POLITEKNIK NILAI, NEGERI SEMBILAN

STUDENT HANDBOOK

PROGRAMME

DIPLOMA KEJURUTERAAN MEKANIKAL
INTRODUCTION


PNS berpindah ke kampus tetap di Kompleks Pendidikan Bandar Enstek, Negeri Sembilan pada September 2011 di atas tapak seluas 101.5 ekar yang memuatkan 37 blok bangunan pentadbiran, akademik, kamsis dan kediaman staf. Kampus ini mampu menampung pelajar seramai 2,400 orang pelajar dengan kapasiti penginapan di kamsis seramai 1,200 orang pelajar.

PNS mempunyai jumlah kakitangan seramai 67 orang yang terdiri daripada 48 orang pensyarah dan 19 orang staf sokongan. Jumlah pelajar adalah seramai 446 orang pelajar yang sedang mengikuti program Diploma in Business Studies (e-Commerce), Diploma in Islamic Banking and Finance dan Diploma in Logistics and Supply Chain Management.


ADMINISTRATION

Head of Department
Faridah binti Suboh

Head of Program - DKM
Agus bin Dollah

Head of Program – DEM
Mohd Saifuddin bin Ahmad

Lecturers

Siti Jariah binti Ibrahim
Amir Afuan bin Nordin
Samsinor binti Kamarudin
Khairul nizam bin Kamarudin
Maheran binti Sulaiman
Seri Nian Bt Akmad
Ahmad Razimi bin Md Lazim
Mohd Taufik Rezza bin Mohd Foudzi
Roslan bin Kamaruddin
Syahrulazmin bin Sarmin
Nairul akmar bin Akashah
Norliza binti Idris

Marliyana binti Ya’acob
Shuhrzi bin Md Salleh
Saifa Masfuza binti Salan
Hairul Azam bin Mohd Mokhtiar
Mokhsein bin Abdul Manap
Halimah binti Ismail
Umi Suriayana binti Jamion
PROGRAMME OVERVIEW

For the past few decades, industries have evolved and progressed rapidly. The Ninth Malaysia Plan was drawn in response to the current global needs and to enable Malaysia to stay competitive in the world market. Thus, to keep abreast with rapid technological advancements and evolving requirements in industries today, Department of Polytechnic Education (DPE) constantly collaborates with major industry players in the country in developing the respective curriculum. One of the most important factors driving the growth of productivity is by having a qualified and talented manpower in order for the industry to develop and remain competitive in the world market. This is equally true in industries where there is a rapidly growing demand for highly competent and technically savvy workforce. The activities of many industries require increasingly competent technician in engineering field, particularly in mechanical engineering. In response to these issues, Curriculum Development and Evaluation Division of the Department of Polytechnic Education has developed and introduced Diploma in Mechanical Engineering for polytechnic. This programme aims to prepare students with knowledge, skills and abilities necessary in the mechanical engineering industries. To ensure the curriculum content fulfils the industrial requirement, several key players from related industries have been involved in the curriculum development process. Diploma in Mechanical Engineering for polytechnic is developed to give balanced emphasis on theoretical and practical aspects. The programme will take six semesters to complete, relatively three academic semesters at their respective polytechnics and one semester of industrial training at relevant industries during the fourth semester. Students are required to return to their respective institutions for the completion of the programme in the fifth and sixth semester.

PROGRAMME AIMS

Graduates of diploma in Mechanical Engineering Programme at Polytechnics will have knowledge, skills and attitude that will allow them to make tangible contributions and meet new technical challenges. They will possess entrepreneurial skills, practice good work ethics, be able to promote good morality and behavior, and continuously enhance their knowledge and skills. The graduates will communicate and interact responsibly and be able to contribute effectively as a team member. They will also be adaptable to new changes at the workplace.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

1. knowledgeable and skilled in the field of mechanical engineering in accordance with industry requirements.
2. aware and able to solve problems practically and ethically in mechanical engineering.
3. able to communicate effectively and demonstrate leadership qualities with the characteristics of good teamwork in the industrial environment.
4. able to demonstrate entrepreneurial skills and pursue lifelong learning in line with the national vision.
PROGRAMME LEARNING OUTCOMES (PLO)

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

1. apply knowledge of mathematics, science and engineering fundamentals to well defined mechanical engineering procedures and practices.
2. demonstrate practical skills which includes the ability to troubleshoot, repair and do maintenance work for mechanical equipment;
3. communicate effectively with the engineering community and the society at large.
4. apply creative and critical thinking in solving problem related to assigned tasks;
5. demonstrate awareness and consideration for societal, health, safety, legal and cultural issues and the consequent responsibilities, taking into account the need for sustainable development;
6. cognize the need for professional development and engage in independent acquisition of new knowledge and skill.
7. recognize the need for entrepreneurship
8. demonstrate an understanding of professional ethics, responsibilities and norms of mechanical engineering practices.
9. function individually or in teams, effectively, with a capability to be a leader;

DKM PROGRAMME STRUCTURE

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**Note:**
Recommended elective courses depend on facilities and capability of lecturer at each Polytechnic. Students are required to complete one elective course at each semester 5 and 6. Minimum of 4 credits of elective courses.

*For Muslim Students
**For non Muslim students

**POLYTECHNIC'S GENERAL COURSES**

General studies department was established with the objective to help Politeknik Nilai introduce students to the importance and value of spiritual, human and universal human values of purity in a dignified living as well as emphasizing the importance of using the English oral skills (speaking and communication) and writing skills. This will enable students functioning effectively in the context of his future. In daily life, every human being cannot prevent himself from human contact and interaction with each other. Thus, human relations through inter-personal aspects and intra-personal skills are an art which can assess the humanitarian in a person. Behaviour and actions cannot be taught through a technical education and professional skill only without spiritual and human values. Advanced nations in science and technology, but disregards the aspect of human behaviour will be considered as no glory and goodness of these people even seen as a nation who are not civilized and dignified. Therefore, the general education department serves as a complement to all departments in Polytechnic Sultan Haji Ahmad Shah in helping the students fill in the spiritual and human values.

The courses offered in this department are general courses which include modules in Islamic Education, Moral Education, Islamic Civilization, Communicative English, Co-Curricular, Soft Skills and Occupational Safety and Health (OSH).

**COURSE SYNOPSIS**

**AA101 Islamic Education 1**
AA102 Moral Education 1

AA103 Bahasa Arab 1
BAHASA ARAB 1 dibentuk untuk membina kemahiran mendengar dan bertutur dalam Bahasa Arab. Pelajar akan diperkenalkan dengan bunyi-bunyi vokal dan konsonan Bahasa Arab. Ganti Nama Diri akan digunakan sebagai paksi kepada 14 bentuk perubahan kata Bahasa Arab. Penekanan komunikasi akan diterapkan melalui 42 dialog yang memberi penekanan kepada konteks sebenar komunikasi dan gaya bahasa yang diperlukan. Pelajar akan mampu untuk menuturkan frasa-frasa mudah dalam konteks komunikasi harian.

AA104 Mandarin 1
MANDARIN 1 is an elementary language course intended for polytechnic students who have no background in Mandarin. The course consists of an introduction to Mandarin and aims to provide basic communicative skills to the learners. The course covers all four language skills. It provides basic writing skills in both Romanised Chinese (Hanyu Pinyin) and Chinese characters (Hanzi). The course also attempts to provide a basic insight into the Chinese culture.

AA201 Islamic Education 2

AA202 Moral Education 2

AA203 Bahasa Arab 2

AA204 Mandarin 2
MANDARIN 2 is an elementary language course intended for polytechnic students who have completed and passed Mandarin I. The course provides basic communicative skills to the learners and aims to enhance the skills acquired in Mandarin II. The course covers all four language skills and encourages the use of the language in daily activities. It provides basic writing skills in both Romanized Chinese (Hanyu Pinyin) and Chinese characters (Hanzi). The course also attempts to provide a basic insight into the Chinese culture.

AA301 Islamic Civilisation
AE101 Communicative English 1
COMMUNICATIVE ENGLISH 1 focuses on speaking skills to develop the ability to communicate effectively and confidently. It is designed to provide students with useful expressions that can be used in a wide variety of social interactions and situations. It also provides students with an opportunity to initiate and participate in group discussions.

AE301 Communicative English 2
COMMUNICATIVE ENGLISH 2 emphasises the skills needed to describe products and services as well as processes and procedures. It focuses on the skills to give and respond to instructions. The course will also enable students to make and reply to enquiries and complaints in their future workplace.

AE501 Communicative English 3
COMMUNICATIVE ENGLISH 3 aims to develop critical reflection skills in the students. It also emphasises work-related communication skills. Students will learn the process of job hunting which includes job search strategies and awareness of workplace issues. The students will develop skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and able to establish rapport and respond appropriately during interviews.

AR101 Co-Curriculum 1
KOKURIKULUM 1 menekankan kepada kemahiran asas yang meliputi aktiviti berkawad, pertolongan cemas, pencegahan kebakaran, protokol dan etiket sosial dan juga pengurusan diri dan jati diri.

AR201 Co-Curriculum 2
KOKURIKULUM 2 memfokuskan kepada penyediaan pengetahuan dan pengalaman yang boleh dijalankan di dalam dan di luar bilik kuliah bagi perkembangan mental, minat, bakat, jasmani, rohani dan pembentukan nilai-nilai estetika serta sosial yang positif.

AS101 Soft Skills
SOFT SKILLS covers basic knowledge and skills in soft skills. The course provides exposure and experience for personality development, communication skills, management, leadership, writing and appreciation of professional ethics. This course will develop proactive spirit and attitude in students thus giving confidence to become excellent and charismatic individuals.

AT401 Industrial Training
INDUSTRIAL TRAINING covers the basic knowledge and skills of the internship which students will undergo during the fourth semester of the Diploma program. This course provides exposure and experience to students in terms of technology literacy, effective communication, development of human capital, policies, procedures and regulations, professional perspective and reporting. This course will build enthusiasm and a proactive attitude in students and hence boost their confidence to become excellent trainees.

AW101 Occupational Safety And Health 1
OCCUPATIONAL SAFETY AND HEALTH 1 is designed to impart understanding of the basic of safety and health in workplace setting. This course presents aspects of occupational safety and health, which are essential for employees to practise safe and healthy environment, resulting in less hazards at the workplace. Emphasis is placed on the understanding of regulations, OSH management, accident prevention and occupational First-Aid methods.

PB201 Entrepreneurship
ENTREPRENEURSHIP focuses the principles and concept of entrepreneurship. This course concentrate on the systematic methods of getting business ideas. This course also prepare the students on ways to conduct and control the business including fundamental of management, marketing and financing. It also emphasize on the preparation of business plan, thus developing their entrepreneurial skills.
**BC101 Computer Application**

COMPUTER APPLICATION provides knowledge and skills to students relating to various types of computer systems and its application especially pertaining to hardware and software. This course also exposes students to different packages of software applications for word processor, spreadsheet, project management, presentation and internet. The students will also have opportunity to manipulate and create a variety of techniques and styles to produce documents, spreadsheets, charts and presentations. This course emphasizes on the practical aspects of using computer applications.

**JJ101 ENGINEERING DRAWING**

ENGINEERING DRAWING provides the student with the basic fundamental of engineering drawing. 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.

**JJ102 ELECTRICAL TECHNOLOGY**

ELECTRICAL TECHNOLOGY exposes students to 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.

**JJ103 MECHANICAL WORKSHOP PRACTICE 1**

MECHANICAL WORKSHOP PRACTICE 1 exposes the students to welding, machining and fitting which involves 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.

**JJ104 WORKSHOP TECHNOLOGY 1**

WORKSHOP TECHNOLOGY 1 provides exposure to the students in using hand tools correctly and safely, technique of operating drilling machine and lathe machine. It also emphasis on ways of operating gas and arc welding equipment correctly and safely and gives emphasis on concept of tolerance in production process.

**JJ108 ENGINEERING LABORATORY 1**

ENGINEERING LABORATORY 1 exposes the students to practical laboratory experiments in Electrical Technology and Engineering Mechanics. These experiments consist of collection of data through observation and experimentation, formulation and testing of theory.

**JJ203 MECHANICAL WORKSHOP PRACTICE 2**

MECHANICAL WORKSHOP PRACTICE 2 exposes the students to gas and arc welding, machining and foundry works. Safety procedure practice is heavily emphasized in the workshop.

**JJ204 WORKSHOP TECHNOLOGY 2**

MECHANICAL WORKSHOP PRACTICE 2 exposes the students to gas and arc welding, machining and foundry works. Safety procedure practice is heavily emphasized in the workshop.

**JJ205 ENGINEERING MECHANICS**

ENGINEERING MECHANICS focus on theoretical knowledge in statics and dynamics. This course provides students with fundamental understanding of forces and equilibrium, resultants, equilibrium of a rigid body and structural analysis. This course also covers an introduction to dynamics, kinematics and kinetics of particles.

**JJ206 COMPUTER AIDED DESIGN**

COMPUTER AIDED DESIGN 1 provides a comprehensive introduction to computer-aided design software. Students will learn to navigate and use the software to create basic designs.
JJ207 THERMODYNAMICS
THERMODYNAMICS 1 exposes students to the basic concepts of thermodynamics related to unit, dimension, first law of thermodynamics and ideal gas model. This course also emphasizes on concepts on non flow process, flow process, properties of steam, second law of thermodynamics and properties of mixture and combustion processes. This course also provides knowledge and understanding of theory, concepts and application of principles to solve problems related to thermodynamics processes.

JJ303 MECHANICAL WORKSHOP PRACTICE 3
MECHANICAL WORKSHOP PRACTICE 3 exposes the students in use of Tungsten Inert Gas (TIG) and Metal Inert Gag (MIG) welding machines. Students also will perform a task by using lathe and milling machine. In addition students will be exposed in entrepreneurships. Safety procedures practice will be stressed in workshop.

JJ306 COMPUTER AIDED DESIGN 2
COMPUTER AIDED DESIGN 2 exposes the students to learn the fundamental principles of 3D parametric part design and production-ready part drawings using 3D CAD software. Students will know the various method of creating a solid model using extrude, revolve, swept, assembly, simulation and animation. Hands-on exercises representing real-world, industry-specific design of mechanical engineering will also be covered in this course.

JJ308 ENGINEERING LABORATORY 2
ENGINEERING LABORATORY 2 exposes the students to the demonstration at the real equipment of Fluid Mechanics, Strength of Materials and Thermodynamics 1. These experiment consists of the collection of data through observation and experimentation, formulation and testing of theory.

JJ309 FLUID MECHANICS
FLUID MECHANICS provides students with a strong fundamental understanding on fluid mechanics principles relating to basic foundation knowledge on fluid properties and behavior in a number of static and dynamic situations.

JJ3010 STRENGTH OF MATERIAL
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.

JJ311 MECHANICS OF MACHINES
MECHANICS OF MACHINES exposes the students with knowledge on basic techniques and concepts of mechanics of machines. This course also gives knowledge on how to create and use simple methods to solve problem in relation to hoists, friction, simple harmonic motion, velocity and acceleration diagram, friction and belt drives.

JJ503 Mechanical Workshop Practice 4
MECHANICAL WORKSHOP PRACTICES 4 allows students in getting use extensively and skillfully operate machine tools, extend their experiences on indexing, precision grinding, CNC machine and able to work in a clean and safe workshop environment.

JJ302 MATERIAL TECHNOLOGY 1
MATERIAL TECHNOLOGY 1 provides students an understanding on pure metal, alloy and other non-metal materials that are commonly used in the engineering field, including a study on metal and alloy microstructure. Students also learn the processes of metal work and specific materials used to produce engineering components.
JJ507 THERMODYNAMICS 2
THERMODYNAMICS 2 expose students to the basic concepts of thermodynamics related to heat, work, changes of energy and the characteristics of a thermodynamics processes. This module also emphasis on steam power plant, gas turbine, refrigeration cycle and combined power cycle. This course also provides knowledge and understanding of theory, concepts and application of principles to solve problems related to thermodynamics processes.

JJ508 ENGINEERING LABORATORY 3
ENGINEERING LABORATORY 3 exposes the students to the demonstration at the real equipment of Mechanics of Machine, Thermodynamics and Materials Technology. This experiment consists of the collection of data through observation and experimentation, formulation and testing of theory.

JJ512 PNEUMATICS & HYDRAULICS
PNEUMATICS & HYDRAULICS provides knowledge and understanding to the importance of pneumatics and hydraulics circuits, equipment and design along with its usage in the industry sector.

JF504 CADCAM
CADCAM explain the theory and basic of coding languages, structure and the use of CAD/CAM systems for generating and verifying tool path. Besides that, students will learn how to create various machining code and transfer to CNC machine using CADCAM software. Students also exposure to modern manufacturing system as well as Flexible Manufacturing System (FMS), Computer Integrated System (CIM) and Reverse Engineering(RE).

JJ513 ENGINEERING DESIGN
ENGINEERING DESIGN provides knowledge on basic engineering design. It emphasizes mathematical analysis for simple component design in engineering such as key, pin joint, bolt, nut and welding. It also provides knowledge on gear design and selection of bearing.

JJ514 PROJECT 1
PROJECT 1 prepares students with basic skills knowledge in preparing research proposal and a well written paperwork. This module emphasize on personal development in preparing a good presentation.

JJ517 INSTRUMENTATION & CONTROL
INSTRUMENTATION & CONTROL exposes the students to the basic principles in control system and its usage in industrial sector are the main focus in this course. Instrumentation and control also provides knowledge to the students in components measurement in control system that are normally used in industries.

JF608 QUALITY CONTROL
QUALITY CONTROL provides knowledge on basic principle and concept of quality including statistical method in controlling products quality or services. This course also emphasize on the application of Control Chart and Quality Control tools. In addition, this course also explains the importance of International Standard of Quality Assurance Standard, ISO 9000 for an organization.

JJ615 MECHANICAL COMPONENTS AND MAINTENANCE
MECHANICAL COMPONENTS AND MAINTENANCE covers basic mechanical components needs in Industry. The topic includes maintenance principles, procedures, lubrication, power transmission, bearing, clutches and brakes and pumps, valves and compressor. This course also gives knowledge and skills regarding maintenance of mechanical components and assemblies.

JF616 MAINTENANCE MANAGEMENT
MAINTENANCE MANAGEMENT covers topic such as maintenance organization, maintenance strategies system, system approach to maintenance, maintenance planning and scheduling and computerized maintenance management system (CMMS). This course also includes knowledge regarding maintenance of facilities and equipments activities in a good working condition and develops good management knowledge.
JJ618 ENGINEERING PLANT TECHNOLOGY

ENGINEERING PLANT TECHNOLOGY provides an introduction to plant technology, such as steam powered plant, steam turbine, gas turbine plant, diesel power plant, compressed air plant and water pump.

JJ619 INDUSTRIAL MANAGEMENT

INDUSTRIAL MANAGEMENT provides students with a strong fundamental understanding of industrial management prospects, production system planning such as inventory, scheduling, production system operation, facilities, plan location, layout and line balancing. This course also provides knowledge in quality control and human resource management.

JJ614 PROJECT 2

PROJECT 2 introduces the students to the concept in conducting a design or case study. The students select a project, list the project needs, the project process involve, cost estimation, project schedule and applied appropriate methodology in the project planning. It also involves project implementation, project report and presentation.

REGULATIONS FOR COURSE REGISTRATION

GUIDELINE
1. Students must attach a copy of latest Final Examination Results
2. Obtain the signature of the course lecturer
3. Then submit the completed form to the Academic Advisor (PA)
4. Finally get the signature of Academic Advisor and Head of Department

CARRY COURSES/CARRY SEMESTER
1. Students need to repeat all failed courses (grade point <2.00) either the General Courses (such as Islamic Studies, Civilization etc) or the Technical Courses – to repeat the semester
2. Students must register to carry courses with courses that have been set for that semester after getting advice from the academic advisor and approval by the head of department.
3. Students should repeat all the learning activities of the courses in addition to other courses

DROP/ADD COURSES
1. Students who have registered for courses can drop or add courses, provided that the number of credit hours for that semester no less or no more than a specified number of credit hours
2. Students are not allowed to drop the carry courses that have been registered
3. The dropping and adding courses must be done within the prescribed period and they must seek for advice from Academic Advisor (PA) and approval from Head of Department

DURATION
1. Registration courses – two weeks after registration
2. Drop/Add courses – six weeks after registration
ATTENTION
If the students do not register for carry, elective or compulsory courses for the current semester:

i. All assessment for the courses will not be taken into account; and

ii. Students will be given an F and grade point of 0.00 for the courses; and

iii. Students are considered has completed the courses and fail for the first time


Notes:
For further information, students can contact the Course Registration Committee /Examination Unit

COURSE EXEMPTION APPROVAL
Approval for course exemption is the prerogative of the polytechnic and is final.

CONCLUSION
This document is expected to provide guidelines and uniformity in handling course exemptions procedures at polytechnics.

CONFERMENT OF DIPLOMA
Student will be conferred certificate/diploma if they:

i. Pass all required modules

ii. Achieve the required number of credit hours for the course

iii. Complete industrial training and meet all related conditions

iv. Fulfill all course requirements and is approved by the Examination Board