



KEMENTERIAN PENGAJIAN TINGGI

POLITEKNIK
MALAYSIA
SULTAN SALAHUDDIN ABDUL AZIZ SHAH

WITH RECOGNITION



JABATAN
PEMBANGUNAN
KEMAHIRAN (JPK)
**KEMENTERIAN
SUMBER MANUSIA**

*Polytechnic
Curriculum* &

*National Occupational
Skills Standard*

Mapping Process

GUIDEBOOK 2022

**MANUAL
PEMBANGUNAN KURIKULUM
PROGRAM PENGAJIAN POLITEKNIK**

JABATAN PENGAJIAN POLITEKNIK
KEMENTERIAN PENDIDIKAN MALAYSIA



JABATAN PEMBANGUNAN
KEMAHIRAN (JPK)



STANDARD KEMAHIRAN
PEKERJAAN KEBANGSAAN

NATIONAL OCCUPATIONAL
SKILLS STANDARD

PUSAT BERTAULIAH

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*P*olytechnic Curriculum & National Occupational Skills Standard Mapping Process



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POLYTECHNIC CURRICULUM & NATIONAL OCCUPATIONAL SKILLS STANDARD MAPPING PROCESS

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The background of the lower half of the page features a photograph of a modern building, likely a school or university, with a red roof and greenery. Overlaid on this image is a large, stylized logo that reads 'We Love PSA'. The word 'We' is in white, 'Love' is represented by a red heart shape, and 'PSA' is in large, bold, white letters. The entire logo is set against a dark, semi-transparent rectangular background.



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He started his career as a Vocational Training Officer as early as 1993 at JPK. He has worked in several Divisions within the JPK including the Accreditation, Certification and now in the NOSS Division, Curriculum Management Unit. He is actively involved in the WIM development process, in addition to being a panelist in the validation of WIM developed by agencies that offer skills training.

PREFACE

Alhamdulillah, all praise and thanks to Allah ﷻ for His mercy and grace to all of us as the people of Prophet Muhammad ﷺ. Polytechnic Curriculum Mapping Guidebook & National Employment Skills Standard can be produced according to the set plan. This book is published to guide the processes of developing curriculum modules to be equivalent to the National Occupational Skills Standard (NOSS) to implement programmes under PSA Certified Centers. This medium in the form of dual certification is a catalyst for the unity of cooperation between polytechnics, industry, and the ministry in realising TVET's wishes. A wreath of acknowledgment for the PSA management and the PSA Certified Center Executive Committee who are the backbone of the success of producing this guidebook. It is hoped that the publication of this book can be a source of inspiration and reference for the Polytechnic to apply for accreditation as an Accredited Center recognised by the Ministry of Human Resources.

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*A*bstract

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ABSTRACT

Malaysian Skills Certificate (SKM) is a certificate issued by the Skills Development Department (JPK), Ministry of Human Resources for skills programmes offered by Training Providers whether public or private. The benefits of this Skills Certification are recognised by the industry in Malaysia in providing opportunities for career paths and self-development that are comparable to career paths based on academic qualifications. Sultan Salahuddin Abdul Aziz Shah Polytechnic took the initiative to establish an Accredited Center to enable Mechanical Engineering Diploma (MED) students and the general public to obtain additional accreditation from the Skills Development Department, Ministry of Human Resources. **The most important process in the establishment of an Accredited Center is related to the curriculum.** To allow students who are following programmes at polytechnics or public institutions to obtain additional certificates, namely the Malaysian Skills Certificate or the Modular Certificate, JPK requires that the existing curriculum must meet the requirements of the National Occupational Skills Standard (NOSS). **The mapping process is an important factor in the success and qualification of the awarding process as a Certified Center.** The Mapping Guidebook was produced to be a special reference source for polytechnics in implementing accreditation programmes under the Skills Development Department. **This book will have an impact on Accredited Centers in helping to make the SKM and Modular programmes a success to produce individuals with skill qualifications recognised by the current industry.**

INTRODUCTION

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INTRODUCTION

POLYTECHNIC CURRICULUM & NATIONAL OCCUPATIONAL SKILLS STANDARD MAPPING PROCESS is a method of mapping programme syllabus in polytechnics based on NOSS requirements to implement the Malaysian Skills Certification System (SKPK). The skill certification equivalence method in this guide is based on the concept of Accredited Centers (AC) accreditation. This mapping guide is one of the conditions for implementing the full certification programme of the Malaysian Skills Certificate (SKM) and the Modular Statement of Achievement (PC) programme according to the competencies of the selected units. The mapping methods with the polytechnic curriculum/syllabus are followed according to SKPK regulations. Before understanding the mapping process in this guide, it is necessary to explain the terms used by the Polytechnic Curriculum System and the Malaysian Skills Certification Curriculum System..

Polytechnic is one of the higher education institutions under the Ministry of Higher Education (MOHE) which plays an important role in leading Technical & Vocational Training Education (TVET) at the tertiary level to provide a semi-professional workforce in the technical, trade and service fields for the public and private employment sectors. It was first introduced in Malaysia in 1969 under the United Nations Development Plan (UNDP) through the establishment of the Ungku Omar Polytechnic (UOP) in Ipoh Perak. This education was further strengthened by the acknowledgement from the Cabinet Committee in education in 1979 and the first National Industrial Master Plan (1985 - 1995). (Source: Polytechnic Information, JPP April 2012 Edition).

Curriculum can be interpreted as a process of experience and learning outcomes planned through the systematic reshaping of knowledge and experience under institutional supervision and industry-driven for the continuous development of student competencies. Curriculum design is defined as the process of building strategic learning opportunities based on the competencies required to enable students to achieve the appropriate scope and level for a discipline of study. According to the core principles underlying OBE, the starting point for all curriculum design should start from the learning outcomes that all students need to achieve at the end of learning. For that, all decisions about curriculum design should be aligned with the learning outcomes set. (Source: JPP, Polytechnic Study Programme Curriculum Development Manual, 2013).

DEVELOPMENT OF SKILLS DEPARTMENT

The Development of Skills Department (JPK), previously known as the National Vocational Training Council (MLVK) is a Department under the Ministry of Human Resources that was established on May 2, 1989, through the reorganisation of the National Craft Training and Certification Board (LLPPKK) that was established in 1971. MLVK was changed to JPK after the National Skills Development Act 2006 (Act 652) came into force on 1 September 2006. JPK is a government agency responsible for formulating, promoting, and coordinating the strategy and development of the nation's skilled workforce in line with the vision and mission entrusted to produce workers for job requirements and recognition at the national and international levels. (www.dsd.gov.my).

ACCREDITATION CENTER

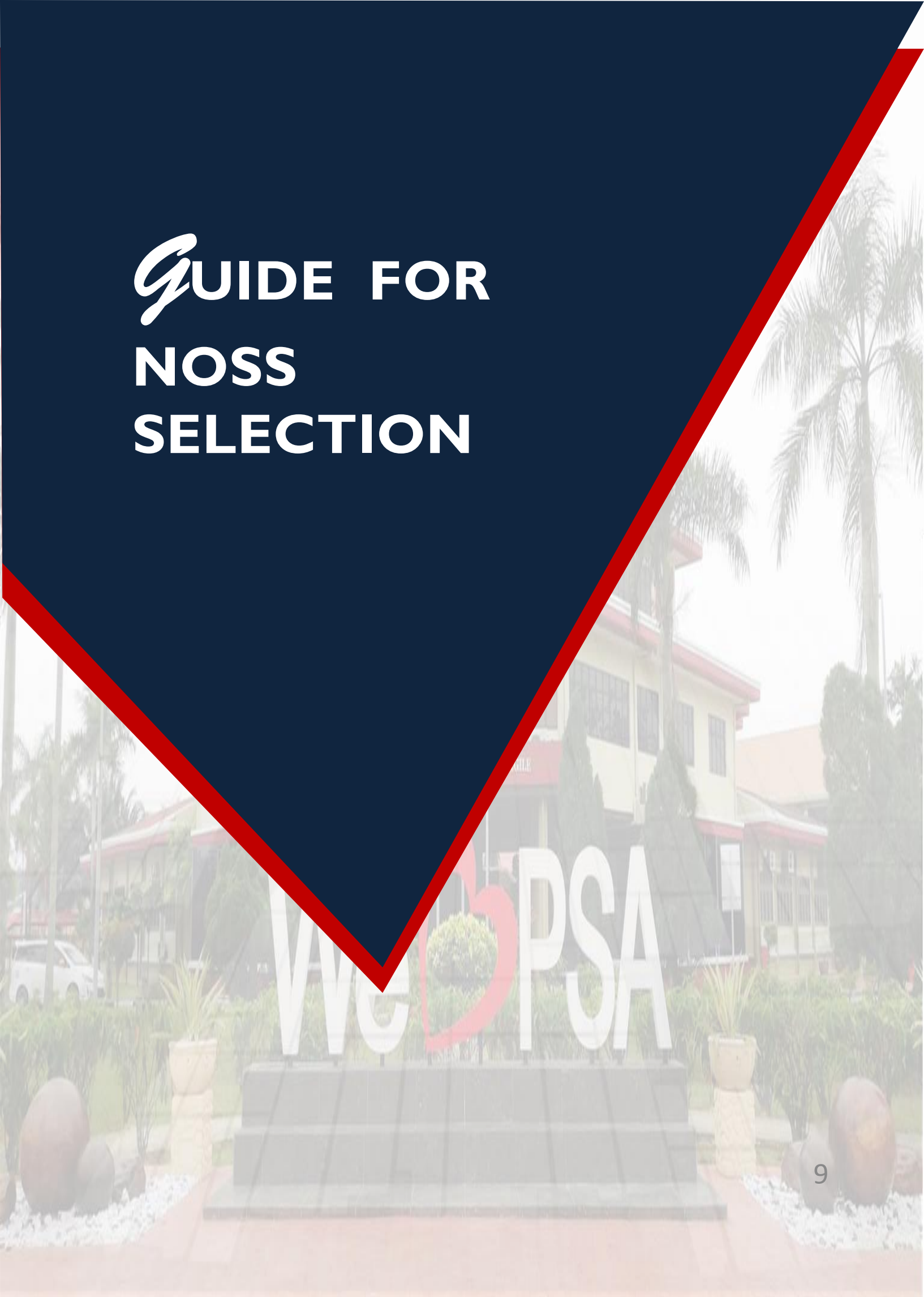
Accredited Centers are skill training providers, whether training institutions or workplaces that have been approved by the Skills Development Department (JPK) to conduct skills training and offer Malaysian Skills Certification for specific fields and skill levels based on NOSS. There are two categories of Certified Centers, namely Public Accredited Centers and Private Accredited Centers. Sultan Salahuddin Abdul Aziz Shah Polytechnic is a registered Public Accredited Center, College and Polytechnic Education Department under code K21001. Until this guide was written, PB PSA offers ONE (1) MSC full certification programme, NINE (9) modular programmes and ONE (1) National Competency Standard (NCS) programme. While TEN (10) other polytechnics offer ONE (1) NCS program.

MALAYSIA SKILLS CERTIFICATION

Malaysian Skills Certification is one (1) of the main functions of the Skills Development Department (JPK). This certification offers five (5) certification levels, namely the Malaysian Skills Certificate from level 1 to level 3, the Malaysian Skills Diploma (DKM) level 4 and the Malaysian Advanced Skills Diploma level 5. The Malaysian Skills Certification can be obtained through three (3) methods, namely through training at a recognized institution (SLAPB), Industry Oriented Training (SLDN) and Prior Accreditation (PPT)

Malaysian Skills Certification provides a career path that is recognised by the industry and can produce skilled and qualified workers to enhance the competitiveness of the local industry in the world market. (Source: www.dsd.gov.my)

Abbreviation from National Occupational Skills Standard (NOSS). NOSS is a document that outlines the skills required by a skilled employee working in Malaysia for a certain field and job level and the path to achieving those skills. The main features of NOSS are based on job requirements according to the career structure in a certain job field created under Part IV of Act 652 and it is provided by industry experts and skilled workers who carry out the job. (Source: www.dsd.gov.my)



GUIDE FOR NOSS SELECTION





Polytechnics need to identify the appropriate NOSS titles to be mapped to the syllabus of a programme. The most important aspect is in terms of identifying the suitability of the field and credit hours of learning. NOSS titles can be identified by referring to the relevant sector, sub-sector, and occupational field. Each NOSS has COMPETENCY UNITS (CU) and WORK ACTIVITIES (WA) that need to be studied and understood so that mapping can be done according to the requirements of the NOSS. Polytechnics need to refer to the latest NOSS Register on the SDD website which is www.dsd.gov.my. Select the service section and then click on the National Occupational Skills Standard (NOSS) section as shown in Figure I.



Figure I : JPK Website

Scroll down until you find the NOSS List topic. Choose the latest NOSS..

3. Senarai NOSS

- 
[NOSS Yang Telah di Kaji Semula - kemaskini 1 Jun 2022](#)
- 
[Daftar Standard / Daftar NOSS Terkini - kemaskini 1 Jun 2022](#)
- 
[Senarai Pembangunan NOSS & OF Tahun 2022 - kemaskini 09 Februari 2022](#)
- 
[Belian NOSS](#)

4. Panduan dan Borang NOSS

Bil	Tajuk
1	Panduan Pengisian Borang Cadangan NOSS
2	Brosur Standard Kemahiran Pekerjaan Kebangsaan (NOSS)
3	Tatacara Pembelian NOSS

Figure 2 : NOSS List

The NOSS document contains a list of sectors, sub-sectors, and fields. Choose the NOSS that suits the programme to be implemented..

The use of NOSS needs to be understood first in terms of sector, sub-sector, and field codes. The code at the front provides the meaning of Sector/Section. Refer to **Figure 3**.

BIL/ NO	KOD/ CODE	SEKSYEN / SECTION
1	A	PERTANIAN, PERHUTANAN DAN PERIKANAN
2	B	PERLOMBONGAN DAN PENGKUARIAN
3	C	PEMBUATAN
4	D	BEKALAN ELEKTRIK, GAS, WAP DAN PENDINGIN UDARA
5	E	BEKALAN AIR; PEMBENTUNGAN, PENGURUSAN SISA DAN AKTIVITI PEMULIHAN
6	F	PEMBINAAN
7	G	PERDAGANGAN BORONG DAN RUNCIT, PEMBAIKAN KENDERAAN BERMOTOR DAN MOTOSIKAL
8	H	PENGANGKUTAN DAN PENYIMPANAN
9	I	PENGINAPAN DAN AKTIVITI PERKHIDMATAN MAKANAN DAN MINUMAN
10	J	MAKLUMAT DAN KOMUNIKASI
11	K	AKTIVITI KEWANGAN DAN INSURANS/TAKAFUL
12	L	AKTIVITI HARTANAH
13	M	AKTIVITI PROFESIONAL, SAINTIFIK DAN TEKNIKAL
14	N	AKTIVITI PENTADBIRAN DAN KHIDMAT

Figure 3 : Code & Section

For example, Section M: PROFESSIONAL, SCIENTIFIC, AND TECHNICAL ACTIVITIES

Then, find the same and required fields as the syllabus to be mapped..

Area	Pelukis Pelan Mekanikal / Mechanical Draughting
L5	MC-080-5:2013 Pengurusan Servis Pelukisan Pelan Mekanikal <i>Mechanical Draughting Services Management</i> (30-12-2013)
L4	MC-080-4:2013 Pentadbiran Servis Pelukisan Pelan Mekanikal <i>Mechanical Draughting Services Administration</i> (30-12-2013)
L3	MC-080-3:2013 Pelukisan Pelan Mekanikal <i>Mechanical Draughtsmanship</i> (19-12-94) (12-12-95) (25-10-10) (30-12-2013)
L2	Tiada Tahap (No Level)
L1	Tiada Tahap (No Level)

Figure 4 : Type of Area

For example, MC-080-3:2013 for Mechanical Plan Drawing (**Figure 4**). Once the appropriate NOSS has been identified, the purchase can be made by two methods, either online through the website <https://www.myspike.my/> or manually at the SDD headquarters.

Next, visit the Myspike portal page, click on the Training Institute Platform section (**Figure 5**).



Figure 5 : Training Platform

Find NOSS list button in **Figure 6**.

KEPADA INSTITUSI LATIHAN KEMAHIRAN

kurikulum latihan yang tepat dan memenuhi kehendak industri
 merekabentuk program latihan sepenuh masa atau customised sejajar dengan keperluan industri
 lebih jelas terhadap kemahiran yang diperlukan oleh industri
 uan latihan semula pengajar bagi memenuhi kehendak industri semasa
 g tepat boleh diberi dengan efektif kepada pelatih

etency Profile yang berkaitan boleh dilihat melalui pautan berikut.
 [Senarai NOSS](#)

Figure 6 : NOSS List Button

Search MC-080 Code (**Figure 7**).

Senarai NOSS			
Memaparkan 1-3 daripada 3 items.			
Bil	Kod NOSS	Tajuk / Nama NOSS	Tahap
	mc-080		Semua
1	MC-080-3:2013	Pelukisan Pelan Mekanikal	Tahap Tiga - 3
2	MC-080-4:2013	Pentadbiran Servis Pelukisan Pelan Mekanikal	Tahap Empat - 4
3	MC-080-5:2013	Pengurusan Servis Pelukisan Pelan Mekanikal	Tahap Lima - 5

Figure 7 : Noss Code

Click the rightmost part, which is the Competency Profile Chart (CPC) (**Figure 8**). The CPC contains the competency chart of the NOSS field. It includes sectors, sub-sectors, job areas, job levels and compulsory/CORE and optional/Elective competency units



0	Format NOSS	Lihat Terperinci
▼	Semua ▼	
	Baru - 1	 Competency Profile Chart (CPC)
	Baru - 1	 Competency Profile Chart

Figure 8 : Competency Profile Chart (CPC)

Each competency unit has a Job Description (JD) as shown in **Figure 9**.

Urutkan 1-6 daripada 6 items.

Competency	Tajuk Competency Unit (CU)
Semua ▼	
Core	MECHANICAL DRAWING SKETCHING
Core	MECHANICAL DRAWING DEVELOPMENT
Core	MECHANICAL DRAWING FILING
Core	COMPUTER AIDED DESIGN AND DRAFTING
Elektif	DRAFTING TRAINING AND DEVELOPMENT

Figure 9 : Core and CU

Click the Job Description section. The JD information (**Figure 10**), allows the polytechnic to determine suitability to be mapped to the selected syllabus.

JOB DESCRIPTION	
Job Description (JD)	
Competency	Core
Tajuk CU	MECHANICAL DRAWING SKETCHING
Penerangan CU	<p>Mechanical drawing sketching is the competency forms in addition of making annotations on dimensions of authority.</p> <p>Mechanical drawing sketching becomes a medium of communication in the field of mechanical engineering.</p> <p>Mechanical drawing sketching is the basic guide for the design and development of mechanical components.</p>

Figure 10 : Job Description

Once the NOSS fit has been identified and a decision has been made, the purchasing process begins. Users must first register a Myspike account if they want to purchase NOSS. Once registration is made, select the user section as shown in **Figure 11**.

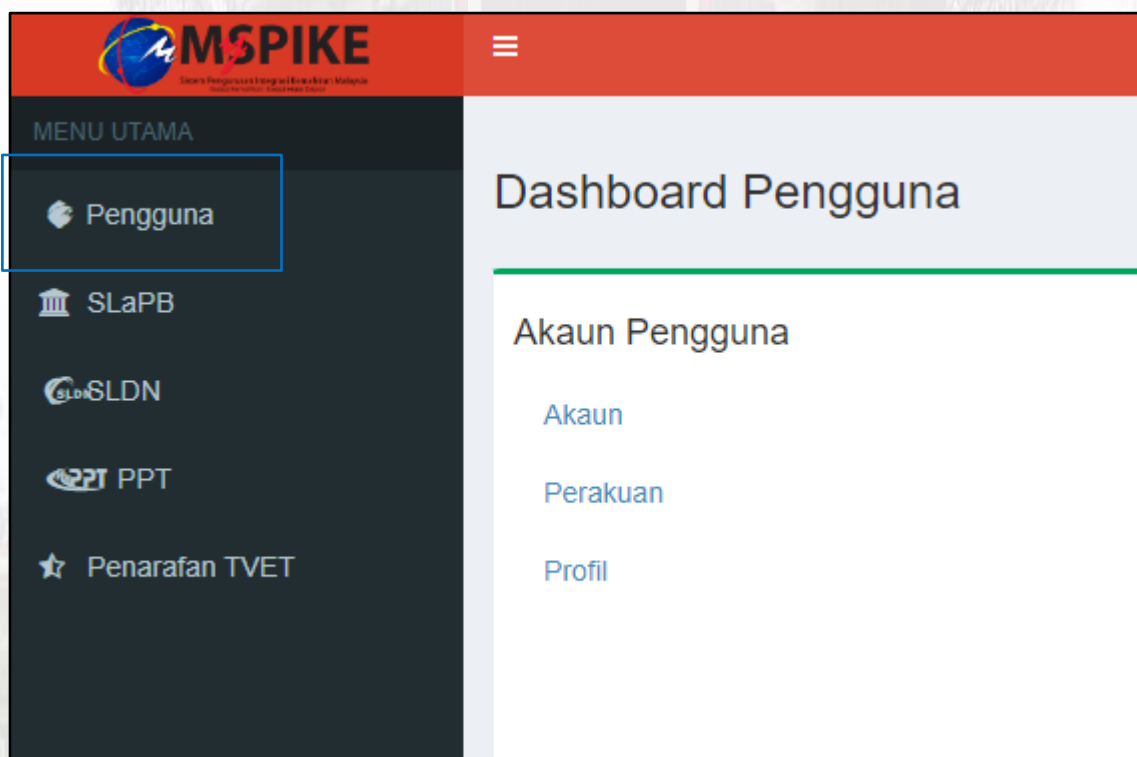
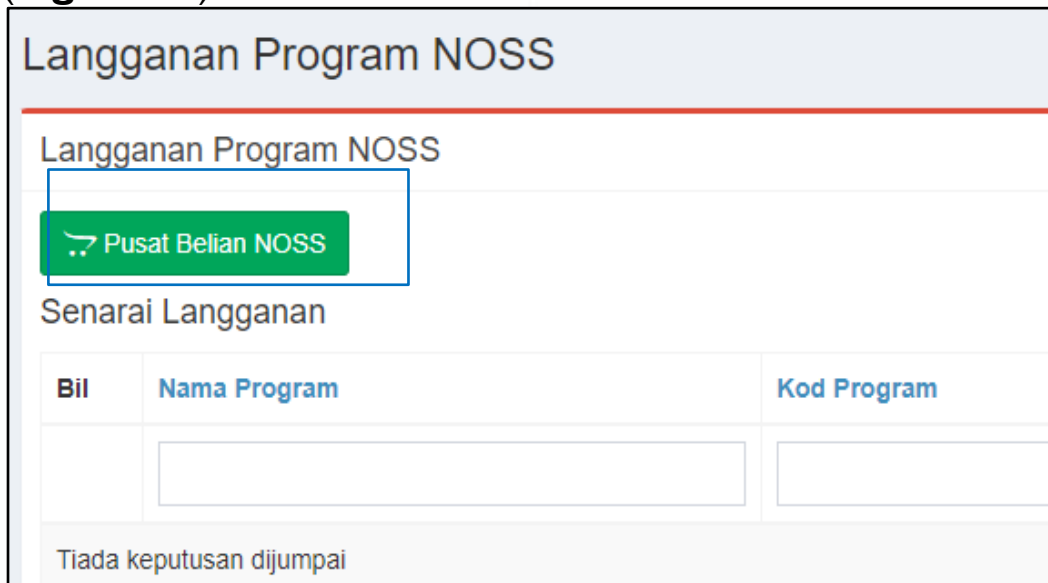


Figure 11 :User Dashboard

Next, find NOSS Cart.

Click NOSS purchase center and click new purchase (Figure 12).



Langganan Program NOSS

Langganan Program NOSS

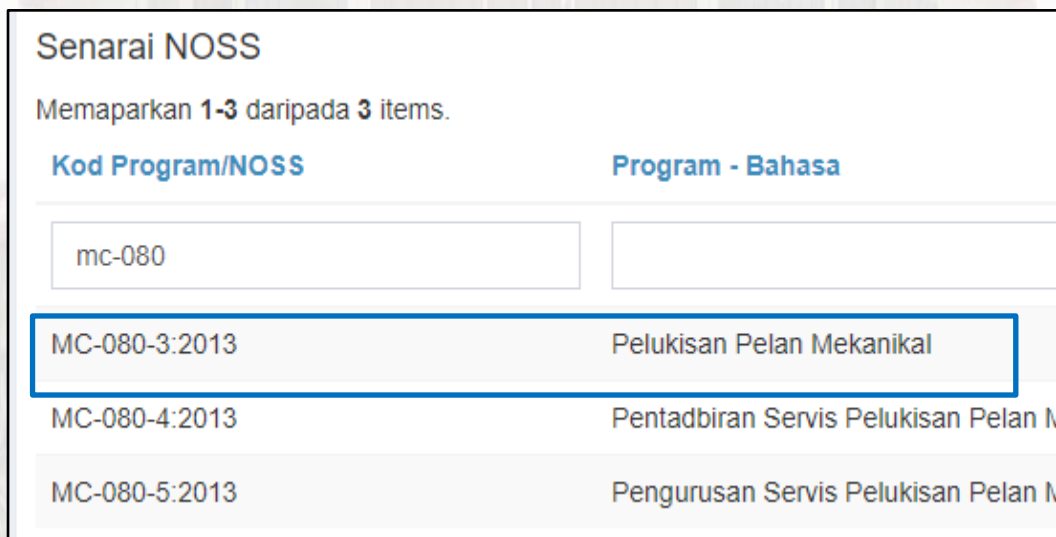
[➔ Pusat Belian NOSS](#)

Senarai Langganan

Bil	Nama Program	Kod Program

Tiada keputusan dijumpai

Figure 12 : NOSS Cart button



Senarai NOSS

Memaparkan 1-3 daripada 3 items.

Kod Program/NOSS	Program - Bahasa
mc-080	
MC-080-3:2013	Pelukisan Pelan Mekanikal
MC-080-4:2013	Pentadbiran Servis Pelukisan Pelan M
MC-080-5:2013	Pengurusan Servis Pelukisan Pelan M

Figure 13 : NOSS Program Code

Then, type the desired NOSS code, which is MC-080 (Figure 13).

Next, click the select section as shown in **Figure 14**.

Tahap		Pilihan
	Semua	
3		Pilih MC-080-3:2013
4		Pilih MC-080-4:2013
5		Pilih MC-080-5:2013

Figure 14 :NOSS Code Option

Once the selection is made, the NOSS will be added into the basket for the online payment process. The payment method can be done either through individual purchases through the Financial Process Exchange (FPX) service system or in bulk through local orders (LO) for government agencies. This purchased NOSS will be used for the mapping process..

MAPPING PROCESS

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MAPPING PROCESS

The inspection process is carried out to obtain confirmation of equivalence by JPK for programmes developed by agencies based on NOSS. The mapping process involves 2 categories, namely;

- ☐ First level mapping; Polytechnic
- ☐ Second level mapping; JPK, Field Specialist and Polytechnic

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MAPPING PROCESS

The first level mapping (I) only involves internal institutions consisting of Program Leaders, Departmental Curriculum Coordinators and Course Lecturers. The mapping process is as follows;

- ✓ Disposition of NOSS Title
- ✓ Mapping Preparation
- ✓ First Level Comparison (basic, sub topic)
- ✓ Second Level Comparison (detailed, content)
- ✓ Third Level Comparison (summary)
- ✓ Application for Mapping Approval to JPK

(Source: JPK, Programme Based Mapping Implementation Guidelines National Employment Skills Standards, 2015)

MAPPING PROCESS

The second level mapping (2) involves Officers from the Skills Development Department (JPK), Field Experts appointed by JPK and Polytechnic Staff consisting of Programme Leaders, Departmental Curriculum Coordinators and Course Lecturers. The mapping process is as follows;;

- ✓ First Stage of Mapping Document received by JPK
- ✓ Complete review by JPK
- ✓ First Stage Comparison (supporting document/ syllabus)
- ✓ Second Level Comparison (summary/ recommendation)
- ✓ Meeting of the Technical Committee (JKT) and the Evaluation and Recognition of Skills Qualification Committee (JPPKK)
- ✓ Mapping Results

(Source: JPK, Implementation Guidelines for Program Mapping Based on National Employment Skills Standards, 2015)

MAPPING PROCEDURE

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UNDERSTANDING NOSS

Before the initial process of mapping is done, 3 documents need to be prepared, namely;

- ✓ Programme syllabus
- ✓ NOSS to be mapped
- ✓ JPK/PEMETAAN/02 form

Before using the syllabus, polytechnics need to apply for permission to use the syllabus from the JPPKK headquarters first. After receiving written permission from the JPPKK headquarters, only then can the mapping process be carried out. This mapping guide will use 1 Work Activities (WA) NOSS MC-080-3:2013

Malaysian Skills Certificate in Mechanical Plan Drawing (**Figure 15**) and some course syllabus under the Mechanical Engineering Diploma programme. 1 WA mapping description is sufficient for other WA mapping processes to complete 1 competency unit / Competency Unit (CU).

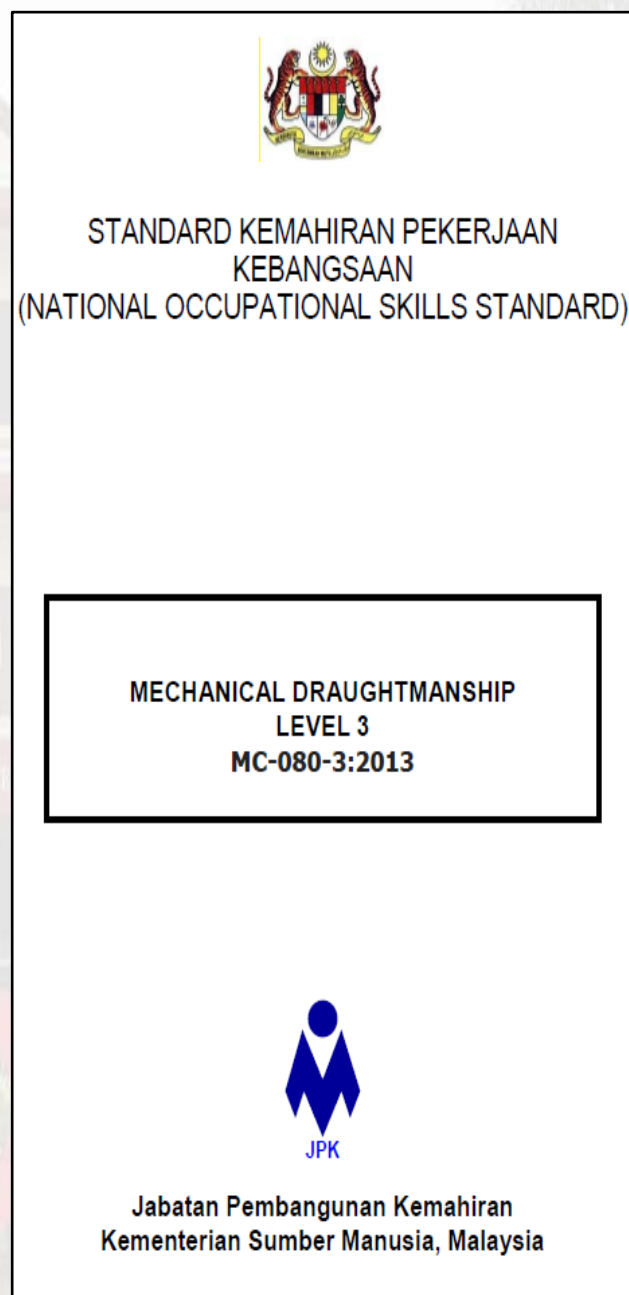


Figure 15 : Depan NOSS Cover Sample

UNDERSTANDING NOSS

To understand NOSS, the first step to refer to is the Competency Profile Chart (CPC). This competency chart (**Figure 16**) shows the overall/summary of the skills that need to be achieved. This CPC includes Competency Units for Core/Mandatory and Elective/options. In conclusion, there are 4 categories of accreditation, namely:

- ☐ Full SKM – All Competency Units (CU)
- ☐ Modular CU NOSS – ONE (1) Competence Unit (CU) or a combination of several CUs of the National Occupational Skills Standard (NOSS)
- ☐ Modular WA NOSS - ONE (1) Work Activity (WA) or a combination of several WAs coming from the same or different NOSS
- ☐ Modular NCS - National Skills Standards Program (NCS)

COMPETENCY PROFILE CHART (CPC)				
SECTOR	MACHINERY & EQUIPMENT			
SUB-SECTOR	MECHANICAL DRAUGHTING			
JOB AREA	MECHANICAL DRAUGHTING SUPPORT SERVICE			
NOSS TITLE	MECHANICAL DRAUGHTSMANSHIP			
JOB LEVEL	THREE (3)	JOB AREA CODE	MC-080-3:2013	
COMPETENCY	← COMPETENCY UNIT →			
CORE	MECHANICAL DRAWING SKETCHING	MECHANICAL DRAWING DEVELOPMENT	MECHANICAL DRAWING FILING	COMPUTER AID DESIGN AND DRAFTING
	MC – XXX-01	MC – XXX-02	MC – XXX-03	MC – XXX-04
ELECTIVE	DRAFTING TRAINING AND DEVELOPMENT	MECHANICAL DRAWING PRODUCTION SUPERVISION		
	MC – XXX-05	MC – XXX-06		

Figure 16 : CPC MC-080-3:2013

Competency Profile (CP) has detailed information of each Competency Unit. The information includes a complete description of the work/tasks that is required to fulfill the competency. Each has performance criteria that is measured to achieve the desired level. Refer **Figure 17**.

COMPETENCY PROFILE (CP)				
Sub Sector	MECHANICAL DRAUGHTING			
Job Area	MECHANICAL DRAUGHTING SUPPORT SERVICE			
NOSS Title	MECHANICAL DRAUGHTSMANSHIP			
Level	THREE (3)			
CU Title	CU Code	CU Descriptor	CU Work Activities	Performance Cr
1. Mechanical drawing sketching	MC-XXX-01	Mechanical drawing sketching is the competency in developing rough image without accurate scale that load shapes impressionism of objects, array, parts, idea and all shapes based on visual forms in addition of making annotations on dimension information	1. Examine mechanical drawing sketching instruction	1.1 Mechanical drawing sketching Instruction examined, instruction source checked, I authority checked, reporting checked. 1.2 Instruction direct defined, assigned objectives, assigned parameters checked 1.3 Instruction require

Figure 17 : Competency Profile (CP)

UNDERSTANDING NOSS

The new NOSS uses the terms Competence Unit (CU) and Work Activity (WA), while the old NOSS uses the terms Responsibility/ Duty and Work/ Task. However, the function of both is the same. This guide will use the new NOSS. In order to achieve a complete skill, all competency units must be achieved, whereas in order to achieve each unit of competence, all work activities must be carried out. The image is as shown in **Figure 18**. If there is a schedule of student learning time (SLT) and Course Syllabus in the syllabus, then NOSS also has such information called as Curriculum of Competency Unit (COCU). These three (3) pieces of information will be used during the mapping process. At the end of the mapping, both the syllabus and NOSS achieve the learning outcomes or Learning Outcomes (LO) set.



Figure 18 : SKM Process

The difference between COCU (**Figure 19**) and SLT (**Figure 20**) is as shown in the figure below:

CURRICULUM OF COMPETENCY UNIT (CoCU)								
Sub Sector	MECHANICAL DRAUGHTING							
Job Area	MECHANICAL DRAUGHTING SUPPORT SERVICE							
NOSS Title	MECHANICAL DRAUGHTSMANSHIP							
Competency Unit Title	MECHANICAL DRAWING SKETCHING							
Learning Outcomes	<p>The person who is competent in this CU shall be able to produce free hand sketches that could describe appearance and or any other parts, layout and its surroundings, exists or not yet exist, well defined point of view suitable rough scale by entering dimension, required information on site and other information according to needs and or that had been clearly established, may be used as reference materials in the technical drawing preparation and medium of communication that is understandable by other parties. Upon completion of competency unit, trainees will be able to :</p> <ul style="list-style-type: none">• Examine mechanical drawing sketching instruction .• Prepare mechanical drawing sketching requirements.• Perform mechanical drawing Sketching planning.• Perform mechanical drawing sketching• Prepare mechanical drawing sketching record.							
Competency Unit ID	MC-XXX-1	Level	3	Training Duration	80 Hours	Credit Hours	8	
Work Activities	Related Knowledge	Related Skills		Attitude/Safety/ Environmental		Training Hours	Delivery Mode	Assessment Criteria
1.Examine mechanical drawing sketching	i. Mechanical drawing Sketching Instruction ii. Instruction Source <ul style="list-style-type: none">• Check Line of authority						Lecture	• Mechanical drawing Sketching Instruction

Figure 19 : COCU Example

DISTRIBUTION OF STUDENT LEARNING TIME (SLT):									
Course Content Outline	CLO*	Teaching and Learning Activities							SLT
		Guided Learning (F2F)				Guided Learning (NF2F) eg: e-Learning	Independent Learning (NF2F)		
		L	P	T	O				
1.0 INTRODUCTION TO CAD									
1.1 Explain the configuration of 3D project.	CLO1	0.5	0	0	0	0	0	0.55	1.05
1.2 Apply getting started of 3D modelling.	CLO1	0.5	0	0	0	0	0	0.55	1.05
1.3 Explains started of 3D modeling Environment and model manipulation	CLO2	0	1	0	0	0	0	1	2

Figure 20 : SLT Example

UNDERSTANDING NOSS

Each work activity (VA) has knowledge, skills, and attitudes/safety. Knowledge refers to the theory of learning, while skill refers to practice. Both have a training period that needs to be implemented to complete the process of the work activity. The training period available at NOSS includes independent learning/NF2F. **Figure 21** shows the fourth Competency unit of NOSS MC-080- 03:2013. MC stands for field sector, while 080 represents the Mechanical Plan Drawing sub sector/area. 03 is the SKM level, while 2013 is the year the NOSS was issued. The fourth Competency Unit for this NOSS is Computer Aided Design and Drafting (CADD) - CU ID MC-xxx-4. No.4 enters the fourth CU.

CURRICULUM OF COMPETENCY UNIT (CoCU)							
Sub Sector	MECHANICAL DRAUGHTING						
Job Area	MECHANICAL DRAUGHTING SUPPORT SERVICE						
NOSS Title	MECHANICAL DRAUGHTSMANSHIP						
Competency Unit Title	COMPUTER AIDED DESIGN AND DRAFTING (CADD)						
Learning Outcome	<p>The person who is competent in this CU shall be able to produce clean and precise mechanical drawing of existing or non-existing object and or any parts of it, sectional views, detail assemblies and or sub-assemblies, its layout, in two and or three dimension, using symbols and methodology that comply with specified standards, at a clear view angle, using a suitable accurate scale, drawn in an accurate manner, providing objects information as required and or specified, using a specified computer aided design software, neatly and clearly printed or plotted, with the end product could be confidently referred and understood and effective communication media by any parties in accordance with organizational requirement. Upon completion of this competency unit, trainees will be able to:</p> <ul style="list-style-type: none"> • Prepare CADD software and requirements • Perform CADD application systems installation • Perform CADD two dimensional Mechanical Drawing development • Perform CADD three dimensional Mechanical Drawing development • Perform CADD two dimensional assembly drawing development • Perform CADD three dimensional assembly drawing development • Prepare CADD operation report. 						
Competency Unit ID	MC-XXX-4	Level	3	Training Duration	320 Hours	Credit Hours	

Figure 21 : COCU CADD Example

MAPPING PROCESS

The mapping process needs to be proven by using a form **JKP/PEMETAAN/02**.

<p style="text-align: center;">NOSS MC-080-3:2013</p>		WA/TASK OUTLINE			
		NO. WA/TASK			
		CU/DUTY			
		TAHAP			
PIK	SUB MODUL				

Figure 22 : Top of Form 02

The first step that needs to be done is to fill in the line cell section which is WA/Task Outline. Enter the title of each work activity on the WA/Task Outline section (**Figure 23**).

<p style="text-align: center;">NOSS MC-080-3:2013</p>		WA/TASK OUTLINE	Prepare CADD software and requirements	Perform CADD application systems installation	Perform CADD two dimensional Mechanical Drawing development	Perform CADD three dimensional Mechanical Drawing development	Perform CADD two dimensional assembly Drawing development	Perform CAD three dimensional assembly drawing development
		NO. WA/TASK	4.1	4.2	4.3	4.4	4.5	4.6
		CU/DUTY	4.0 COMPUTER AIDED DESIGN AND DRAFTING					
		TAHAP	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3
KOD KURSUS	TOPIK	SUB MODUL						
	1.0 INTRODUCTION TO TECHNICAL DRAWING	1.1 Explain the purpose of technical drawing 1.2 Explain the types of symbols in engineering drawing 1.3 Mechanical Sketching						
	2.0 GEOMETRICAL DRAWING	2.1 Explain basic geometrical drawing 2.2 Construct basic geometrical drawing 2.3 Geometrical Sketching						
		3.1 Explain an orthographic projection 3.2 Construct an orthographic projection drawing according						

Figure 23 : Task Area

MAPPING PROCESS

As seen in **Figure 24**, No. WA 4.1, 4.2 and so on are by referring to NOSS. For example, if 4.1, 4 represents the 4th CU and I represents the first WA.

	• Prepare CADD operation report.			
Competency Unit ID	MC-XXX-4	Level	3	Training Duration
Work Activities	Related Knowledge	Related Skills	Attitude/Environment	
123				

Figure 24 : Competency Unit ID

MAPPING PROCESS

Hence, the WA/TASK Outline section will use the title WA 4.1 in **Figure 25** (Prepare CADD Software and requirements). In the CU/DUTY section, enter the 4th CU title (COMPUTER AIDED DESIGN AND DRAFTING). The cell section of this row represents NOSS information.

WA/TASK OUTLINE	Prepare CADD software and requirements	Perform CADD application systems installation	Perform CADD two dimensional Mechanical Drawing development	Perform CADD three dimensional Mechanical Drawing development	Perform CADD two dimensional assembly Drawing development	Perform dim as d dev
NO. WA/TASK	4.1	4.2	4.3	4.4	4.5	
CU/DUTY	4.0 COMPUTER AIDED DESIGN AND DRAFTING					
TAHAP	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	T

Figure 25 : WA Information

MAPPING PROCESS

Next is the filling of the cell section of the column (**Figure 26**). The cell section of this column represents the course syllabus information to be mapped. Enter the course title in the Course/Module/Subject section. The course code uses the course code used in the syllabus. Enter course topics and sub-topics in the Topics and Sub Modules section. Refer **Figure 27**.

Course Content Outline	CLO
1.0 INTRODUCTION TO TECHNICAL DRAWING	
1.1 Explain the purpose of technical drawing	CLO
1.2 Explain the types of symbols in engineering drawing	CLO
2.0 GEOMETRICAL DRAWING	
2.1 Explain basic geometrical drawing	CLO

Figure 26 : Silibus Part

KURSUS/ MODUL/SUBJEK	KOD KURSUS	TOPIK	SUB MODUL
Engineering Drawing	DJJ10013	1.0 INTRODUCTION TO TECHNICAL DRAWING	1.1 Explain the purpose of technical drawing 1.2 Explain the types of symbols in engineering drawing 1.3 Mechanical Sketching
		2.0 GEOMETRICAL DRAWING	2.1 Explain basic geometrical drawing 2.2 Construct basic geometrical drawing 2.3 Geometrical Sketching
		3.0 ORTHOGRAPHIC PROJECTION AND	3.1 Explain an orthographic projection 3.2 Construct an orthographic projection

Figure 27 : Courses, Topic & Sub Modul Area

MAPPING PROCESS

Enter all the course topics and sub-topics that are on the course syllabus in the topic and sub-module sections first. The purpose is to ensure that each topic or sub-topic of the course is not overlooked for the mapping process. This mapping form 02 is designated as the basic level for initial screening to ensure which sub-topics are suitable to be taken to the next, more detailed level. If this WA 4.1 involves / is related / appropriate to be mapped with 4 course syllabuses, then all 4 course syllabuses (courses, topics & sub-modules) must be in the cell section of the column. The next process is to map each sub-topic related to each WA by creating markings as shown in **Figure 28**.

		NO. WA/TASK	4.1	4.2	4.3
		CU/DUTY	4.0 COM		
		TAHAP	TAHAP 3	TAHAP 3	TAHAP
TOPIK	SUB MODUL				
6.0 COMPUTER AIDED DESIGN (CAD)	6.1 Explain Computer Aided Design (CAD).				
7.0 CREATING	7.1 Explain creating drawing				
	7.2 Apply coordinate system and entry.				
	7.3 Apply drawing tools and setting				
	7.4 Apply drawing aids in producing the drawing				
	7.5 Apply drawing view using display				

Figure 28 : Mapping Mark

Engineering Drawing course, sub module 6.1 is suitable to be mapped with WA 4.1, while sub modules 1 & 7-8 are suitable to be mapped with WA 4.3. This level of filtering only involves sub topics and WA only.

MAPPING PROCESS

Figure 29 shows an overview of the mapping involving I CU with the first module.

NOSS MC-080-3:2013 RAM POLITEKNIK SULTAN N ABDUL AZIZ SHAH- DIPLOMA MECHANICAL ENGINEERING				WAKTAS K OUTLINE	Prepare CADD software and requireme nts	Perform CADD applicatio n systems installatio n	Perform CADD two dimensional Mechanical Drawing developmen t	Perform CADD three dimensional Mechanical Drawing developmen t	Perform CADD two dimensional assembly Drawing developmen t	Perform CADD three dimensional assembly drawing developmen t	Pre CA oper rep
				NO VAFTA	4.1	4.2	4.3	4.4	4.5	4.6	4
				CUKUTY	4.0 COMPUTER AIDED DESIGN AND DRAFTING						
				TAHAP	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAH
RSUS/ MODUL/SUBJEK	KOD KURSUS	TOPIK	SUB MODUL								
Engineering Drawing	DUJ10013	1.0 INTRODUCTION TO TECHNICAL DRAWING	1.1 Explain the purpose of technical drawing 1.2 Explain the types of symbols in engineering drawing 1.3 Mechanical Sketching								
		2.0 GEOMETRICAL DRAWING	2.1 Explain basic geometrical drawing 2.2 Construct basic geometrical drawing 2.3 Geometrical Sketching								
		3.0 ORTHOGRAPHIC PROJECTION AND ISOMETRIC	3.1 Explain an orthographic projection 3.2 Construct an orthographic projection drawing according to standard 3.3 Explain an isometric drawing 3.4 Construct an isometric drawing according to standard								
		4.0 GEOMETRIC DIMENSIONING AND TOLERANCE	4.1 Explain the geometric dimensioning for technical drawing 4.2 Explain the tolerance for technical								
		5.0 SECTIONAL VIEW	5.1 Explain sectioning for technical drawing 5.2 Construct a sectional view drawing according to standard 5.3 Mechanical drawing filing (Manual) 5.4 Bill Of Materials								
		6.0 COMPUTER AIDED DESIGN (CAD)	6.1 Explain Computer Aided Design (CAD)								
		7.0 CREATING DRAWING	7.1 Explain creating drawing 7.2 Apply coordinate system and entry 7.3 Apply drawing tools and setting 7.4 Apply drawing aids in producing the drawing 7.5 Apply drawing view using display control 7.6 Apply modify tools for modifying parts of drawing 7.7 Apply object selection 7.8 Propose a project report with following								
		8.0 ANNOTATION AND DRAWING ORGANIZATION	8.1 Explain the annotation in drawing 8.2 Apply the basic dimensioning in drawings 8.3 Apply usage of text in drawing 8.4 Explain the drawing organization 8.5 Apply layer to organize object in drawing 8.6 Apply inquiry commands 8.7 Propose a project report with following engineering norms and practices in engineering drawing								
		9.0 ORTHOGRAPHIC AND ISOMETRIC	9.1 Explain the orthographic and isometric 9.2 Apply orthographic projection 9.3 Apply isometric drawing 9.4 Propose a project report with following engineering norms and practices in engineering drawing								

Figure 29 : Description of Mapping I Module

MAPPING PROCESS

Figure 30, shows an overview of the mapping involving I CU with 3 modules.

NOSS MC-080-3:2013 PROGRAM POLITEKNIK SULTAN DIN ABDUL AZIZ SHAH- DIPLOMA MECHANICAL ENGINEERING				WATAS K' OUTLINE	Prepare CADD software and requireme nts	Perform CADD applicatio n systems installatio n	Perform CADD two dimensional Mechanical Drawing developmen t	Perform CADD three dimensional Mechanical Drawing developmen t	Perform CADD two dimensional assembly Drawing developmen t	Perform CADD three dimensional assembly drawing developmen t	Prepare CADD operation report.
				NO WANTA CUDU TY	4.1	4.2	4.3	4.4	4.5	4.6	4.7
				TAHAP	4.0 COMPUTER AIDED DESIGN AND DRAFTING						
KURSUS/ MODUL/SUBJEK	KOD KURSUS	TOPIK	SUB MODUL	TAHAP	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3	TAHAP 3
Engineering Drawing	DJJ10013	8.0 ANNOTATION AND DRAWING ORGANIZATION	8.1 Explain the annotation in drawing								
			8.2 Apply the basic dimensioning in drawings								
			8.3 Apply usage of text in drawing								
			8.4 Explain the drawing organization								
			8.5 Apply layer to organize object in drawing								
Engineering Drawing	DJJ10013	9.0 ORTHOGRAPHIC AND ISOMETRIC	8.6 Apply inquiry commands								
			8.7 Propose a project report with following engineering norms and practices in engineering drawing								
			9.1 Explain the orthographic and isometric								
			9.2 Apply orthographic projection								
			9.3 Apply isometric drawing								
Engineering Drawing	DJJ10013	10.0 HATCHING OBJECT AND REUSABLE CONTENT	9.4 Propose a project report with following engineering norms and practices in engineering drawing								
			10.1 Explain the Hatching object and reusable content								
			10.2 Apply the hatching command in drawing								
			10.3 Apply Reusable Content								
			10.4 Propose a project report with following engineering norms and practices in engineering drawing								
Engineering Drawing	DJJ10013	11. PLOTTING	10.5 Mechanical drawing filling (Digital)								
			11.1 Explain the plotting in CAD								
			11.2 Apply drawing view in paper space								
			11.3 Apply control for entities in paper space.								
			11.4 Apply configuration set up for plotter								
Aided Design	DJJ30122	1.0 INTRODUCTION TO CAD	11.5 Propose a project report with following engineering norms and practices in engineering drawing								
			11.6 Mechanical drawing filling (Digital)								
			1.1 Explain the configuration of 3D project.								
			1.2 Apply getting started of 3D modelling.								
			1.3 Explains started of 3D modeling Environment and model manipulation								
Aided Design	DJJ30122	2.0 SKETCHING TECHNIQUES	2.1 Apply sketch tools to produce 2D sketch geometry.								
			2.2 Explains started of 3D modeling Environment and model manipulation								
			2.3 Choose the suitable constraints in parametric sketches.								
			3.1 Construct part feature and shape design.								
			3.2 Constructs part features and shape design on part modelling using proper technique and tools								
Aided Design	DJJ30122	3.0 PART FEATURES	3.3 Apply work features.								
			3.4 Constructs geometry or part modelling using work plane, work axis and work point.								
			3.5 Construct the detail shape design or ..								
Workshop Practice 4	DJJ40142	1. High Precision Machining	1.1 Explain the configuration of 3D project.								
			1.2 Apply getting started of 3D modelling.								
			1.3 Explains started of 3D modeling Environment and model manipulation								
			2.1 Apply sketch tools to produce 2D sketch geometry.								
			2.2 Explains started of 3D modeling Environment and model manipulation								
Workshop Practice 4	DJJ40142	2. Computer Numerical Control Machines (CNC) And Machining Software	2.3 Choose the suitable constraints in parametric sketches.								
			3.1 Construct part feature and shape design.								
			3.2 Constructs part features and shape design on part modelling using proper technique and tools								
			3.3 Apply work features.								
			3.4 Constructs geometry or part modelling using work plane, work axis and work point.								
Workshop Practice 4	DJJ40142	2. Computer Numerical Control Machines (CNC) And Machining Software	3.5 Construct the detail shape design or ..								
			Create basic part modeling: basic modeling, terminology, choosing the best profile								
			choosing the sketch plane, details of the part base feature, sketch on a planar face, cut feature, using the hole wizard, view options filletting, detailing basics, drawing views center marks, dimensioning and								

Figure 30 : Description of Mapping 3 Modules

PSA

Figure 3I : Overview of CU Mapping

[illegible]

MAPPING PROCESS

The next stage is a more detailed mapping involving course content with WA content. This level will determine whether it is suitable to be mapped or not. Two (2) categories will be referred to for this stage, namely the content of knowledge and skills and the duration of training/SLT. This detailed stage is done using the JPK/PEMETAAN/03 form. This stage involves a comparison between the COCU NOSS and the Course Syllabus/SLT. Refer **Figure 32**.

DUL: 4.0 COMPUTER AIDED DESIGN AND DRAFTING							
CURRICULUM OF COMPETENCY UNIT (COCU)/ TASK PROFILE				KURIKULUM PROGRAM AGensi			
Activities (Task)	Related Knowledge/ Knowledge of	Applied Skills / Related Skills / Ability to	Training Duration	Module	Knowledge	Applied Skills	Training D

Figure 32 : Comparison of COCUVS Syllabus

MAPPING PROCESS

This detailed section involves knowledge, skills, and training period. However, it is recommended that ONE (1) additional line cell section be added for the purpose of recording knowledge or skills that are not on the syllabus (**Figure 33**). This post (only polytechnic reference, the original format is used for JPK level) will be used to make additional training/ finishing school for the purpose of meeting the knowledge, skills and training hours set by each WA.

KURIKULUM PROGRAM AGENSI					
<i>Module</i>	<i>Knowledge</i>	<i>Applied Skills</i>	<i>Training Duration</i>	<i>Additional Courses / Finishing School</i>	

Figure 33 : Syllabus Mapping Area

MAPPING PROCESS

Referring to the basic mapping example from Mapping form 02, sub topic 7 is appropriately mapped to WA 4.3. So, based on COCU, WA content 4.3 is shown in **Figure 34**.

Work Activities	Related Knowledge	
3. Perform CADD two dimensional Mechanical Drawing development	i. Examine Mechanical Drawing instruction <ul style="list-style-type: none"> • instruction source • instruction authority • instruction validity • instruction requirements 	

CU/MODUL: 4.0 COMPUTER AIDED DESIGN AND DRAFTING	
CURRICULUM OF COMPETENCY UNIT	
Work Activities (WA)/Task	Related Knowledge / Knowledge of
4.3 Perform CADD two dimensional Mechanical Drawing development	i. Examine Mechanical Drawing instruction <ul style="list-style-type: none"> ▫ instruction source ▫ instruction authority ▫ instruction validity ▫ instruction requirements ▫ Assignment objectives ii. CADD mechanical drawing requirements

Figure 34 : Linking COCUVs Mapping

Enter the related knowledge available in the COCU NOSS in the cell section of the related knowledge line.

MAPPING PROCESS

Then, enter Related Skills from COCU NOSS into the cells of the related skills row (**Figure 35**) after the related knowledge column.


CURRICULUM OF COMPETENCY UNIT (COCU)/ TASK PROFILE		
Related Knowledge / Knowledge of	Applied Skills / Related Skills / Ability to	Training Duration
i. Examine Mechanical Drawing instruction ▢ instruction source ▢ instruction authority ▢ instruction validity ▢ instruction requirements ▢ Assignment objectives ii. CADD mechanical drawing requirements		20
	i. Examine Mechanical Drawing instruction ii. Obtain CADD mechanical drawing requirements iii. Determine Mechanical Drawing CADD Scale and dimension. iv. Develop CADD plan elevation v. Develop CADD side and end elevation vi. Prepare CADD Mechanical Drawing dimensions	108

Figure 35 :Related Skills Area

Enter the training period by referring to COCU NOSS. Some NOSS do not have a training period at each WA. The training period given only specifies the number of competency unit (CU) hours. If this happens, the course lecturer needs to determine the appropriate distribution of hours for each WA. For the example above, the duration of hours is determined by the expert lecturer since the hours per WA for this CU are not specified.

MAPPING PROCESS

The next process is to fill in the course syllabus (**Figure 36**).


KURIKULUM PROGRAM AGensi		
Module	Knowledge	Applied Skills
DJJ10013 - Engineering Drawing	1.1 Explain the purpose of technical drawing 1.2 Explain the types of symbols in engineering drawing 7.1 Explain creating drawing 8.1 Explain the annotation in drawing 8.4 Explain the drawing organization	
		7.2 Apply coordinate system and entry. 7.3 Apply drawing tools and setting 7.4 Apply drawing aids in producing the drawing 7.5 Apply drawing view using display control

Figure 36 : Syllabus Mapping Area

Course lecturers need to distinguish between knowledge/theory and skills/practice. After filling in the knowledge and skills space, calculate the training period for theory and practice considering independent learning (NF2F). Hour duration is calculated by referring to the SLT on the syllabus (**Figure 37**).

Guided Learning (F2F)				Guided Learning (NF2F) eg: e-Learning	Independent Learning (NF2F)	SLT
L	P	T	O			
0.5	0	0	0	0	0.25	0.75
0.5	0	0	0	0	0.25	0.75

Figure 37 : SLT Training Period Section

MAPPING PROCESS

A mapping comparison can be seen in **Figure 38**.

Related Knowledge / Knowledge of	Applied Skills / Related Skills / Ability to	Training Duration	Module	Knowledge	Applied Skills	Training Duration
Examine Mechanical Drawing instruction □ instruction source □ instruction authority □ instruction validity □ instruction requirements		20	DJJ10013 - Engineerin g Drawing DJJ30122 - CADD	1.1 Explain the purpose of technical drawing 7.1 Explain creating drawing 8.1 Explain the		40
	i. Examine Mechanical Drawing instruction ii. Obtain CADD mechanical drawing requirements iii. Determine Mechanical Drawing CADD Scale and dimension.	108	DJJ10013 - Engineerin g Drawing DJJ30122 - Computer Aided Design DJJ40182 - Project 1		7.3 Apply drawing tools and setting and practices in engineering drawing 8.2 Apply the basic dimensioning in drawings 8.3 Apply usage of text in drawing	150

Figure 38 : Mapping Comparison

Based on the diagram above, mapping does not only involve 1 course, but also involves multiple courses (under the same program), as a result from Mapping Form 02. Therefore, in the notes section, state 100% fulfilled (**Figure 39**).

KURIKULUM PROGRAM AGensi					CATATAN
	Knowledge	Applied Skills	Training Duration	Additional Courses/ Finishing School	
3 - erin ng 22 -	1.1 Explain the purpose of technical drawing 7.1 Explain creating drawing		40		100% Cover

Figure 39 : Notes Area

MAPPING PROCESS

For WA that cannot be met, meaning it is not in the course syllabus, then state whether the knowledge or skills are not in the course in the Additional Courses/Finishing School section.

CURRICULUM OF COMPETENCY UNIT (COCU)/ TASK PROFILE			
Work Activities (WA)/Task	Related Knowledge / Knowledge of	Applied Skills / Related Skills / Ability to	Training Duration
4.2 Perform CADD application systems installation	i. CAD software Installation instruction and requirements. ▫ Hardware requirements ▫ Software requirements ▫ Licensing requirements ii. CAD installation planning ▫ CAD installation objectives. ▫ CAD installation time frame ▫ CAD installation tools, equipments & materials.		3
		i. Examine CAD Software installation instruction and requirements. ii. Examine CAD hardware installation manual and requirements. iii. Examine CAD Installation	5

Figure 40 : Knowledge, Skills, and Training Duration of COCU Area

Figure 40 shows the knowledge and skills and duration of Training for COCU WA 4.2

MAPPING PROCESS

Figure 4I shows part of the polytechnic syllabus. There are THREE (3) out of SIX (6) knowledge work activities that are not on the syllabus. So, the three work activities need to be included in the Additional Courses/Finishing School space for TWO (2) hours of training, whereas in the field of Applied Skills, there is no syllabus that can meet the desired COCU. Therefore, it is necessary to enter the COCU that is not in the Additional Courses/Finishing School field along with the original training period of the work activity.

KURIKULUM PROGRAM AGensi					
Module	Knowledge	Applied Skills	Training Duration	Additional Courses/ Finishing School	Add Training
J10013 - Engineering Drawing J30122 - Computer Aided Design JJ40142 - Mechanical Workshop	12.1. Explain Computer Aided Design (CAD). a. Differences between conventional drawing with CAD. b. CAD system and its components. c. CAD User Interface navigation / interaction		1	ii. CAD installation planning -CAD installation objectives. -CAD installation time frame -CAD installation tools, equipments & materials.	2
J10013 - Engineering Drawing J30122 - Computer Aided Design JJ40142 - Mechanical Workshop		NONE		i. Examine CAD Software installation instruction and requirements. ii. Examine CAD hardware installation manual and requirements. iii. Examine CAD Installation requirements	5

Rajah 4I : Increase in Training Period

MAPPING PROCESS

The full image is as shown in **Figure 42:**

CURRICULUM OF COMPETENCY UNIT (COCU)/ TASK PROFILE				KURIKULUM PROGRAM AGensi						CATATAN
Work Activities (WA)/Task	Related Knowledge / Knowledge of	Applied Skills / Related Skills / Ability to	Training Duration	Module	Knowledge	Applied Skills	Training Duration	Additional Courses/ Finishing School	Add Training Duration	
2 Perform CADD application systems installation	i. CAD software Installation instruction and requirements. ii. Hardware requirements iii. Software requirements iv. Licensing requirements v. CAD installation planning vi. CAD installation objectives. vii. CAD installation time frame viii. CAD installation tools, equipments & materials.		3	UU10013 - Engineering Drawing DUJ30122 - Computer Aided Design DUJ40142 - Mechanical Workshop	12.1. Explain Computer Aided Design (CAD). a. Differences between conventional drawing with CAD. b. CAD system and its components. c. CAD User Interface navigation / interaction		1	ii. CAD installation planning -CAD installation objectives. -CAD installation time frame -CAD installation tools, equipments & materials.	2	100% Co
		i. Examine CAD Software installation instruction and requirements. ii. Examine CAD hardware installation manual and requirements. iii. Examine CAD Installation requirements. iv. Plan CAD installation Perform CAD Installation.	5	UU10013 - Engineering Drawing DUJ30122 - Computer Aided Design DUJ40142 - Mechanical Workshop		NONE		i. Examine CAD Software installation instruction and requirements. ii. Examine CAD hardware installation manual and requirements. iii. Examine CAD Installation requirements. iv. Plan CAD installation Perform CAD Installation.	5	100% Co

Figure 42 : Differences in Training Period

MAPPING PROCESS

After completing the mapping process, the bottom of the Mapping 02 form will display the total number of hours (**Figure 43**) for the course syllabus space.

DJJ10013 - Engineering Drawing DJJ30122 - Computer Aided Design DJJ40182 - Project 1 DJJ50193 - Project 2 DJJ40173 - Engineering Design		i. Propose a project report with following engineering norms and practices in engineering drawing ii Create basic part modeling; basic modeling, terminology, choosing the best profile choosing the sketch plane, details of the part base feature, sketch on a planar face, cut	40
TOTAL TRAINING DURATIONS (HOURS)			260

Figure 43 : Total Training Hours

Based on the example above, a total of 260 hours (81.3%) of the training period was successfully mapped from the course syllabus for the 4th CU, compared to the NOSS regulation which requires 320 hours of training period (Figure 44). There are three categories of mapping percentage assessments, namely Fully Fulfilled (100%), Partially Fulfilled (>70%) and Not Fulfilled (<70%).

Competency Unit Title	COMPUTER AIDED DESIGN AND DRAFTING (CADD)					
Learning Outcome	The person who is competent in this CU shall be able to produce clean and precise n existing or non-existing object and or any parts of it, sectional views, detail assemblies hidden parts, its layout, in two and or three dimension, using symbols and methodology specified standards, at a clear view angle, using a suitable accurate scale, drawn in providing objects information as required and or specified, using a specified computer a software, neatly and clearly printed or plotted, with the end product could be confidently understandable and effective communication media by any parties in accordance with org Upon completion of this competency unit, trainees will be able to:					
Competency Unit ID	MC-XXX-4	Level	3	Training Duration	320 Hours	Credit Hou

Figure 44 : CU CADD Training Period

MAPPING PROCESS

After meeting the requirements of Mapping Forms 02 and 03, the next stage is to fill in JPK/Mapping/04-A Form (**Figure 45**). This form includes the formulation for the mapping process on Mapping Form 03.

BORANG RUMUSAN PENILAIAN PEMETAAN PROGRAM SILIBUS AGENSI BERDASARKAN STANDARD KEMAHIRAN PEKERJA							
NAMA AGENSI : POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH (PSA) NAMA PROGRAM AGENSI : DIPLOMA KEJURUTERAAN MEKANIKAL KOD PROGRAM AGENSI : DKM							
NAMA NOSS : PELUKIS PELAN MEKANIKAL KOD NOSS : MC-080-3:2013							
CU/DUTY	BIL WORK ACTIVITY (WA)/TASK (A)	BIL WA/TASK DIPENUHI (B)	% WA/TASK DIPENUHI [(B/A)*100]	NAMA WA/TASK TIDAK DIPENUHI	TEMPOH LATIHAN (JAM)		ULASAN PANEL JAWATANKU PENILAIAN PEMETAAN PROGI KEMAHIRAN
					SKPK (NOSS)	KURIKULUM AGENSI	
CU 4	7	7	100%	TIADA	320	260	
JUMLAH % KESELURUHAN			100%	JUMLAH JAM	320	260	
ELEMEN	BIL ABILITY (A)	BIL ABILITY DIPENUHI (B)	% ABILITY DIPENUHI [(B/A)*100]	NAMA ABILITY TIDAK DIPENUHI	TEMPOH LATIHAN (JAM)		CADANGAN JAWATANKUAS PEMETAAN
					SKPK (NOSS)	KURIKULUM AGENSI	

Figure 45 : Mapping Form 04-A

The diagram above only involves the formulation of ONE (1) CU only. If the polytechnic wants to run a modular programme, it is sufficient with only ONE (1) Competency Unit (CU) or some combination/ ONE (1) Work Activity (WA) as explained before. If referring to the Mapping form 04, there is a box space for filling in Core Abilities elements. Core Abilities is a module related to soft skills that are required as a skilled worker. For example, related to workplace safety, organisational structure, communication relationships, work ethics, problem solving and the use of information technology (IT) applications at a basic level.

MAPPING PROCESS

Core Abilities has FOUR (4) different levels and each level has its own module. For the implementation of the modular programme, the Core Abilities module is not mandatory. This Core Abilities module is mandatory for full certification only. Each Core Abilities level allocates 40 hours of training. If the polytechnic implements SKM level 3, then the minimum training period for Core Abilities is 120 hours. **Figure 46** shows an example of the summary format for mapping all Competency Units to obtain full SKM.

NAMA AGENSI : POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH (PSA)							
NAMA PROGRAM AGENSI : DIPLOMA KEJURUTERAAN MEKANIKAL					NAMA NOSS : PELUKIS PEL		
JUDUL PROGRAM AGENSI : DKM					KOD NOSS : MC-080-3:2013		
CU/DUTY	BIL WORK ACTIVITY (WA)/TASK	BIL WA/TASK DIPENUHI (B)	% WA/TASK DIPENUHI [(B/A)*100]	NAMA WA/TASK TIDAK DIPENUHI	TEMPOH LATIHAN (JAM)		CADANGAN JAWATANKUA PEMETAAN
					SKPK (NOSS)	KURIKULUM AGENSI	
CU 1	5	5	100%	TIADA	80	65	Memenuhi 90% per
CU 2	5	5	100%	TIADA	320	280	
CU 3	6	6	100%	TIADA	80	120	
CU 4	7	7	100%	TIADA	320	260	
JUMLAH % KESELURUHAN			100	JUMLAH JAM	800	725	
ELEMEN	BIL ABILITY (A)	BIL ABILITY DIPENUHI (B)	% ABILITY DIPENUHI [(B/A)*100]	NAMA ABILITY TIDAK DIPENUHI	TEMPOH LATIHAN (JAM)		CADANGAN JAWATANKUA PEMETAAN
					SKK (NCS)	KURIKULUM AGENSI	
CORE ABILITIES	14	14	100%	03.11 Monitor and evaluate performance of human resources	120	120	
JOB TRAINING (OJT)	ADA						
PROJEK AKHIR	ADA						

Figure 46 : Combination of All CUs

MAPPING PROCESS

As a result of the first stage mapping process, polytechnics need to submit to the Skills Development Department for review and verification using **JPK/Mapping/04-B** form. This process is called Mapping Evaluation Formulation (Second Stage). This formulation is based on a review of the first level mapping document. The results of this mapping assessment formulation should be recorded using this 4-B (**Figure 47**).

A AGENSI : POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH (PSA) A PROGRAM AGENSI : DIPLOMA KEJURUTERAAN MEKANIKAL D PROGRAM AGENSI : DKM							NAMA NOSS : PELUKIS PELAN KOD NOSS : MC-080-3:2013
U/DUTY	BIL WORK ACTIVITY (WA)/TASK	BIL WA/TASK DIPENUHI (B)	% WA/TASK DIPENUHI [(B/A)*100]	NAMA WA/TASK TIDAK DIPENUHI	TEMPOH LATIHAN (JAM)		ULASAN PANEL JAWATANKUASA PENILAIAN PEMETAAN PROGRAM KEMAHIRAN
					SKPK (NOSS)	KURIKULUM AGENCI	
CU 1	5	5	100%	TIADA	80	65	
CU 2	5	5	100%	TIADA	320	280	
CU 3	6	6	100%	TIADA	80	120	
CU 4	7	7	100%	TIADA	320	260	
JUMLAH % KESELURUHAN			100	JUMLAH JAM	800	725	
LEMBAGA	BIL ABILITY	BIL ABILITY DIPENUHI	% ABILITY DIPENUHI	NAMA ABILITY TIDAK	TEMPOH LATIHAN (JAM)		CADANGAN JAWATANKUASA

Figure 47 : 04-B Form

The results of the mapping evaluation will be presented to the Technical Committee I (JKT I) or the Skills Qualification Evaluation and Recognition Committee (JPPKK) for approval. After the application is considered, KPPK can approve the application by issuing ONE (1) certificate to the polytechnic that applied or rejected the application, stating the reasons for rejection. Polytechnics must submit a new application if the SKPK (NOSS) is reviewed or suspended or the polytechnic curriculum has changed by more than 30% based on the curriculum content that has been mapped.

SUMMARY & CONCLUSION

WVPSA

SUMMARY

The implementation of the modular program stipulates a minimum training period of 20 hours including the evaluation period, whereas the duration of training hours for SKM depends on the level of the SKM, namely:

- ☐ Level 1-2: 400-600 hours
- ☐ Level 3 (starting with Level 2): 800-1200 hours
- ☐ Level 3 (starting with Level 3): 1600-2400 hours
- ☐ DKM only: 800-1200 hours (includes final project + 3 months of industrial training)
- ☐ DKM (starting with Level 4): 2400-3600 hours (includes final project + 3 months of industrial training)
- ☐ DLKM only: 1200-1800 hours (includes final project + 3 months of industrial training)
- ☐ DLKM (beginning Level 5): 3600-5400 hours (includes final project + 6 months of industrial training)

In general, the process of mapping JPK's NOSS with the Polytechnic Syllabus involves several stages and the involvement of various parties, namely JPK, Industry (field experts) and Polytechnic. The importance of this mapping process can be seen in terms of the conditions to implement the Malaysian Skills Certificate (SKM) or Modular programme. The biggest impact is ONE (1) of the conditions for the polytechnic to be accredited as an Accredited Center by the Skills Development Department, Ministry of Human Resources. Recognition as an Accredited Center means that the Polytechnic can carry out skills training for students or the general public. Various allocation funds are provided to implement these skills training programme, including funds from JPK itself and from the Skills Development Fund Corporation (PTPK). In fact, polytechnic students are given the opportunity to get dual certificates, namely the existing Diploma and SKM/Modular. This mapping guide can be a polytechnic reference resource to start the basic stages of implementing the NOSS mapping process. The existing guide is too simple and general, so it does not help to understand the mapping process clearly.

MIND TEST

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What is meant by Competency Unit (CU)?

- The minimum competencies required by a skilled worker are clustered within each NOSS.

What is meant by Work Activity (WA)?

- Work activities that involve knowledge and skills in each competency unit.

What is the minimum SKM training period according to level for Level 1?

- 400 - 600 hours

If implementing SKM Level 2, what is the minimum duration of Core Abilities implementation?

- 80 hours

What is the purpose of NOSS mapping?

- Ensuring that each competency unit and work activity are balanced according to the requirements of NOSS

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ISSUED:



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