

STUDENT STUDY GUIDE

DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)



$e = a + c + g$ $a + c + g = a + c + g$

collabration employability academic
generic skill collabration employabilit
academic generic skill academic collab
employability academic generic skill



TABLE ON CONTENTS

1. <i>Vision and mission JPPKK and PBS</i>	3
2. <i>Outcome Based Education</i>	4
3. <i>Program Overview</i>	6
• <i>Programme Aim</i>	6
• <i>PEO</i>	6
• <i>Job Prospect</i>	7
• <i>PLO</i>	8
• <i>Programme Structure</i>	11
• <i>Matrix PEO vs PLO</i>	14
4. <i>Synopsis And Course Learning Outcome</i>	15
5. <i>Credit Transfer & Exemption (CTCE)</i>	28

1. VISSION AND MISSION JPPKK & PBS

POLYTECHNIC VISION

*To be the
Leading-Edge TVET Institution.*

POLYTECHNIC MISSION

- *To provide wide access to quality and recognized TVET programmes.*
- *To empower communities through lifelong learning.*
- *To develop holistic, entrepreneurial and balanced graduates.*
- *To capitalise on smart partnership with stakeholders.*

EDUCATION GOAL

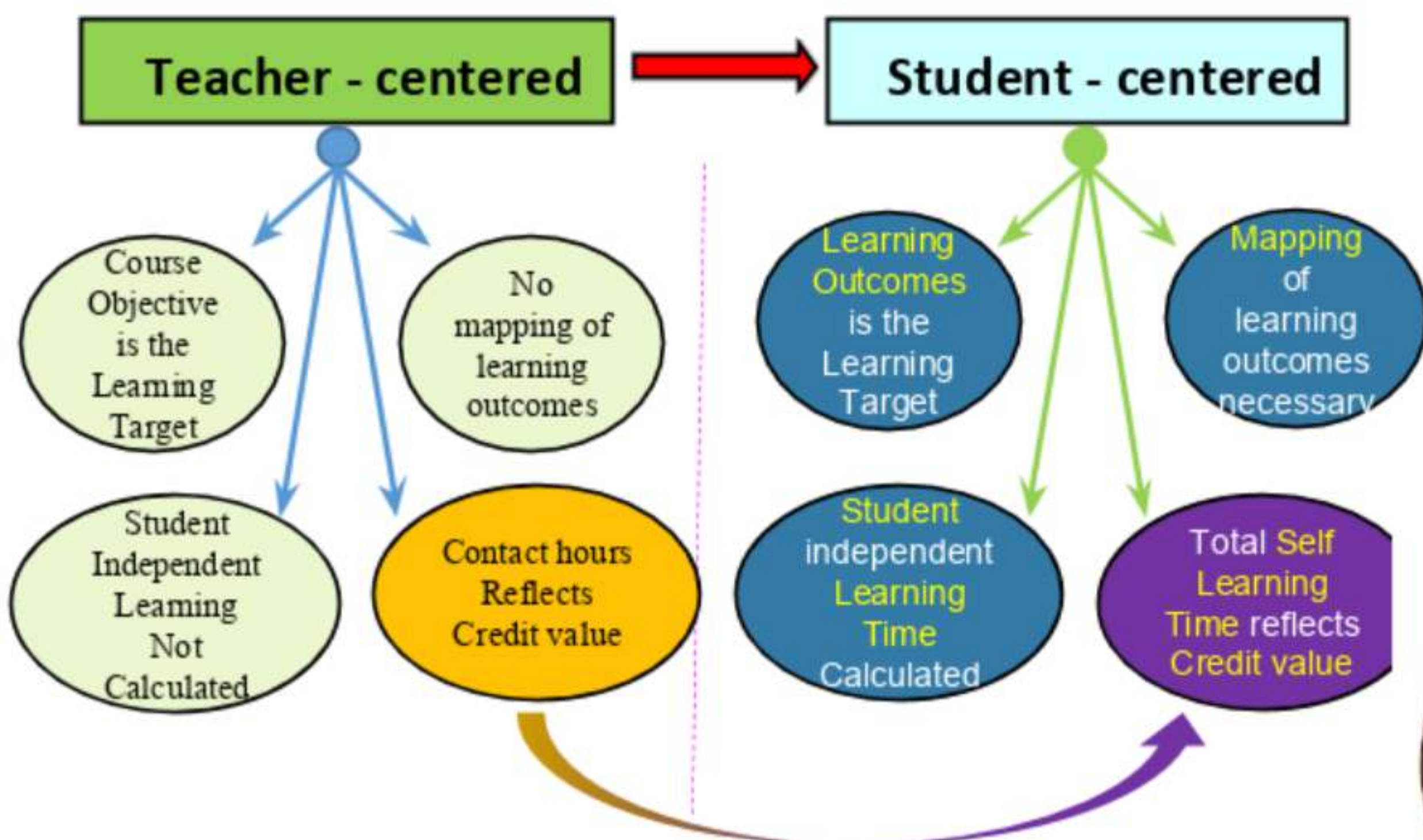
To produce holistic and competent TVET graduates capable of contributing to the nation development.

2. OUTCOME BASED EDUCATION (OBE)

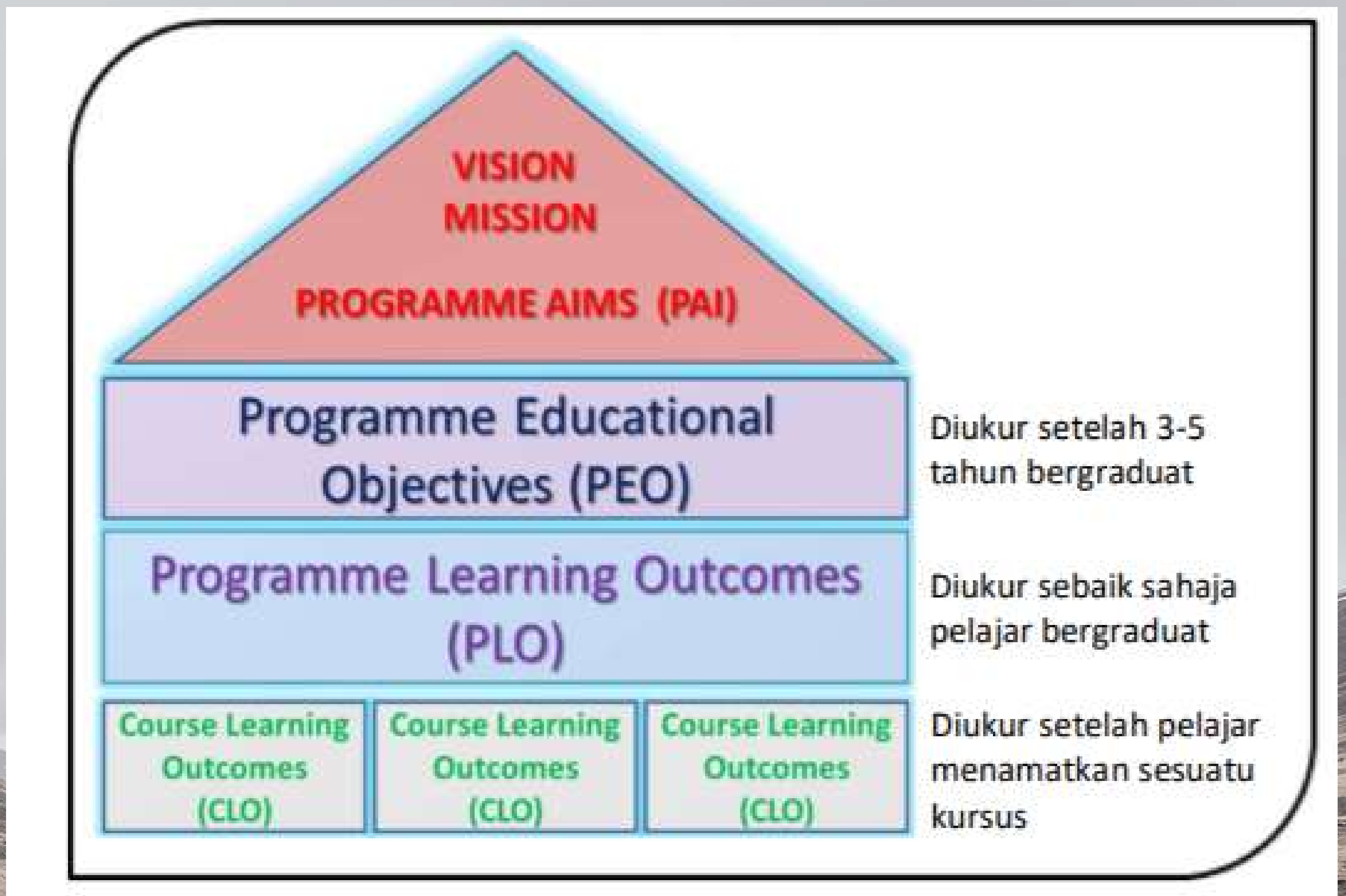
Outcome-based education (OBE) is an educational model for students to demonstrate their knowledge and able to perform according to the required outcomes.

OBE is an approach that focuses on outcomes such as achievements of students that are measurable, proven and can be improved.

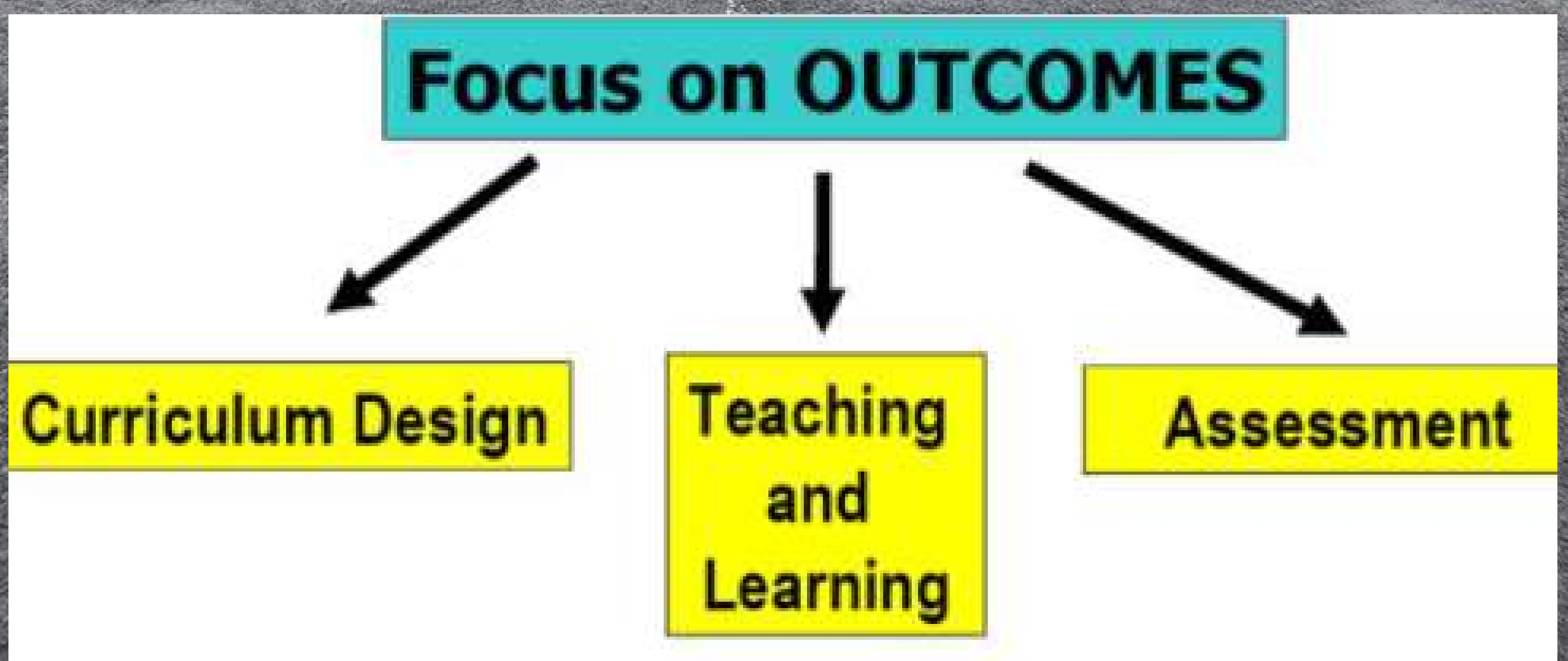
The students achievements of the outcomes are measured during the course of the study and after the students have graduated and during work in industry.



OBE model of outcome hierarchy



OBE philosophy



3. PROGRAMME OVERVIEW

PROGRAMME AIM

The programme believes that every individual has potential and the programme aims to develop adaptable and responsible Senior Assistant Mechanical Engineers to support government's aspiration to increase workforce in engineering related field.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Mechanical Engineerin (Manufacturing) programme should produce Assistant Mechanical Engineers who are:

PEO 1: equipped with industry-relevant knowledge and skills in Mechanical Engineering field.

PEO 2: engaging on lifelong and continuous learning to enhance knowledge and skills.

PEO 3: instilled with entrepreneurial skills and mind set in the real working environment.

PEO 4: established with strong linkage with society and players in the industry.

Job Prospect

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

- a. Assistant Engineer
- b. Production/ Process Supervisor
- c. Technical Assistant
- d. Technician
- e. Product Designer
- f. Quality Officer
- g. CNC Programmer Technical Assistant
- h. Precision Machinist
- i. Production / Process Executive
- j. Procurement Executive
- k. Technical Specialist
- l. Technical Instructor or Lecturer
- m. Entrepreneur

PROGRAMME LEARNING OUTCOMES (PLO)

*Upon completion
of the programme, students should be able to:*

PLO1: apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialisation as specified in DK1 to DK4 respectively for practical procedures and practices

PLO2: identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)

PLO3: design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (DK5)

PLO4: conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements

PLO5: apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations (DK6)

PLO6: demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems (DK7)

PLO7: understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)

PLO8: understand and commit to professional ethics and responsibilities and norms of technician practice

PLO9: function effectively as an individual, and as a member in diverse technical teams

PLO10: communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions

PLO11: demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments

PLO12: recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge

Notes:

DK 1 : A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline

DK 2 :
Procedural mathematics, numerical analysis, statistics applicable in a sub-discipline.

DK 3 : A coherent procedural formulation of engineering fundamental required in an accepted sub-discipline

DK 4 : Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline

DK 5 : Knowledge that supports engineering design based on the techniques and procedures of a practice area

DK 6 : Codified practical engineering knowledge in recognised practice area.

DK 7 : Knowledge of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts

PROGRAMME STRUCTURE

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES
			L	P	T	O	
SEMESTER 1							
Compulsory	DUE10012	Communication English 1	1	0	2	0	2
	MPU24XX1	Sukan	0	2	0	0	1
Unit Beruniform 1							
Common Core	DUW10022	Occupational, Safety and Health for Engineering	2	0	0	0	2
	DBS10012	Engineering Science	2	1	0	0	2
	DBM10013	Engineering Mathematics 1	2	0	2	0	3
Discipline Core	DJJ10013	Engineering Drawing	1	3	0	0	3
	DJJ10022	Mechanical Workshop Practice 1	0	4	0	0	2
	DJJ10033	Workshop Technology	3	0	0	0	3
TOTAL			25				18
SEMESTER 2							
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	1	0	2	0	2
	MPU23042	Nilai Masyarakat Malaysia**					
	MPU24XX1	Kelab/ Persatuan	0	2	0	0	1
Unit Beruniform 2							
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	0	3
Discipline Core	DJJ20053	Electrical Technology	2	2	0	0	3
	DJJ20063	Thermodynamics	2	2	0	0	3
	DJJ20073	Fluid Mechanics	2	2	0	0	3
Specialization	DJF21012	Manufacturing Workshop Practice 1	0	4	0	0	2
TOTAL			25				17
SEMESTER 3							
Compulsory	DUE30022	Communication English 2	1	0	2	0	2
	MPU21032	Penghayatan Etika dan Peradaban	1	0	2	0	2
Common Core	DBM30033	Engineering Mathematics 3	2	0	2	0	3
Discipline Core	DJJ30113	Material Science and Engineering	2	2	0	0	3
	DJJ30093	Engineering Mechanics	2	2	0	0	3
	DJJ30122	Computer Aided Design	1	2	0	0	2
Specialization	DJF31022	Manufacturing Workshop Practice 2	0	4	0	0	2
TOTAL			25				17



SEMESTER 4							
Common core	DJJ40132	Engineering and Society	2	0	0	0	2
Discipline Core	DJJ40153	Pneumatic and Hydraulics	2	2	0	0	3
	DJJ30103	Strength of Materials	2	2	0	0	3
	DJJ40182	Project 1	2	0	0	0	2
Specialization	DJF41032	Manufacturing Workshop Practice 3	0	4	0	0	2
	DJF41042	CAD/CAM	0	4	0	0	2
	DJF41052	Manufacturing System	2	0	0	0	2
Elective		Elective***					
TOTAL			22				16
SEMESTER 5							
Compulsory	DUE50022	Communication English 3	1	0	2	0	2
	MPU22012	Entrepreneurship	1	0	2	0	2
Discipline Core	DJJ50193	Project 2	0	4	0	0	3
Specialization	DJF51062	Manufacturing Control	2	0	0	0	2
	DJF51072	Jig and Fixtures Design	1	2	0	0	2
	DJF51082	Quality Control	2	0	0	0	2
	DJF51092	Tool Design	1	2	0	0	2
Elective		Elective***					
TOTAL			20				15
SEMESTER 6							
Industrial Training	DUT600610	Industrial Training at Training	0	0	0	0	10
TOTAL			0				10
TOTAL CREDIT VALUES							95
ELECTIVES COURSES							
1	DJF42012	Manufacturing Process	2	0	0	0	2
2	DJF52032	Manufacturing Economy	2	0	0	0	
3	DJJ42032	Instrumentation And Control	2	0	0	0	
4	DJJ42022	Industrial Management	2	0	0	0	
5	DJJ52052	Railway Track System	2	0	0	0	
6	DJM20032	C Programming	1	2	0	0	
7	DJM40082	Programmable Logic Control	1	2	0	0	
8	DJM40092	Control System	2	2	0	0	
FREE ELECTIVES ^a							
1	DUD10012	Design Thinking	1	0	0	1	2

Legend:

L : Lecture, **P** : Practical / Lab, **T** : Tutorial, **O** : Others

(The numbers indicated under L, P, T & O represent the contact hours per week, to be used as a guide for time table preparation).

*For Muslim Students

**For Non Muslim Students

***Only one (1) elective course can be chosen either in semester 4 or 5

Course Classification	Total Credit	%
i. (a) Compulsory	14	15
(b) Compulsory (Bahasa Kebangsaan A) ^b	2 ^b	0
ii. Common Core	15	16
iii. Discipline Core	36	38
iv Specialization	18	19
Total Credit	83	88
v. (a) Elective	2	2
(b) Free Electives ^a	2 ^a	0
vi. Industrial Training	10	10
Grand Total Credit	95	100
	Total Hours	%
i. Lecture	49	41
ii. Practical	52	44
iii. Tutorial	18	15
Total Contact Hours	119	100



MATRIX OF PROGRAMME LEARNING OUTCOME (PLO) VS PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PROGRAMME LEARNING OUTCOMES (PLO)		PROGRAMME EDUCATIONAL OBJECTIVES (PEO)			
		PEO 1	PEO 2	PEO 3	PEO 4
PLO 1	Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices	/			
PLO 2	Identify and analyze well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)	/			
PLO 3	Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (DK5)	/			
PLO 4	Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements	/			
PLO 5	Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations (DK6)	/			
PLO 6	Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems (DK7)				/
PLO 7	Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)				/
PLO 8	Understand and commit to professional ethics and responsibilities and norms of technician practice				/
PLO 9	Function effectively as an individual, and as a member in diverse technical teams				/
PLO 10	Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions				/
PLO 11	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments			/	
PLO 12	Recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge		/		

4. SINOPSIS AND COURSE LEARNING OUTCOME (CLO)

SEMESTER 1

NAME OF COURSE	ENGINEERING MATHEMATICS 1
CODE COURSE	DBM10013
CREDIT VALUE	3
PREREQUISITE	NONE
<p>SYNOPSIS: ENGINEERING MATHEMATICS 1 exposes students to the basic algebra including resolve partial fractions. This course also covers the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formulae. Students will be introduced to the theory of complex number and concept of vector and scalar. Students will explore advanced matrices involving 3x3 matrix.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Use mathematical statement to describe relationship between various physical phenomena. (C3) 2. Show mathematical solutions using the appropriate techniques in mathematics. (C3) 3. Use mathematical expression in describing real engineering problems precisely, concisely and logically. (A3) 	
NAME OF COURSE	ENGINEERING SCIENCE
CODE COURSE	DBS10012
CREDIT VALUE	2
PREREQUISITE	NONE
<p>SYNOPSIS: ENGINEERING SCIENCE course introduces the physical concepts required in engineering disciplines. Students will learn the knowledge of fundamental physics in order to identify and solve engineering physics problems. Students will be able to perform experiments and activities to mastery physics concepts.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Use basic physics concept to solve engineering physics problems (C3) 2. Apply knowledge of fundamental physics in activities to mastery physics concept (C3) 3. Perform appropriate activities related to physics concept (P3) 	
NAME OF COURSE	COMMUNICATIVE ENGLISH 1
CODE COURSE	DUE10012
CREDIT VALUE	2
PREREQUISITE	NONE
<p>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. The students are equipped with effective presentation skills as a preparation for academic and work purposes.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Participate in a discussion using effective communication and social skills to reach an amicable conclusion by accommodating differing views and opinions(A3) 2. Demonstrate awareness of values and opinions embedded in texts on current issues(A3) 3. Present a topic of interest that carries identifiable values coherently using effective verbal and nonverbal communication skills(A2) 	

NAME OF COURSE	ENGINEERING DRAWING
CODE COURSE	DJJ 10013
CREDIT VALUE	3
PREREQUISITE	NONE

SYNOPSIS: ENGINEERING DRAWING course provides the students with the fundamentals of technical drawings and the application Computer Aided Design (CAD) software. For technical drawing, it emphasizes on the practical knowledge of drawing instruments and drawing techniques while for CAD the student will learn to navigate and use the software to create 2D drawing design in engineering. Students shall be able to demonstrate competency in using some standard available features of technical drawing and CAD application to create and manipulate objects or elements in engineering drawing.

COURSE LEARNING OUTCOMES (CLO):

- 1. Produce technical drawing and features of CAD software in producing engineering drawing. (C3, PLO1)
- 2. Create 2D CAD drawing according to the engineering drawing standards. (P3, PLO5)
- 3. Apply following engineering norms and practices in engineering drawing. (A3, PLO8)

NAME OF COURSE	MECHANICAL WORKSHOP PRACTICE 1
CODE COURSE	DJJ 10022
CREDIT VALUE	2
PREREQUISITE	NONE

SYNOPSIS: MECHANICAL WORKSHOP PRACTICE 1 exposes the students to welding, machining and fitting which involve the use of arc and gas welding machine, lathe machine, drilling machine, grinding, hand tools, marking out tools, measuring and testing tools. Students are also taught to emphasize on safety procedures and cleanliness in the workshop.

COURSE LEARNING OUTCOMES (CLO):

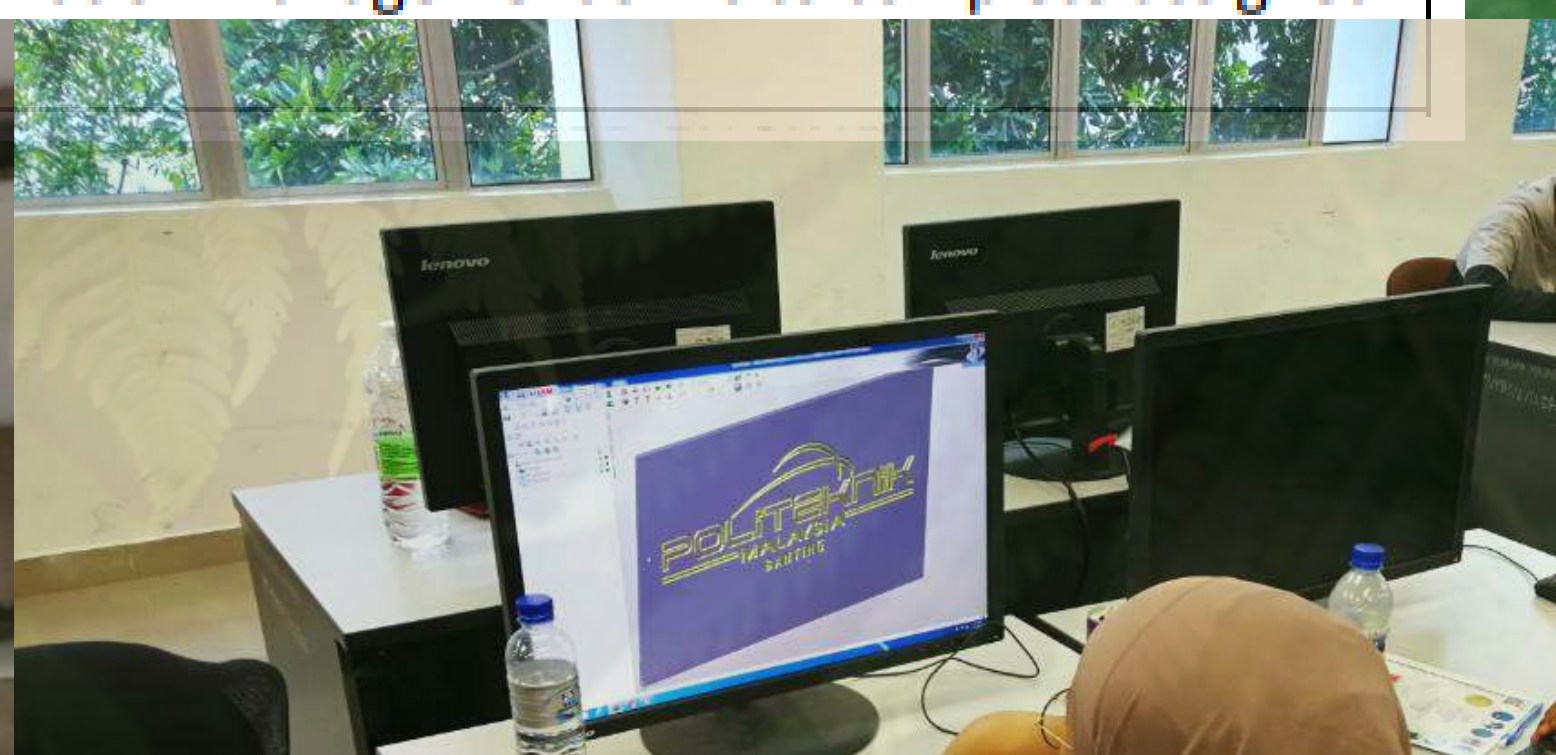
1. Measure finished product using appropriate measurement instruments (P3, PLO5)
2. Perform fitting, welding and machining works according to Standard Operational Procedure (SOP). (P4, PLO5)
3. Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation. (A3, PLO6)

NAME OF COURSE	WORKSHOP TECHNOLOGY
CODE COURSE	DJJ 10033
CREDIT VALUE	3
PREREQUISITE	NONE

SYNOPSIS: WORKSHOP TECHNOLOGY provides exposure and knowledge in using hand tools, machine operation such as drilling, lathe, milling and computer numerical control. It also covers on gear measurement and inspection welding process in oxy acetylene, Shielded Metal Arc Welding (SMAW), Gas Tungsten Arc Welding (GTAW) and Gas Metal Arc Welding (GMAW).

COURSE LEARNING OUTCOMES (CLO):

1. Apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology (C3, PLO1)
2. Apply standard practice in operating mechanical tools and component (C3, PLO8)
3. Demonstrate continuous learning and information management skills to complete assigned task (A3, PLO1)



NAME OF COURSE	OCCUPATIONAL SAFETY AND HEALTH FOR ENGINEERING
CODE COURSE	DUW10022
CREDIT VALUE	2
PREREQUISITE	NONE

SYNOPSIS: OCCUPATIONAL SAFETY AND HEALTH FOR ENGINEERING 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 workers in

implementing and complying with the safety procedures at work. Understanding of notifications of accidents, dangerous occurrence, poisoning and diseases and liability for offences will be imparted upon students. This course will also provide an understanding of the key issues in OSH management, incident prevention, Emergency Preparedness and Response (EPR), fire safety, Hazard Identification, Risk Control and Risk Assessment (HIRARC) and guide the students gradually into this multi-disciplinary science.

- COURSE LEARNING OUTCOMES (CLO):**
1. Explain briefly Occupational Safety and Health (OSH) procedures, regulation and its compliance in Malaysia. (C2, PLO1)
 2. Initiates incident hazards, risks and safe work practices in order to maintain health and safe work environment. (A3, PLO8)
 3. Forms communication skills in a team to respond for an accident action at workplace. (A3, PLO10)

SEMESTER 2

NAME OF COURSE	ENGINEERING MATHEMATICS 2
CODE COURSE	DBM20023
CREDIT VALUE	3
PREREQUISITE	ENGINEERING MATHEMATICS 2

SYNOPSIS: ENGINEERING MATHEMATICS 2 exposes students to the basic laws of indices and logarithms. This course introduces the basic rules of differentiation concepts to solve problems that relates maximum, minimum and calculate the rates of changes. This course discusses integration concepts in order to strengthen student's knowledge for solving area and volume bounded region problems. In addition, students will learn application of both techniques of differentiation and integration

- COURSE LEARNING OUTCOMES (CLO):**
1. Use algebra and calculus knowledge to describe relationship between various physical phenomena. (C3)
 2. Solve the mathematical problems by using appropriate and relevant fundamental calculus techniques. (C3)
 3. Use mathematical language to express mathematical ideas and arguments precisely, concisely and logically in calculus. (A3)

NAME OF COURSE	NILAI MASYARAKAT MALAYSIA
CODE COURSE	MPU23042
CREDIT VALUE	2
PREREQUISITE	TIADA

SINOPSIS: NILAI MASYARAKAT MALAYSIA membincangkan aspek sejarah pembentukan masyarakat, nilai-nilai agama, adat resam dan budaya masyarakat di Malaysia. Selain itu, pelajar dapat mempelajari tanggungjawab sebagai individu dan nilai perpaduan dalam kehidupan di samping cabaran- cabaran dalam membentuk masyarakat Malaysia

- HASIL PEMBELAJARAN KURSUS (CLO):**
1. Membincangkan sejarah dan nilai dalam pembentukan masyarakat di Malaysia (A2)
 2. Menerangkan etika dan profesionalisme terhadap konsep perpaduan bagi meningkatkan semangat patriotisme masyarakat Malaysia (A3)
 3. Menghubungkan minda ingin tahu dengan cabarancabaran dalam membentuk masyarakat Malaysia (A4)

CODE COURSE	MPU23052
CREDIT VALUE	2
PREREQUISITE	TIADA
<p>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</p>	
<p>HASIL PEMBELAJARAN KURSUS (CLO): Melaksanakan dengan yakin amalan Islam dalam kehidupan seharian (A2) Menerangkan etika dan profesionalisme berkaitan sains teknologi dan kejuruteraan dalam Islam (A3) Menghubunkait minda ingin tahu) dengan prinsip syariah, etika dan kaedah fiqh dalam bidang sains, teknologi dan kejuruteraan menurut perspektif Islam (A4)</p>	
NAME OF COURSE	ELECTRICAL TECHNOLOGY
CODE COURSE	DJJ 20053
CREDIT VALUE	3
PREREQUISITE	NONE
<p>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 Engineering.</p>	
<p>COURSE LEARNING OUTCOMES (CLO) Explain the principles and fundamental of electrical circuits, electromagnetism, transformers and electrical machine (C2, PLO1) Solve the problem related to electrical circuits, electromagnetism, transformers and electrical machine (C3, PLO1) Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO5)</p>	
NAME OF COURSE	THERMODYNAMICS
CODE COURSE	DJJ 20063
CREDIT VALUE	3
PREREQUISITE	NONE
<p>SYNOPSIS: THERMODYNAMICS provides knowledge of theory, concept and application of principles to solve problems related to thermodynamics. It emphasizes on concept of non-flow process and flow process, properties of steam, Carnot cycle and Rankine cycle. This course also exposes the students to the demonstration of experiments in Thermodynamics by using the real equipment.</p>	
<p>COURSE LEARNING OUTCOMES (CLO): 1. Explain fundamentals concept and properties of pure substances in thermodynamics (C2, PLO1) 2. Apply Laws of thermodynamics and it processes (C3, PLO1) 3. Organize appropriately experiments according to the Standard Operating Procedures (P4, PLO5)</p>	
NAME OF COURSE	FLUID MECHANICS
CODE COURSE	DJJ 20073
CREDIT VALUE	3
PREREQUISITE	NONE
<p>SYNOPSIS: FLUID MECHANICS provides students with a strong understanding of the fundamentals of fluid mechanics principles related to the fluid properties and behavior in static and dynamic situations. This course also exposes the students to the demonstration at the real equipment of fluid mechanics.</p>	
<p>COURSE LEARNING OUTCOMES (CLO): 1. Explain the fundamentals of fluid (C2, PLO1) 2. Solve problems related to fluid properties, fluid statics and fluid dynamics (C3, PLO1) 3. Organize appropriate experiments in groups according to the standard operating procedures (P4, PLO5)</p>	

NAME OF COURSE	MANUFACTURING WORKSHOP PRACTICE 1
CODE COURSE	DJF21012
CREDIT VALUE	2
PREREQUISITE	TIADA
<p>SYNOPSIS MANUFACTURING WORKSHOP PRACTICE 1 exposes the students to the fundamental of manufacturing processes, industrial environment, cultural issues and hands on experiences. This course enables students to apply knowledge and develop required technical skills on sand casting, conventional machining and TIG/MIG welding. The workshop practice helps the students to practice appropriate safety procedures and standard operation on completing mini project and practical task. The practical skills also cover the organizational and housekeeping activity, schedule maintenance, planning skills, supervising design, inspecting and testing welding task in order to meet the quality requirement</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Build a project using casting, TIG and MIG welding process based on standard operational procedures and safety. (P3, PLO5) 2. Perform direct indexing operation using indexing head attachment in milling machine processes. (P4, PLO5) 3. Demonstrate an understanding of the responsibilities, societal, health, safety, legal and cultural issues during practical work session. (A3, PLO6) 	

SEMESTER 3

NAME OF COURSE	ENGINEERING MATHEMATICS 3
CODE COURSE	DBM30033
CREDIT VALUE	3
PREREQUISITE	ENGINEERING MATHEMATICS 2
<p>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 order to strengthen the students in solving engineering problems, Ordinary Differential Equation (ODE) is also included. In additional, the course also discusses optimization problems by using Linear Programming. It is designed to build students' teamwork and problems solving skill</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Demonstrate an understanding of the common body of knowledge in mathematics. (C3) 2. Demonstrate problems solving skills in engineering problems. (C3) 3. Use mathematical expression in describing real engineering problems precisely, concisely and logically. (A3) 	
NAME OF COURSE	COMMUNICATIVE ENGLISH 2
CODE COURSE	DUE30022
CREDIT VALUE	2
PREREQUISITE	COMMUNICATIVE ENGLISH 1
<p>SYNOPSIS: COMMUNICATIVE ENGLISH 2 emphasises the skills required at the workplace to describe products or services as well as processes or procedures. This course will also enable students to make and reply to enquiries and complaints</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Describe a product or service effectively by highlighting its features and characteristics that appeal to a specific audience (A3) 2. Describe processes, procedures and instructions clearly by highlighting information of concern (A3) 3. Demonstrate effective communication and social skills in handling enquiries and complaints amicably and professionally (A3) 	

NAME OF COURSE CODE COURSE CREDIT VALUE PREREQUISITE	PENGHAYATAN ETIKA DAN PERADABAN MPU21032 2 TIADA
<p>2 SINOPSIS: PENGHAYATAN ETIKA DAN PERADABAN ini menjelaskan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenal pasti sistem, tahap perkembangan, kemajuan dan kebudayaan merentas bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan dan perbahasan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan profesional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini.</p>	
<p>HASIL PEMBELAJARAN KURSUS (CLO):</p> <ol style="list-style-type: none"> 1. Membentangkan konsep etika dan peradaban dalam kepelbagaian tamadun. (A2) 2. Menerangkan sistem, tahap perkembangan, kesepaduan sosial dan kebudayaan merentas bangsa di Malaysia. (A2) 3. Mencadangkan sikap yang positif terhadap isu dan cabaran kontemporari dari perspektif etika dan peradaban. (A3) 	
NAME OF COURSE CODE COURSE CREDIT VALUE PREREQUISITE	ENGINEERING MECHANICS DJJ 30093 3 NONE
<p>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.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Solve problems related to static and dynamics based on the concepts and principle of engineering mechanics (C3, PLO1) 2. Analyze engineering related problems based on fundamentals of static and dynamics (C4,PLO2) 3. Organize appropriately experiment in groups according to Standard Operation Procedures (P4, PLO5) 	
NAME OF COURSE CODE COURSE CREDIT VALUE PREREQUISITE	MATERIAL SCIENCE AND ENGINEERING DJJ 30113 3 NONE
<p>SYNOPSIS: MATERIALS SCIENCE AND ENGINEERING course introduces students a comprehensive coverage of basic fundamentals of materials science and engineering. The course focuses on material structures, properties, fabrication methods, corrosion, thermal processing and material testing mostly of metals and alloys. New fabrication method of powder metallurgy are introduces to student to cater the fabrications of devices, sensors for Industry 4.0 technology.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Apply the fundamental of material science to identify the materials, properties, behavior, processes and treatment. (C3 ,PLO1) 2. Performed appropriate material testing according to the Standard Operating Procedures. (P4 , PLO5) 3. Demonstrate the ability to work individually and in groups to complete assigned tasks during the practical work session. (A3 ,PLO9) 	

NAME OF COURSE	COMPUTER AIDED DESIGN
CODE COURSE	DJJ 30122
CREDIT VALUE	2
PREREQUISITE	ENGINEERING DRAWING
<p>SYNOPSIS: COMPUTER AIDED DESIGN exposes the students to the fundamentals and principles of 3D drawing using 3D CAD software. Students also equip with various method of creating a solid model using extrude, revolve, swept, assembly, simulation and animation. Hands-on exercises drawing of mechanical engineering will also be covered in this course</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Apply CAD commands in order to produce engineering drawing. (C3, PLO1) 2. Construct 3D drawing of Mechanical Components according Drawing Standards. (P4, PLO5) 3. Demonstrate a presentation with following technical standard Communication. (A3, PLO10) 	

NAME OF COURSE	MANUFACTURING WORKSHOP PRACTICE 2
CODE COURSE	DJF31022
CREDIT VALUE	2
PREREQUISITE	MANUFACTURING WORKSHOP PRACTICE 1
<p>SYNOPSIS: MANUFACTURING WORKSHOP PRACTICE 2 exposes the students to the fundamental of manufacturing processes, industrial environment, cultural issues and hands-on experiences. This course enables students to apply knowledge and develop required technical skills on CNC machine, conventional machining, surface grinding machine and TIG and MIG welding. The workshop practice helps the students to practice appropriate safety procedures and standard operation on completing mini project and practical task. The practical skills also cover the organizational and housekeeping activity, schedule maintenance, planning skills, supervising design, inspecting and testing welding task in order to meet the quality requirements.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Build a project using CNC machine, TIG and MIG welding process based on standard operational procedures and safety. (P3, PLO5) 2. Perform contouring cutting operation using rotary table attachment in milling machine processes. (P4, PLO5) 3. Demonstrate an understanding of the responsibilities, societal, health, safety, legal and cultural issues during practical work session. (A3, PLO6) 	



SEMESTER 4

NAME OF COURSE CODE COURSE CREDIT VALUE PREREQUISITE	ENGINEERING AND SOCIETY DJJ 40132 2 NONE
SYNOPSIS: ENGINEERING AND SOCIETY focuses on the introduction to professional ethics, theory and philosophy of ethics, values in professional ethics, engineering bylaws and standards, issues in professional ethics and sustainability. It also relates towards IR 4.0 introduction and green engineering.	
COURSE LEARNING OUTCOMES (CLO): 1. Determine the important of work ethics, bylaws and professionalism in engineering profession. (C4,PLO8) 2. Determine the needs for sustainable and green engineering towards providing the solutions in engineering field. (C4,PLO7) 3. Implement the roles of engineering profession towards the developing of society and its challenges in globalization (C3,PLO6)	
NAME OF COURSE CODE COURSE CREDIT VALUE PREREQUISITE	STRENGTH OF MATERIALS DJJ 30103 3 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): 1. Apply the concepts of strength of materials to solve related problems. (C3, PLO1) 2. Analyze problems correctly related to strength of materials (C4, PLO2) 3. Organize appropriately experiment in groups according to Standard Operation Procedures (SOP). (P4, PLO5)	
NAME OF COURSE CODE COURSE CREDIT VALUE PREREQUISITE	PNEUMATIC & HYDRAULICS COURSE DJJ 40153 3 NONE
SYNOPSIS: PNEUMATIC & 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): 1. Apply the basic concept and function of pneumatics and hydraulics system. (C3 , PLO1) 2. Design pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks.(C5 , PLO3) 3. Perform experiment on pneumatic, electro-pneumatic and hydraulic circuit during practical session. (P4 , PLO5)	

NAME OF COURSE	PROJECT 1
CODE COURSE	DJJ 40182
CREDIT VALUE	2
PREREQUISITE	NONE
SYNOPSIS: PROJECT 1 provides students with solid foundation on knowledge and skills in formulating project proposal preparation, writing and presentation	
COURSE LEARNING OUTCOMES (CLO): Engineering problems to be solved (C4, PLO2) Skills to solve problems (C4, PLO7) Application to problems (A3, PLO11)	
NAME OF COURSE	MANUFACTURING WORKSHOP PRACTICE 3
CODE COURSE	DJF41032
CREDIT VALUE	2
PREREQUISITE	MANUFACTURING WORKSHOP PRACTICE 2
SYNOPSIS : MANUFACTURING WORKSHOP PRACTICE 3 exposes the students to develop knowledge and skills in Robot Programming and Application, Programmable Logic Control, Additive Manufacturing and Plastic Processing. Robot Application helps the students to learn about programming, hands-on training and robot application. Students will also learn about creating a simple program using PLC which is widely used in manufacturing and mechanical processes. The Additive Manufacturing will focus on designing complex design shapes which involves in modifying and completing design of a prototype. Plastic processing process helps the students to understand the basic principle of the plastic manufacturing processes.	
COURSE LEARNING OUTCOMES (CLO) : 1. Manipulates robot programming and PLC programming process. (P3, PLO5) 2. Perform mini project using additive manufacturing and plastic processing process. (P4, PLO5) 3. Demonstrate an understanding of professional ethics, responsibilities, norms and practices during practical work session. (A3, PLO8)	
NAME OF COURSE	CAD/CAM
CODE COURSE	DJF41042
CREDIT VALUE	2
PREREQUISITE	NONE
SYNOPSIS: CAD/CAM explains the theory and basic of coding languages, structures and the use of CAD/CAM systems for generating and verifying tool path. The students will be use CAD/CAM software to demonstrate the integration between CAD and CAM operation that includes design an object, produce a code and simulate the tool path for machining operation prior to the machining process and also generate NC part programming. Students also enables to build a project from NC part programming using CNC milling or lathe machine	
COURSE LEARNING OUTCOMES (CLO) : 1. Calibrates machining code (G and M code) from CAD/CAM software to plan and devise holes process and milling/lathe project. (P3, PLO3) 2. Build a project using CNC milling or lathe machine by utilizing related CAD/CAM simulation software. (P4, PLO5) 3. Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a project. (A3, PLO12)	



NAME OF COURSE	MANUFACTURING SYSTEM
CODE COURSE	DJF41052
CREDIT VALUE	2
PREREQUISITE	NONE
<p>SYNOPSIS: MANUFACTURING SYSTEM explains the terminologies and concepts that are necessary in the learning of manufacturing system. It provides knowledge regarding fundamental of manufacturing system, industrial robotics, process layout, material handling systems and Lean system.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Apply the basic concepts of manufacturing system, robotic in manufacturing, process analysis, process layout and material handling system. (C3, PLO2) 2. Investigate problem solving in Lean system. (C4, PLO4) 3. Demonstrate good communication skills in engineering society. (A3, PLO10) 	

SEMESTER 5

NAME OF COURSE	COMMUNICATIVE ENGLISH 3
CODE COURSE	DUE50032
CREDIT VALUE	2
PREREQUISITE	COMMUNICATIVE ENGLISH 2
<p>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 to apply the job hunting mechanics effectively in their related fields. Students will learn to gather data and present them through the use of graphs and charts. Students will also learn basics of job hunting mechanics which include using various job search strategies, making enquiries, and preparing relevant resumes and cover letters. The students will develop communication skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Present gathered data in graphs and charts effectively using appropriate language forms and functions(A2) 2. Prepare a high impact resume and a cover letter, highlighting competencies and strengths that meet employer's expectations (A4) 3. Demonstrate effective communication and social skills in handling job interviews confidently (A3) 	
NAME OF COURSE	ENTREPRENEURSHIP
CODE COURSE	MPU22012
CREDIT VALUE	2
PREREQUISITE	NONE
<p>SYNOPSIS: ENTREPRENEURSHIP focuses on the fundamentals and concept of entrepreneurship in order to inculcate the value and interest in students to choose entrepreneurship as a career. This course can help students to initiate creative and innovative entrepreneurial ideas. It also emphasizes a preparation of a business plan framework through business model canvas.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Propose the value proposition of entrepreneurial idea using Business model Canvas (A3) 2. Develop a viable business plan by organizing business objectives according to priorities (A4) 3. Organise the online presence business in social media marketing platform (A3) 	



NAME OF COURSE	PROJECT 2
CODE COURSE	DJJ 50193
CREDIT VALUE	3
PREREQUISITE	PROJECT 1
<p>SYNOPSIS: PROJECT 2 is a continuation of Project 1 focusing on project planning, development, project report and presentation. This course introduces students with ability and skills in conducting project planning, development and management based on their project design. It also provides the student with technical writing and presentation skills. The project will be implemented in a group and each group will work on a project under lecturer(s) supervision. Project titles will be based on specialization and students will be assessed individually</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Demonstrate appropriate and creative solution in solving project problems (P5, PLO3) 2. Perform project plan to achieve objectives with valid and reliable results (P4, PLO4) 3. Explain the project work and defend project outcomes effectively with good communication skills (A4, PLO10) 4. Organize project activities and outcomes in report accordance to the specified standard format that applies engineering management principles (P4, PLO11) 	
NAME OF COURSE	MANUFACTURING CONTROL
CODE COURSE	DJF51062
CREDIT VALUE	2
PREREQUISITE	NONE
<p>SYNOPSIS: MANUFACTURING CONTROL provides knowledge about basic principles and concept on managing an organization and major levels in manufacturing planning and control system (MPC) which will help students in making forecast, production plan, control production and manage inventory. This course also gives knowledge about production scheduling. It also includes knowledge in managing MRP system (material management), production scheduling and inventory management.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Attain the concept and application of Manufacturing Forecasting, Production Scheduling, Inventory Control, Productivity and Capacity Planning. (C3, PLO2) 2. Integrate Material Requirement Planning (MRP) and inventory control for manufacturing process controlling activities. (C4, PLO4) 3. Adopt project management framework to develop a Material Requirement Planning (MRP) according to inventory management. (A3, PLO11) 	
NAME OF COURSE	JIG AND FIXTURE DESIGN
CODE COURSE	DJF51072
CREDIT VALUE	2
PREREQUISITE	NONE
<p>SYNOPSIS JIG AND FIXTURE DESIGN covers basic production needs in industry. The topics taught includes types and functions of jigs and fixtures, supporting and locating, clamping and work holding principles, design economics, designing and constructing plate jig and plate fixtures. This course also provides knowledge in management, sustainability and manufacturing systems.</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Apply the concepts and principles of jigs and fixtures in design. (C3, PLO2) 2. Calibrate the 3D design by using CAD/CAM software to plan and devise mini project. (P4, PLO3) 3. Demonstrate convictions towards environment and sustainability to complete assigned tasks during mini project sessions. (A3, PLO7) 	



NAME OF COURSE	QUALITY CONTROL
CODE COURSE	DJF51082
CREDIT VALUE	2
PREREQUISITE	NONE

SYNOPSIS: QUALITY CONTROL provides knowledge on basic principle and concept of quality including statistical method in controlling products quality or services. This course also emphasizes on the application of Control Chart and Quality Control tools and also explains the quality improvement technique.

COURSE LEARNING OUTCOMES (CLO):

1. The relation of statistics and quality management system in understanding of quality control and their application tools. (C3, PLO1)
2. Determine the related quality tools and techniques to control the quality of products or services based on case study. (C4, PLO2)
3. Demonstrate ability to work in team to complete the assigned tasks. (A3, PLO9)

NAME OF COURSE	TOOL DESIGN
CODE COURSE	DJF51092
CREDIT VALUE	2
PREREQUISITE	NONE

SYNOPSIS TOOL DESIGN exposes the students to the knowledge of datum concept, geometric tolerances and fundamentals to design tool based on clamping and locating principle. The topics also covers the principle of tool applications in metal and non-metal process. All the topics discussed will enable the students to plan and identify the use of tooling. They will also be exposed to the application of tooling in related industries.

COURSE LEARNING OUTCOMES (CLO):

1. Apply appropriately the concepts of tool design method and tooling material selection in designing tools. (C3, PLO2)
2. Perform the simulation of mould, tool and die design using CAD/CAM software. (P4, PLO3)
3. Demonstrate conviction towards environment and sustainability to complete assigned tasks during practical work sessions. (A3, PLO7)

ELECTIVES

NAME OF COURSE	MANUFACTURING ECONOMY
CODE COURSE	DJF52032
CREDIT VALUE	2
PREREQUISITE	NONE

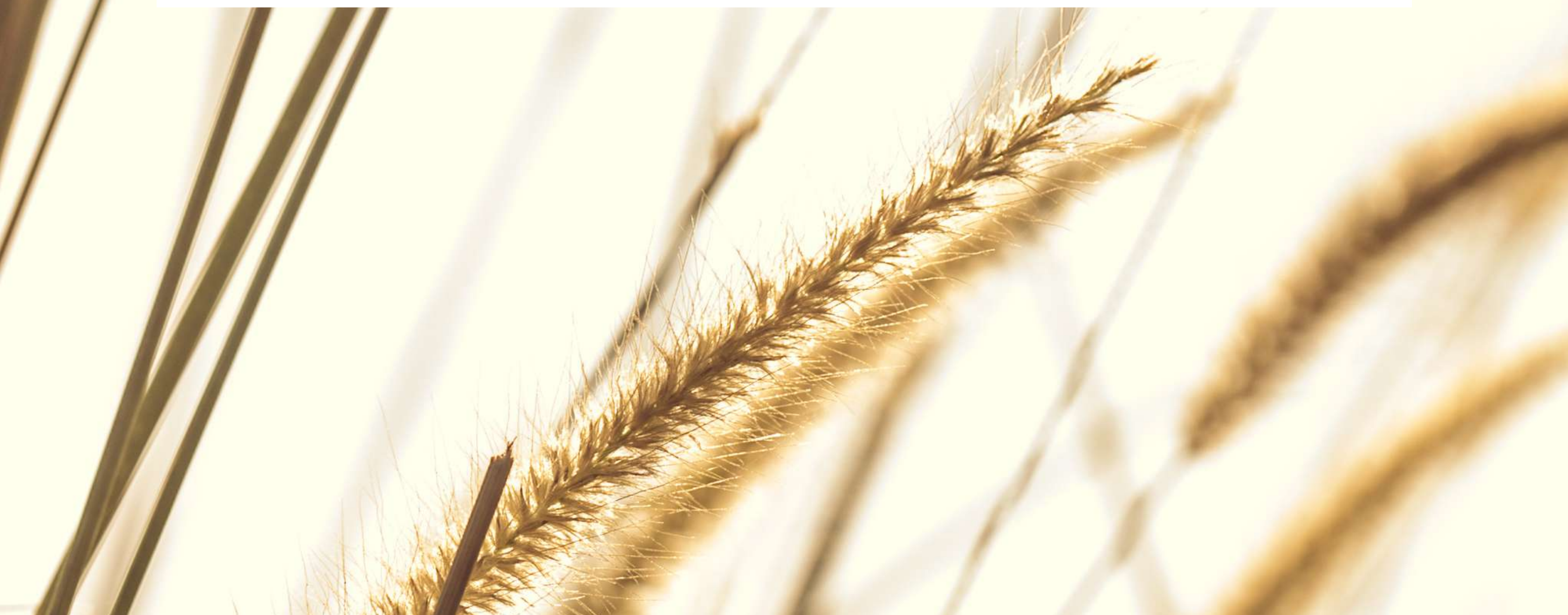
SYNOPSIS: MANUFACTURING ECONOMIC provides knowledge and understanding for students on economy aspect which includes concepts, categories, factor of supply and demand, basic element and characteristics of cost and decision involve in manufacturing process. This course also focuses on fixed cost, variable cost, direct and indirect cost, actual cost and break-even analysis which leads towards eliminating the wastage in manufacturing

COURSE LEARNING OUTCOMES (CLO):

1. Apply knowledge to identify and classify of fixed cost, variable cost, direct and indirect cost which contribute to total cost in production. (C3, PLO2)
2. Analyze correctly the actual cost and break-even analysis for decision making process. (C4, PLO4)
3. Demonstrate ability to manage project including financial aspect for the task assigned. (A3, PLO11)



NAME OF COURSE	ENGINEERING INDUSTRIAL
CODE COURSE	DUT600610
CREDIT VALUE	10
PREREQUISITE	Fulfill the requirements of Industrial Training Guideline
<p>SYNOPSIS: ENGINEERING INDUSTRIAL TRAINING course will provide student with first-hand experience in an engineering-practice environment outside the polytechnic. Student will practice their knowledge and skill based on knowledge learned in polytechnic through industry supervision to acquire the craft skill and essential. Student also need to demonstrate their responsibilities and professional ethic, communication, teamwork and inter-personal and life-long learning skills at the workplace</p>	
<p>COURSE LEARNING OUTCOMES (CLO):</p> <ol style="list-style-type: none"> 1. Perform the assigned task accordingly based on job scope requirement (P4,PLO5) 2. Demonstrate responsibilities as an engineering technician while dealing with people of various background (A5,PLO6) 3. Practice good working ethics while undergoing industrial training (A5,PLO8) 4. Display ability to work in a team or independently base on the given task (P4,PLO9) 5. Demonstrate oral communication skill in performing job requirement (A3, PLO10) 6. Write a report based on given task accordingly to technical practice (C3,PLO10) 7. Display life long learning skill in completing the given task (P4, PLO12) 	



Thank

you



prepared by roihan romli