

# Polytechnic Curriculum & National Occupational Skills Standard Mapping Process

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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.

**Keywords-**SKM, NOSS, PSA, CURRICULUM.

## I. 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.

## II. POLYTECHNIC & DEVELOPMENT SKILLS DEPARTMENT

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). 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). 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. 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: 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)

### III. 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 needs 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 1.



Fig 1. DSD Website.

### IV. 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

The first level mapping (1) 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

- 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 2**) 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).



Fig 2. NOSS Sample.

To understand NOSS, the first step to refer to is the Competency Profile Chart (CPC). This competency chart 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 (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 are measured to achieve the desired level. 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. 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. Each work activity (WA) 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. 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. 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.

- 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 3**.

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

Fig 3. COCU Vs Syllabus.

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. This post (only polytechnic reference, the original format issued 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 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. 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. The results of the mapping evaluation will be presented to the Technical Committee 1 (JKT1) 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.

## V. CONCLUSION

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).

Infact, 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.

## VI. APPENDIX NO FIGURE PAGES

- 1 DSD Website 2
- 2 NOSS Sample 2
- 3 COCU Vs Syllabus 3

## VII. ACKNOWLEDGMENT

Alhamdulillah, all praise and thanks to Allah جل جلاله for His mercy and grace to all of us as the people of Prophet Muhammad صلى الله عليه وسلم. 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.

## REFERENCES

- [1] JPP, Manual Pembangunan Kurikulum Program Pengajian Politeknik, 2013
- [2] JPK, Garis Panduan Pelaksanaan Pemetaan Program Berasaskan Standard Kemahiran Pekerjaan Kebangsaan, 2015
- [3] JPK, Panduan Pelaksanaan Sistem Latihan Program Bertauliah (SLAPB) Berasaskan Kredit,

- 2019[4]. JPK, NOSS Mechanical Draughtmanship  
Level 3,2013
- [4] JPPKK, Silibus DJJ10013 Engineering Drawing,  
2019
- [5] JPPKK, Silibus DJJ30122 CAD,  
2019 [www.myspike.my](http://www.myspike.my)
- [6] PSA, Borang pemetaan SKM Pelukisan  
PelanMekanikal, 2020