

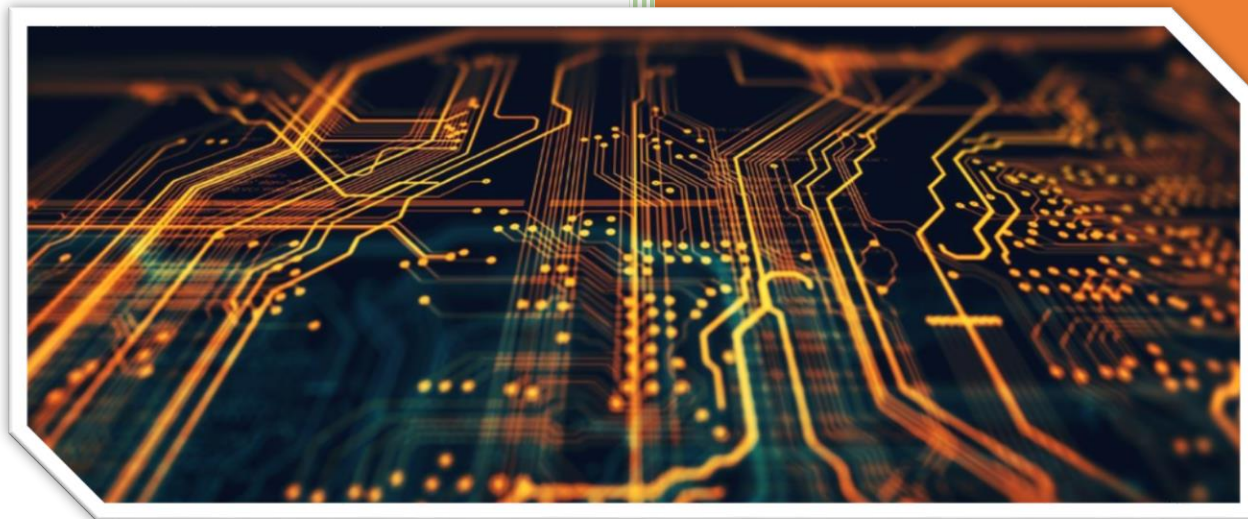


**KEMENTERIAN
PENDIDIKAN
MALAYSIA**



**DIPLOMA IN MECHATRONIC
ENGINEERING (DEM)**

Student's Study Guide (SSG)



**POLITEKNIK SULTAN AZLAN SHAH
35950 BEHRANG
PERAK**

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STUDENT'S STUDY GUIDE (SSG)

*Diploma in Mechatronic Engineering
(DEM)*

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SYNOPSIS
JOB PROSPECT
VISION AND MISION
PROGRAMME AIMS
PROGRAMME EDUCATION OBJECTIVES
PROGRAMME LEARNING OUTCOME

SYNOPSIS

Diploma in Mechatronic Engineering at Polytechnic's Ministry of Education Malaysia is designed to cover the current wide discipline of mechatronic engineering with added specialization subjects in the field of mechatronic engineering. Core courses offered include Engineering Drawing, Mechatronic Workshop Practice, C Programming, Electrical Technology, Thermofluid, Engineering Mechanics, Computer Aided Design, Electronic System, Strength Of Materials, Industrial Electronics, Digital System, Programmable Logic Controller, Control System, Pneumatic & Hydraulics, Power Electronics, Project, Industrial Automation, Power Transmission Mechanism and Embedded System Application.

Graduates are also required to complete one elective course at each semester 5 and 6 with a minimum total of four credits. Elective courses include Microprocessor, CAD/CAM, Industrial Robotics, Industrial Management, C++ Programming, Diagnosis & Troubleshooting for Mechanical Component, Tamadun Islam, Integrasi Malaysia and Computer Application.

Common core courses included in the programme are Occupational Health & Safety, Engineering Mathematics, Engineering Science and Entrepreneurship. Compulsory courses offered include Sains Teknologi dan Kejuruteraan Dalam Islam, Komunikasi dan Penyiaran Islam, Pengajian Malaysia, Nilai Masyarakat Malaysia, Communicative English, Sukan, Kelab/Persatuan, Asas Unit Beruniform dan Unit Beruniform would provide students with interpersonal ability, attitude and professionalism towards their career.

JOB PROSPECT

This programme provides the knowledge and skills in mechatronic engineering field that can be applied to a broad range of careers prospect. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:

Technical Assistant
Production Technician
Test & Reliability Technician
Maintenance Engineer
Sales Engineer
Application Engineer
Controller System Supervisor
Automation and Robotic Supervisor
Mechanical and Electrical System Designer

VISION

Department of Polytechnic Education

To be the Premier Industry-led TVET institution.

MISSION

Department of Polytechnic Education

This mission can be divided into four important components which are:

1. To provide access to quality and recognised TVET programme.
2. To develop industry-led curriculum and enhance graduate readiness through coordinated industry engagement.
3. To produce balanced and enterprising graduate through dynamic and sustainable study programme.
4. To gain international recognition through collaboration and active participations in TVET community.

VISION

Politeknik Sultan Azlan Shah

To become a premier industry-led TVET institution by 2020

MISSION

Politeknik Sultan Azlan Shah

To produce holistic, entrepreneurial and balanced graduates via globally recognized industry-led curriculum through an innovative, dynamic and quality teaching and learning ecosystem.

PROGRAMME AIMS

The Diploma in Mechatronic Engineering graduates in Polytechnics, Ministry of Education will have the knowledge, technical skills, community service responsibilities and attitude to adapt themselves with new technological advancement and challenges in the mechatronic engineering field.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Mechatronic Engineering programme shall produce semi-professionals who are:

1. Competent in knowledge and skills in the field of mechatronic engineering according to industry requirements.
2. Effective in communication and contribute effectively as a team member with the capability of being a leader.
3. Ethically and socially responsible towards developing the community and the nation.
4. Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for a successful career advancement and able to adapt themselves with new technological challenges in mechatronic fields.

PROGRAMME LEARNING OUTCOMES (PLO)

Upon completion of the programme, graduates should be able to:

1. Apply knowledge of mathematics, science, engineering fundamentals and social sciences to well-defined mechatronic engineering procedures and practice;
2. Analyse well-defined mechatronic engineering problems with respect to operation and troubleshooting;
3. Conduct investigations and assist in the design of solutions for mechatronic engineering systems;
4. Apply appropriate techniques, resources, and engineering tools to well-defined mechatronic engineering activities, with an awareness of the limitations;
5. Demonstrate an awareness and consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities;
6. Communicate effectively with the engineering community and society at large;
7. Function effectively as an individual and as a member in diverse technical teams;
8. Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices;
9. Demonstrate an awareness of management and entrepreneurship;

10. Demonstrate an understanding of the impact of engineering practices, taking into account the needs for sustainable development;
11. Recognise the needs for professional development and to engage in independent and lifelong learning.

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Programme Structure for Diploma in Mechatronic Engineering

Programme Structure for Diploma in Mechatronic Engineering

NO	CODE	COURSE (SEMESTER 1)	STATUS	CREDIT HOUR
1	DUB 1012	PENGAJIAN MALAYSIA	C	2
2	DUE 1012	COMMUNICATIVE ENGLISH 1	C	2
3	DRB 1XX0	ASAS UNIT BERUNIFORM	C	0
4	DBM 1013	ENGINEERING MATHEMATICS 1	CC	3
5	DBS 1012	ENGINEERING SCIENCE	CC	2
6	DUW 1012	OCCUPATIONAL, SAFETY & HEALTH	CC	2
7	DJJ 1012	ENGINEERING DRAWING	DC	2
8	DJM1012	MECHATRONIC WORKSHOP PRACTICE 1 - WELDING GAS	DC	2
		MECHATRONIC WORKSHOP PRACTICE 1 - WELDING ARKA		
		MECHATRONIC WORKSHOP PRACTICE 1 - FITTING		
		MECHATRONIC WORKSHOP PRACTICE 1 - MACHINE		
9	DJM 1022	C PROGRAMMING	DC	2
Total credit hour				17

NO	CODE	COURSE (SEMESTER 2)	STATUS	CREDIT HOUR
1	DUA 2012	SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM*	C	2
2	DUB 2012	NILAI MASYARAKAT MALAYSIA**	C	
3	DRS 2XX1	SUKAN	C	1
4	DRB 2XX1	UNIT BERUNIFORM 1 & 2	C	
5	DBM 2013	ENGINEERING MATHEMATICS 2	CC	3
6	DJJ 2022	ELECTRICAL TECHNOLOGY	DC	2
7	DJJ 2062	COMPUTER AIDED DESIGN 1	DC	2
9	DJM 2043	THERMOFLUIDS	DC	3
10	DJM 2012	MECHATRONIC WORKSHOP PRACTICE 1-WIRE CUT	DC	2
		MECHATRONIC WORKSHOP PRACTICE 1-DIE SINKING		
		MECHATRONIC WORKSHOP PRACTICE 1-MILLING		
		MECHATRONIC WORKSHOP PRACTICE 1-TURNING		
11	DJM 2032	ELECTRONIC SYSTEM	DC	2
Total credit hour				17

NO	CODE	COURSE (SEMESTER 3)	STATUS	CREDIT HOUR
1	DUE3012	COMMUNICATIVE ENGLISH 2	C	2
2	DRK3XX2	KELAB/ PERSATUAN	C	2
3	DRB3XX2	UNIT BERUNIFORM 2	C	
4	DJJ 3053	ENGINEERING MECHANICS	DC	3
5	DJJ3103	STRENGTH OF MATERIALS	DC	3
6	DJM 3052	INDUSTRIAL ELECTRONIC	DC	2
	DJM 3063	DIGITAL SYSTEM	DC	3
7	DJM 3072	PROGRAMMABLE LOGIC CONTROLLER	DC	2
Total credit hour				17

NO	CODE	COURSE (SEMESTER 4)	STATUS	CREDIT HOUR
1	DUE5012	COMMUNICATIVE ENGLISH 3	C	2
2	DBM3013	ENGINEERING MATHEMATICS 3	CC	3
3	DJM 5102	POWER ELECTRONICS	DC	3
4	DJJ 5123	PNEUMATIC & HIDRAULIC	DC	3
5	DJM 5092	CONTROL SYSTEM	DC	2
6	DJJ 5141	PROJECT 1	DC	1
7	DJM 5082	MICROPROCESSOR	E	2
		Total credit hour		16

NO	CODE	COURSE (SEMESTER 5)	STATUS	CREDIT HOUR
1	DUA6022	KOMUNIKASI DAN PENYIARAN ISLAM	C	2
2	DPB2012	ENTREPRENEURSHIP	CC	2
3	DJM 6113	INDUSTRIAL AUTOMATION	DC	3
4	DJM 6122	POWER TRANSMISSION MECHANISM	DC	2
5	DJM 6132	EMBEDDED SYSTEM APLICATION	DC	2
6	DBC 2012	COMPUTER APPLICATION	E	2
7	DJJ 6143	PROJECT 2	DC	3
		Total credit hour		16

NO	CODE	COURSE (SEMESTER 6)	STATUS	CREDIT HOUR
1	DUT 40110	INDUSTRIAL TRAINING		10
		Grand Total of credit hour		93

No	Components	Remarks
i	Compulsory	C
ii	Common Core	CC
iii	Discipline Core	DC
iv	Elective	E

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**Course
Synopsis
Course learning Outcome (CLO)**

Course	:	DJM1012 Mechatronic Workshop Practice 1
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

MECHATRONIC WORKSHOP PRACTICE 1 exposes the students to basic works in an engineering workshop with emphasis on safety practices. Students are exposed to fitting, welding and machining.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Practice correct techniques in handling fitting, machining and welding equipments. (P3)
2. Perform fitting, machining and welding works according to Standard Operation Procedure (SOP). (P4)
3. Demonstrate the understanding and awareness of safety procedure in mechanical workshops according to the workshop safety regulations. (A3)

Course	:	DJM1022 C Programming
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

C PROGRAMMING course provides an introduction to programme design and development. Student will learn to design, code, debug, test and document well-structured programs based on technical and engineering problem. Topic covered; software development principle, programming language basic, data types, input and output operation, the use of selection, loops, arrays and function structure.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Apply knowledge of basic concepts of C programming to solve given problem using an appropriate data type. (C3)
2. Construct a high level programming language in solving variety engineering and scientific problems. (P4)
3. Demonstrate problem solving skills in assigned project based on programming. (A3)

Course	:	DJJ1012 Engineering Drawing
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

The ENGINEERING DRAWING course provides the students with the fundamentals of engineering drawings. It emphasizes on the practical knowledge of drawing instruments and drawing techniques that will be applied in workshop practical activities and in Computer Aided Design courses.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:-

1. Apply the basic fundamentals of engineering drawing in comply to related problems. (C3, PLO1)
2. Construct engineering drawings according to the required standards. (P4, PLO 4)
3. Demonstrate the understanding of engineering norms and practices in engineering drawing. (A3, PLO 8)

Course	:	DJM2012 Mechatronic Workshop Practice 2
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

MECHATRONICS WORKSHOP PRACTICE 2 enhances knowledge on CNC and EDM and also enables student to carry out related task scopes. This course also emphasizes on how to operate CNC and EDM machines properly.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, student should be able to:

1. Operate the CNC and EDM machines according to prescribed procedures and manual. (P3)
2. Perform CNC and EDM machine programming. (P4)
3. Demonstrate awareness of safety / health related machine programs to complete certain projects in practical work procedure and practices. (A3)

Course	:	DJM2032 Electronic System
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

ELECTRONIC SYSTEM covers knowledge on basics of electronic concepts and digital systems. The course emphasizes on the electrical characteristics and properties of semiconductor materials, operation of linear DC power supplies, amplifier circuits and sinusoidal wave oscillator circuits.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Analyze the characteristics and properties of semiconductor materials.(C4)
2. Construct electronic circuit based on schematic diagrams.(P4)
3. Demonstrate understanding of electronic circuit.(A3)

Course	:	DJM2043 Thermofluids
Credit (S)	:	3
Pre-Requisite(S)	:	None

SYNOPSIS

THERMOFLUIDS provides students to the basic concepts of thermodynamics and fluids mechanics into one integrated course. This course emphasizes on concepts of conceptual principles in thermofluids, fluids applications, properties of pure substances, first and second law of thermodynamics. This course also provides knowledge and understanding of theory, concepts and application of principles to solve problems related to thermofluids processes.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, the students will be able to:

1. Solve problem correctly related thermodynamics and fluid mechanics with appropriate formula and theories. (C3)
2. Study the theory of thermofluids to solve related engineering problems in group. (A3)
3. Conduct experiments on thermofluids application. (P4)

Course	:	DJJ2022 Electrical Technology
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

ELECTRICAL TECHNOLOGY exposes students to the basic electrical circuit concepts, the application of electromagnetism in electrical machines and transformers. The course focuses on the different types of electrical circuits, the relationship between current and voltage including the resistance. It also provides the skills on the methods of constructing basic circuits and operation of electrical machines and transformers. This course also exposes the students to the demonstration of experiments in Electrical Technology. Exposes the students to practical laboratory experiments in Electrical Technology

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Explain the principles of electrical circuits, electromagnetism, transformers and electrical machines to solve related problems. (C4,PL02)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4,PL04)
3. Demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skills in laboratory report. (A3,PL011)

Course	:	DJJ2062 Computer Aided Design 1
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

COMPUTER AIDED DESIGN 1 provides a comprehensive introduction to Computer-Aided Design software. It is an introductory level where the students will learn to navigate and use the software to create two-dimensional design in engineering. Students shall be able to demonstrate competency in using some standard available features of a CAD application to create and manipulate objects or elements and to modify them. They should be able to change object properties and to undertake printing or plotting activity associated with the delivery outputs. In addition, students are required to use some advanced features of CAD software, such as inserting objects from other applications.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:-

1. Apply the fundamental features of CAD software in producing engineering drawing. (C3, PLO 1)
2. Construct 2D drawing using fundamental features of CAD software. (P4, PLO 4)
3. Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to solve assigned task.(A3, PLO 11)

Course	:	DJM3052 Industrial Electronic
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

INDUSTRIAL ELECTRONIC provides exposure to mechanical, electrical and electronic devices. This course discusses structures of circuits, switches, relays, solenoids, sensors and telemetry systems.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Apply the mechatronic devices, switches, relays, solenoid, electronic control devices, sensor and telemetry system in industrial application. (C3)

2. Construct the circuit of relays and sensors according to operational principle. (P4)
3. Demonstrate the understanding of mechatronic devices. (A3)

Course	:	DJM3063 Digital System
Credit(S)	:	3
Pre Requisite(S)	:	None

SYNOPSIS

DIGITAL SYSTEM provides the knowledge on the concepts and basic principles of digital circuits used in computer systems. This course focuses on sequential logic circuits, counters and registers. This course also covers the topics on the methods of signal conversion in electronic circuits.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Distinguish the characteristics and operations of various digital circuits. (C4)
2. Construct digital circuits based on schematic diagrams. (P4)
3. Demonstrate the role of digital circuits in real world applications. (A3)

Course	:	DJM3072 Programmable Logic Controller
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

PROGRAMMABLE LOGIC CONTROLLER (PLC) provides knowledge regarding the concept and basic principle of automation systems as well as PLC. This course emphasizes on the use, design process, programming and maintenance method of automation systems as well as PLC. This course also provides knowledge and skill training to construct automation systems based on the use of PLC systems.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Organize variant type of automation system achievable with proper PLC selection, maintenance and programming. (C5)
2. Develop the PLC program based on the automation requirements. (P4)
3. Systematize troubleshooting and maintenance of PLC system. (A4)

Course	:	DJJ3053 Engineering Mechanics
Credit(S)	:	3
Pre Requisite(S)	:	None

SYNOPSIS

ENGINEERING MECHANICS focuses on theoretical knowledge in statics and dynamics. This course provides students with fundamental understanding of forces and equilibrium, resultants, equilibrium of a particles and structural analysis. This course also covers kinematics and kinetics of particles. This course also exposes the students to the demonstration of experiments in Engineering Mechanics.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:-

1. Analyze problems related to statics and dynamics based on the concept and principles of engineering mechanics and data from the experiments in relation to the theoretical aspects. (C4, PLO2)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	:	DJJ3103 Strength of Materials
Credit(S)	:	3
Pre Requisite(S)	:	None

SYNOPSIS

STRENGTH OF MATERIALS provides knowledge on concepts and calculation of forces on materials, thermal stress, shear force and bending moment, bending stress, shear stress and torsion in shafts. It also deals with the experiments conducted on tensile test, bending moment, shearing force and torsion and deflection.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:-

1. Analyze problems related to strength of materials and data from the experiments in relation to the theoretical aspects. (C4, PLO2)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	:	DJM5082 Microprocessor
Credit(S)	:	2
Pre-Requisite(S)	:	None

SYNOPSIS

MICROPROCESSOR covers the concept of microprocessor system based on Intel 8086 microprocessor. Student will learn concept of microprocessor 8086, microprocessor architecture, the memory system, interfacing, interrupt, microprocessor's programming and its applications.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:-

1. Explain the concepts of Microprocessor 8086 architecture, memory system, software architecture and assembly language programming for 8086 microprocessor. (C4)
2. Write 8086 Microprocessor Program in assembly language. (P4)
3. Demonstrate interface application of Microprocessor 8086. (A3)

Course	:	DJM5092 Control System
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

CONTROL SYSTEM provides knowledge regarding various concepts of feedback control system and the required mathematical methods. The emphasis of the course is on control action, pneumatic control, hydraulic control and frequency response. This course also provides knowledge in analyzing and designing stability and performance test.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Analyze the basic concept of control system including controller principle, transfer function and stability. (C4)
2. Perform stability and performance analysis on the control system based on stability investigation method. (P4)
3. Demonstrate the ability to work in team for completing assigned task during practical work sessions. (A3)

Course	:	DJM5103 Power Electronics
Credit(S)	:	3
Pre Requisite(S)	:	None

SYNOPSIS

POWER ELECTRONICS provides knowledge on widely used motor control concepts especially those in high power industry. The course focuses on basic concepts of Power Electronic and applications with DC and AC motor control covering construction of DC and AC electrical drives.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Distinguish the characteristics and operations of various power electronic devices, AC & DC converters and electrical drives. (C4)
2. Construct power electronic converter and electrical drive circuits based on schematic diagram. (P4)
3. Demonstrate the understanding and awareness of safety procedure in practical work. (A3)

Course	:	DJJ5123 Pneumatic & Hydraulics
Credit(S)	:	3
Pre Requisite(S)	:	None

SYNOPSIS

PNEUMATICS & HYDRAULICS provides knowledge and understanding to the importance of pneumatics and hydraulics circuits, equipment and design along with its usage in the industry.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Analyze the basic concept and function of pneumatics and hydraulics system.(C4,PLO2)
2. Construct pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks.(C5, PLO3 & P4, PLO4)
3. Demonstrate understanding of engineering norm and practices in pneumatics and hydraulics during practical work sessions. (A3, PLO8)

Course	:	DJJ5141 Project 1
Credit(S)	:	1
Pre Requisite(S)	:	None

SYNOPSIS

PROJECT 1 provides students with solid foundation on knowledge and skills in preparing project proposal, writing and presentation of proposal.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Organize research or project systematically. (C5)
2. Demonstrate good communication skill of oral presentation in group. (A3)
3. Demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skill to develop a project. (A3)

Course	:	DJM6113 Industrial Automation
Credit(S)	:	3
Pre Requisite(S)	:	DJM3072 Programmable Logic Controller

SYNOPSIS

THE INDUSTRIAL AUTOMATION explains advantages and disadvantages of using automation along with a description of the classification systems. It also gives students an understanding of modern industrial automation technology.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Apply the fundamental concept of industrial automation including the mechanical system, actuator control and sensory device. (C3)
2. Develop control structure for industrial automation system based on process specification. (P4)
3. Demonstrate good communication skills in group on assigned topic. (A3)

Course	:	DJM6122 Power Transmission Mechanism
Credit(S)	:	2
Pre Requisite(S)	:	None

SYNOPSIS

POWER TRANSMISSION MECHANISM introduces and reveals element of mechanism movement power and commonly used converter common use. This module includes chain, bearing, gear, cam, followers, coupling, clutch and brake. This module gives knowledge on the working principle of elements power transmission mechanism and students should be able to choose and form power transmission mechanism.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Classify types of power transmission mechanism used in machines. (C3)
2. Analyze the physical dimensions and power transmission mechanism based on utilization and design of machine.(C4)
3. Demonstrate the understanding of engineering norms and practices in solving power transmission mechanism problem. (A3)

Course	:	DJM 6132 Embedded System Application
Credit (S)	:	2
Pre-Requisite(S)	:	None

SYNOPSIS

Embedded System covers the basic concept and application of microcontroller system. Students will be able to learn software and hardware development on microcontroller development system and understand how to interface.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students will be able to:-

1. Explain the theory and basic architecture of microcontroller. (C2)
2. Write program using C language. (A2)
3. Design microcontroller external devices interface. (P5)

Course	:	DJJ6143 Project 2
Credit(S)	:	3
Pre Requisite(S)	:	DJJ5141 Project 1

SYNOPSIS

PROJECT 2 introduces the students to the concepts of conducting a design or case study. The students select a project, list the project's needs, the processes involved, cost estimation, project schedule by applying appropriate methodology in the project planning. It also involves project implementation, project report and presentation.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

1. Develop creative solution to solve the problems in the project design or case study (C5)
2. Organize the selected design or case study based on the project planning (P5).
3. Demonstrate good communication skills of presentation in group. (A3)
4. Demonstrate ability to lead a team to complete assigned project during practical work sessions. (A3)
5. Demonstrate awareness of management, business practices and entrepreneurship related to product of project. (A3)
6. Demonstrate awareness of social responsibility in practical work procedure and practices. (A3)

Course	:	DBM1013 – Engineering Matematics 1
Credit	:	3
Pre requisite	:	None

SYNOPSIS

ENGINEERING MATHEMATICS 1 expose students to the basic algebra including perform partial fractions. This course also exposes the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formula. Students also will be introduced to the theory of complex number and matrices method to solve simultaneous equation. This course also introduces students to concept of vector and scalar

COURSE LEARNING OUTCOME (CLO)

Upon completion of this course, students should be able to:

1. Identify mathematical methods in solving the mathematical problems.(C2, LD1). (C2, LD1)
2. Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1)
3. Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)

Course	:	DBM2013 – Engineering Matematics 2
Credit	:	3
Pre requisite	:	None

SYNOPSIS

ENGINEERING MATHEMATICS 2 exposes students to the basic laws of exponents and logarithms. This course also introduces the basic rules of differentiation concept to solve problems that relate maximum, minimum and calculate the rates of changes. This course also discuss integration concept in order to strengthen student knowledge for solving area and volume bounded region problems. In addition, students also will learn application of both techniques of differentiation and integration.

COURSE LEARNING OUTCOME (CLO)

Upon completion of this course, students should be able to:

1. Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1)
2. Show the solution for differentiation and integration problem by using appropriate method. (C3,LD1)
3. Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)

Course	:	DBM3013 – Engineering Matematics 3
Credit	:	3
Pre requisite	:	DBM2013 – Engineering Matematics 2

SYNOPSIS

ENGINEERING MATHEMATICS 3 exposes students to the statistical and probability concepts and their applications in interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed Point Iteration and Newton-Raphson methods. In additional, the course also discusses optimization problems by using Linear Programming. In order to strengthen the students in solving advanced engineering problems, Ordinary Differential Equation (ODE) is also included.

COURSE LEARNING OUTCOME (CLO)

1. Solve the mathematical problem by using appropriate techniques and solution. (C3,LD1)
2. Show the solution for statistics and probability problems and linear programming by using appropriate mathematical methods. (C3, LD1)
3. Practice mathematical knowledge and skills in different mathematical problem. (C3,LD1)

Course	:	DBS1012 – Engineering Science
Credit	:	2
Pre requisite	:	None

SYNOPSIS

ENGINEERING SCIENCE is an applied science with theoretical concepts and practical learning sessions that can be applied in the engineering fields. This course focuses on the Physical Quantities, Measurement, Linear Motion, Force, Work, Energy, Power, Solid, Fluid, Temperature and Heat.

COURSE LEARNING OUTCOME (CLO)

1. Solve the basic engineering science problem by using related concept. (C3,LD1)
2. Organise an appropriate experiments to prove related physic principles. (P3,LD2)
3. Apply related physic principles in various situations to enhancec knowledge. (C3,LD1)

Course	:	DUA2012 – Sains Tek dan Kej dalam Islam
Credit	:	2
Pre requisite	:	None

SINOPSIS

SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaiannya dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya.

HASIL PEMBELAJARAN KURSUS (CLO)

1. Menghuraikan konsep Islam sebagai cara hidup. (C2,LD1 : P2,LD2)
2. Menjelaskan konsep sains, teknologi dan kejuruteraan dalam Islam. (C2,LD1)
3. Membincangkan prinsip syariah dan kaedah fiqh dalam sains, teknologi dan kejuruteraan. (C3,LD1 :A3,LD6)

Course	:	DUA6022 – Komunikasi dan Penyiaran Islam
Credit	:	2
Pre requisite	:	None

SINOPSIS

KOMUNIKASI DAN PENYIARAN ISLAM memfokuskan kepada penguasaan konsep, kemahiran komunikasi dan penyiaran Islam bagi meningkatkan kefahaman pelajar secara holistic terhadap kursus ini.

COURSE LEARNING OUTCOME (CLO)

1. Menjelaskan konsep, bentuk komunikasi dan hubungannya dalam Islam (C2,LD1)
2. Menunjukkan kemahiran pengurusan komunikasi dalam bidang penyiaran Islam. (C3, LD1 : A4,LD5)
3. Menghubung kait isu-isu semasa dalam komunikasi dan penyiaran Islam. (C3,LD1 : A3,LD6)

Course	:	DUB1012 - Pengajian Malaysia
Credit	:	2
Pre requisite	:	None

Sinopsis

PENGAJIAN MALAYSIA memupuk penghayatan ke arah melahirkan generasi yang cintakan negara. Kursus ini juga dapat mendidik kelompok masyarakat yang mempunyai daya juang yang tinggi dan mampu menghadapi cabaran di peringkat antarabangsa. Kursus ini memberi penghayatan tentang sejarah dan politik, perlembagaan Malaysia, kemasyarakatan dan perpaduan, pembangunan negara dan isu-isu keprihatinan negara. Objektif kursus ini adalah untuk melahirkan warganegara yang setia dan cintakan negara, berwawasan serta bangga menjadi rakyat Malaysia

Hasil Pembelajaran Kursus (CLO)

1. Menerangkan dengan baik sejarah bangsa dan negara (C2, LD1)
2. Menjelaskan Perlembagaan Malaysia dan system pemerintahan negara (C2, LD1)
3. Melaksanakan aktiviti berkaitan kenegaraan ke arah peningkatan patriotism pelajar (C3, LD1, A3, LD6)

Course	:	DUB2012 - Nilai Masyarakat Malaysia
Credit	:	2
Pre requisite	:	None

Sinopsis

NILAI MASYARAKAT MALAYSIA membincangkan aspek sejarah pembentukan masyarakat Malaysia, nilai-nilai agama serta adat resam dan budaya masyarakat majmuk. Selain itu, pelajar diberi kefahaman mengenai tanggungjawab individu dalam kehidupan dan cabaran-cabaran dalam membangunkan masyarakat Malaysia.

Hasil Pembelajaran Kursus (CLO)

1. Menerangkan sejarah pembentukan masyarakat dan nilai agama di Malaysia. (C2,LD1)
2. Menghubungkan kait tanggungjawab individu dalam kehidupan masyarakat dan negara. (C3,LD1 :A2,LD5)
3. Membincangkan cabaran-cabaran dalam membangunkan masyarakat Malaysia. (C3,LD1 :A3,LD6)

Course	:	DUE1012 – Communicative English 1
Credit	:	2
Pre requisite	:	None

SYNOPSIS

COMMUNICATIVE ENGLISH 1 focuses on developing students speaking skills to enable them to communicate effectively and confidently in group discussions and in a variety of social interactions. It is designed to provide students with appropriate reading skills to comprehend a variety of texts. It is also aimed to equip students with effective presentation skills.

COURSE LEARNING OUTCOME (CLO)

1. Apply appropriate language and communication skills in discussions and conversations. (C3, LD3)
2. Apply effective listening skills to demonstrate comprehension of audio recordings in a variety of situations. (C3, LD1)
3. Comprehend a variety of reading texts by applying effective reading skills. (C2, LD1)
4. Write in response to a stimulus using appropriate language. (C3, LD1)
5. Deliver an effective presentation using appropriate visual aids, verbal and non-verbal communication skills. (C3, A3, LD3)

Course	:	DUE3012 – Communicative English 2
Credit	:	2
Pre requisite	:	DUE1012 – Communicative English 1

SYNOPSIS

COMMUNICATIVE ENGLISH 2 emphasises the skills required at the workplace to describe products or services as well as processes or procedures. It also focuses on the skills to give and respond to instructions. This course will also enable students to make and reply to enquiries and complaints

COURSE LEARNING OUTCOME (CLO)

1. Describe products or services related to their field of studies using appropriate language. (C3,A3, LD3)
2. Transfer information of a process or procedure accurately from linear to non-linear form and vice versa. (C3, LD1)
3. Listen and respond to enquiries using appropriate language. (C3,LD1)
4. Make and respond to complaints using appropriate language. (C3,LD3)

Course	:	DUE5012 – Communicative English 3
Credit	:	2
Pre requisite	:	DUE3012 – Communicative English 2

SYNOPSIS

COMMUNICATIVE ENGLISH 3 aims to develop the necessary skills in students to analyse and interpret graphs and charts from data collected as well as job hunting mechanics. Students will learn the process of job hunting which includes job search strategies and making enquiries. They will also learn to write resumes and cover letters. The students will develop skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews.

COURSE LEARNING OUTCOME (CLO)

1. Describe and analyze information contained in graphs and charts clearly and accurately based on a mini project. (C4,LD1 : A3,LD3)
2. Write an effective resume and a supporting cover letter for a relevant job opening. (C3, LD1)
3. Handle a job interview effectively and confidently. (C3,LD3)

Course	:	DPB2012 – Entrepreneurship
Credit	:	2
Pre requisite	:	None

SYNOPSIS

ENTREPRENEURSHIP focuses the principles and concept of entrepreneurship. This course concentrates on the systematic methods of getting business ideas. This course also prepares students on conducting online business using social media marketing. It also emphasizes a preparation of business plan and developing their entrepreneurial skills.

COURSE LEARNING OUTCOME (CLO)

1. Explain clearly the concept of entrepreneurship and process of developing an effective business.(C2, LD1)
2. Prepare completely a business plan according to standard format. (P2,LD2)
3. Build the online business presence using the social media marketing. (P3,LD2: A4, LD7)

Course	:	DUW1012 - Occupational Safety and Health
Credit	:	2
Pre requisite	:	None

SYNOPSIS

OCCUPATIONAL SAFETY AND HEALTH course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of employers in implementing and complying with the safety procedures at work. This course provide an understanding of the key issues in OSH management, incident prevention, Emergency Preparedness and Response (EPR), fire safety, occupational first aid, Hazard Identification, Risk Assessment and Risk Control (HIRARC) and guide the students gradually into this multi-disciplinary science

COURSE LEARNING OUTCOME (CLO)

1. Identify the OSH legislation and its compliance in Malaysia. (C2, LD1)
2. Explain briefly incident hazards, risks and safe work practices in order to maintain health and safe work environment. (C2, LD1)
3. Discuss cooperatively in responding to an accident action at workplace. (C3, LD1 : A2, LD4)
4. Adhere to the safety procedures in respective fields. (A3,LD8)

Course	:	DRB1060 – Pengakap Kelana
Credit	:	1
Pre requisite	:	None

SINOPSIS

PENGAKAP KELANA memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

HASIL PEMBELAJARAN (CLO)

1. Menunjukkan kemahiran khusus yang dipelajari (P2, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A2, LD4, LD9)

Course	:	DRB2061 – Pengakap Kelana 1
Credit	:	1
Pre requisite	:	DRB1060 – Pengakap Kelana

SINOPSIS

PENGAKAP KELANA 1 memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

HASIL PEMBELAJARAN (CLO)

1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P2, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A2, LD4, LD9)

Course	:	DRB3061 – Pengakap Kelana 2
Credit	:	2
Pre requisite	:	DRB2060 – Pengakap Kelana 1

SINOPSIS

PENGAKAP KELANA 2 memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

HASIL PEMBELAJARAN (CLO)

1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P3, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A3, LD4, LD9)

Course	:	DRS2131 - Memanah
Credit	:	1
Pre requisite	:	None

SINOPSIS

MEMANAH memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

HASIL PEMBELAJARAN (CLO)

1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P2, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A2, LD4, LD9)

Course	:	DRK3052 - Fotografi
Credit	:	2
Pre requisite	:	None

SINOPSIS

FOTOGRAFI memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

HASIL PEMBELAJARAN (CLO)

1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P3, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A3, LD4, LD9)



EXAMINATION REGULATIONS
(Must be read in conjunction with the book “Exam Instructions and Assessment Methods December 5, 2015”)

4.1 Grading system

Mark	Pointer	Gred	Status
90-100	4.00	A+	Very Excellence
80-89	4.00	A	Excellence
75-79	3.67	A-	Honors
70-74	3.33	B+	Honors
65-69	3.00	B	Honors
60-64	2.67	B-	Pass
55-59	2.33	C+	Pass
50-54	2.00	C	Pass
47-49	1.67	C-	Pass
44-46	1.33	D+	Pass
40-43	1.00	D	Pass
30-39	0.67	E	Fail
20-29	0.33	E-	Fail
0-19	0.00	F	Fail

4.2 General Regulations Examination Methods

Students must meet the following requirements before qualifying for their academic performance:

- i. Enrolled / register the academic subject
- ii. Manage to fulfill all requirement in registration subject
- iii. The attendance of the lecture reaches 80% as set for a course

4.3 Course Registration Regulations

- i. Course registration will be conducted at the beginning of the semester within the period of at least SEVEN days from the official date of study.
- ii. Students should get an advice from Academic Advisor before registering
- iii. The amount of credit that a student needs to take for each semester is between 12 to 20 credit hours or as specified in the Curriculum and Program Structure Document.
- iv. Transfer credit and course exclusions can be applied within THREE weeks first semester of the lecture
- v. ADDING & REMOVING COURSES can be made within the 3rd to 6th week of study. Students should seek the advice and endorsement of the Academic Advisor and obtain the approval of the Head of Department.

4.4 Repeat of Courses

- i. Students must register a failed course in the previous semester before registering other courses for the current semester.
- ii. For final semester students failing TWO courses or more are required to repeat the failed course in the current semester.
- iii. For students graduating courses with grades C-, D + and D are allowed to repeat the subject only once during their study. The calculated results are from the best grade.

4.5 Qualification Requirements for attending Final Examination

- i. Has registered the course
- ii. Have attended 80% or more lectures / tutorials / practices for a predetermined period.

Percentage of attendance is calculated as follows;

$$\% \text{ attendance} = \frac{\text{Actual attendance (hour)}}{\text{Recommended attendance (hour)}} \times 100\%$$

- iii. Students who attend less than 80% are not eligible to sit for the final examination. Students will be given F grade for the course. This method also applies to course assessed by course work only.

4.6 Period of Study

- i. Duration of study for a full time program is

Minimum - FIVE Semesters
Maximum - NINE Semesters

- ii. Students who are disciplined (suspended under 174) is included in the calculation of the duration of study.
- iii. Students who do not register for a course without any reasonable reason, the semester are considered as the duration of study.
- iv. Any postponement of studies approved by the Director shall not be considered as the duration of the study.



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