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			<ul style="list-style-type: none"> To estimate the various losses taking place in D.C. machines and to study the different testing methods to arrive at their performance. To educate the student about the nature and concepts of Green technology and sustainable environment , and to provide information about sustainability issues in construction relating to energy management, waste management, the indoor environment, and specific design issues <p><u>Learning Outcomes</u></p> <ul style="list-style-type: none"> Demonstrate knowledge of electrical supply equipment and be able to make selections from theoretical considerations. Analyse and describe aspects of the construction, principle of operation, applications, methods of speed control, and methods of direction reversal of d.c. machines Gain better understanding of Green Mark legislation criteria and framework Apply Green Mark criteria earlier in the life of project and compute assessment score. Facilitate an integrated design and verify compliance to Green Mark standards. Issues related to the integration of passive designs, co-operation between disciplines in the design, and optimising of energy use in buildings <p><u>Topics</u></p> <ol style="list-style-type: none"> Introduction Transformer Electromechanical Energy Conversion Basic Concept in Rotating Machines DC Machines ACMV
	10	OS	<p>Occupational Skills</p> <p><u>Aim & Objectives</u></p>

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		<p>This unit provides learners with the opportunity to acquire effective occupational skills required for effective employment. Learners at all levels of education and experience require honed employability skills as a prerequisite for entering the job market. This unit gives learners an opportunity to assess and develop an understanding of their own responsibilities and performance in, or when entering, the workplace. Learners will consider the skills required for general employment such as interpersonal and transferable skills, and the dynamics of working with others in teams or groups including leadership and communication skills. This unit also deals with the everyday work requirement of problem solving which includes the identification or specification of the 'problem', strategies for its solution and the evaluation of the results through reflective practices.</p> <p><u>Learning outcomes</u> On successful completion of this unit a learner will:</p> <ul style="list-style-type: none"> • Be able to determine own responsibilities and performance • Be able to develop interpersonal and transferable skills • Understand the dynamics of working with others • Be able to develop strategies for problem solving <p><u>Topics</u></p> <ol style="list-style-type: none"> 1. Sharpening Your Basic Skills 2. The importance of Industrial Relations and Discipline 3. Motivating and Leading employees at work 4. Setting objectives and conducting Performance Appraisal 5. Authority, Responsibility and Accountability 6. Problem solving and Decision Making

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			7. The Importance of Working in a Team 8. Communicating Effectively with Employees 9. Instilling Positive Work Attitude
	11	PT	<p>Project</p> <p><u>Aim & Objectives</u> The project aims to develop the ability of students to integrate the skills learnt in the modules of the course into a 'total' Construction management solution. To develop and demonstrate simple research of topic proposed by the lecturer that is relevant to their elective to the programme. The student will form a group maximum of 3 persons and complete the project work. The group project will help student to obtain skills like teamwork, integrated project, leadership and organising skills.</p> <p><u>Learning Outcomes</u></p> <ul style="list-style-type: none"> This project is designed to help students further develop their research skills with respect to finding, exploring, reading and learning how to mobilise high quality academic literature. The project also forms a good test of students' grasp of research, essay writing and study skills. These skills will also expose students' grasp of strategic management theory and concepts per se and their connection to practice in the built environment. <p><u>Topics</u> The Project is focused on the application of material presented in all the modules. The assessment of project on below criteria's:</p> <ol style="list-style-type: none"> General Introduction Procedure for Carrying out the Project Contents and Structure The Literature Search Research Methods Writing up & References
Course Duration:	1. Full-time: 12 months		

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	<p>Total Contact hours: 300 (No breaks between exams and modules) Week Schedule: 5 days per week (3 hrs per day)</p> <p>2. Part-time: 12 months Total Contact hours: 300 (No breaks between exams and modules) Weekend: 1 Sunday (8 hrs class) Week Schedule: 1 day per week (8 hrs per day)</p>														
Course Fees:	\$3350 + 9% GST (incl. of non-refundable \$150 application fee)														
Skillsfuture Credit	Applicable for Singapore Citizens over 25 years old														
Mode of Instruction:	Classroom-facilitated learning														
Mode of Delivery:	Part-Time														
Mode of Assessment:	100% Written Examinations														
Attendance Requirement:	A 75% minimum attendance is required for student.														
Passing Criteria:	A 50% passing rate all for assessment components is required for the student.														
Grading:	<table border="1"> <tbody> <tr> <td>A+</td> <td>100%</td> </tr> <tr> <td>A</td> <td>90% to 99%</td> </tr> <tr> <td>B</td> <td>80% to 89%</td> </tr> <tr> <td>C</td> <td>70% to 79%</td> </tr> <tr> <td>D</td> <td>60% to 69%</td> </tr> <tr> <td>E</td> <td>50% to 59%</td> </tr> <tr> <td>F</td> <td>Below 49%</td> </tr> </tbody> </table>	A+	100%	A	90% to 99%	B	80% to 89%	C	70% to 79%	D	60% to 69%	E	50% to 59%	F	Below 49%
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Qualification:	Having duly completed the approved course of study and passed the prescribed examinations, students will be awarded 'Advanced Diploma in M&E Engineering' issued by Avanta Academy.														
Entry Qualification:	<ul style="list-style-type: none"> Diploma in M&E Engineering (Building) (awarded by Avanta Academy) or other recognised Diploma from other institutions Minimum Grade E in any 3 GCE 'A' Level, including English and 2 Science subjects or equivalent; or Minimum C6 in any 3 GCE 'O' Level, including English and 2 Science subjects (Grade C6 and above) with 3 years' working experience in the engineering field; or Working Experience: Matured candidate with other relevant certificate qualification with 5 years' work experience. 														
Average Teacher to Student Ratio:	1:30														



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Period of Reg: 21/12/2020 - 20/12/2024



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Validity: 25/11/2023 - 24/11/2024