Jabatan Pembangunan Kemahiran
Kementerian Sumber Manusia, Malaysia

NATIONAL OCCUPATIONAL SKILLS STANDARD
(STANDARD KEMAHIRAN PEKERJAAN KEBANGSAAN)

C181-001-2:2023

DIGITAL PRINTING TECHNICAL SERVICES

PERKHIDMATAN TEKNIKAL PERCETAKAN DIGITAL

LEVEL 2

Department of Skills Development (DSD)
Federal Government Administrative Centre
62530 PUTRAJAYA, MALAYSIA

NATIONAL OCCUPATIONAL SKILLS STANDARD

DIGITAL PRINTING TECHNICAL SERVICES

PERKHIDMATAN TEKNIKAL PERCETAKAN DIGITAL

LEVEL 2

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Preface

Standard Definition

The National Occupational Skills Standard (NOSS) is a Standard document that outlines the **minimum** competencies required by a skilled worker working in Malaysia for a particular area and level of occupational, also the path to achieve the competencies. The competencies are based on the needs of employment, according to the career structure for the occupational area and developed by industry experts and skilled workers.

The National Competency Standard (NCS) is a Standard document that outlines the competencies required by a skilled worker in Malaysia.

Description of Standard Components

The document is divided into three (3) components which includes: -

Component I **Standard Practice**
This component is about the information related to occupational area including introduction to the industry, Standard requirements, occupational structure, levelling of competency, authority and industry requirements as a whole.

Component II **Standard Content**
This component is a reference to industry employers in assessing and improving the competencies that is required for a skilled worker. The competencies are specific to the occupational area. The component is divided into two (2) section which are the chart (Competency Profile Chart, CPC) and details of the competencies (Competency Profile, CP).

Component III **Curriculum of Competency Unit**
This component is a reference for the training personnel to identify training requirements, design the curriculum, and develop assessment. The training hours that included in this component is based on the recommendations by the Standard Development Committee (SDC). If there are modifications to the training hours, the Department provides the medium for discussion and consideration for the matter.

Abbreviation

1	3R	Reduce, Recycle, Reuse
2	5S	Sort, Set in Order, Shine, Standardize, and Sustain
3	AR	As required
4	CAGR	Compound Annual Growth Rate
5	CMYK	Cyan, Magenta, Yellow, Key (Black)
6	CP	Competency Profile
7	CPC	Competency Profile Chart
8	CPC_{PdP}	Competency Profile Chart for Teaching & Learning
9	CU	Competency Unit
10	DOE	Department of Environment
11	ESG	Environment Social Governance
12	FIFO	First In First Out
13	FOGRA	Fogra Graphic Technology Research
14	HEPA	High Efficiency Particulate Air
15	ILMIA	Institute of Labour Market Information and Analysis
16	IT	Information Technology
17	IR	Industrial Revolution
18	LAN	Local Area Network
19	LIFO	Last In First Out
20	M&A	Management & Administration
21	MCMC	Malaysian Communication Multimedia Commissions
22	MSC	Malaysian Skills Certificate
23	MSDS	Material Safety Data Sheet
24	MSIC	Malaysian Standard Industrial Classification
25	NCS	National Competency Standard
26	NIP	Non-Impact Printing
27	OAS	Occupational Area Structure
28	OS	Occupational Structure

29	PBL	Problem Based Learning
30	PDPA	Personal Data Protection Act
31	PPE	Personal Protective Equipment
32	PSDS	Product Safety Data Sheet
33	RGB	Red, Blue, Green
34	RIP	Raster Image Processing
35	SBT	Scenario Based Learning
36	SD	Sustainable Development
37	SOP	Standard Operating Procedure
38	SPM	*Sijil Pelajaran Malaysia*
39	TEM	Tools, Equipment and Materials
40	UGRA	Association for the Promotion of Research in the Graphic Arts
41	UV	Ultraviolet
42	WAN	Wide Area Network

Glossary

1	Artwork	Artwork (graphic arts), a graphical in digital format representation of an image used in the digital printing process.
2	Artwork Setting	Parameter set in in the artwork creations.
3	Bleed	Printing that goes beyond the edge of where the sheet will be trimmed. In other words, the bleed is the area to be trimmed off.
4	Crop mark	Markings at edges of original or on guide sheet to indicate the area desired in reproduction with negative or area trimmed (cropped) at the markings.
5	Digital printer server	Type of server that connects printers to client computers over a network. It accepts print jobs from the computers and sends the jobs to the appropriate printers. Ancillary functions include the ability to inspect the queue of jobs to be processed, the ability to reorder or delete waiting print job or ability to do various kinds of accounting such as counting pages. It also may be used to enforce administration policies (Colour printing quotas, user/department authentication)
6	Drier	Any additive to ink which encourages the drying process.
7	Finish	The surface quality of paper/products.
8	Font	The character which make up a complete typeface and size.
9	Ghosting	The faint image produced during printing, which can see on large or solid areas.
10	Impositioning	Process of arranging the artwork so that once the printed sheets/output are folded and trimmed, the output will appear in the correct order such as 2 up or 4 up, single sided double sided. This process requires special imposition software to arrange the artwork into the optimal layout.
11	Job docket	Document consist of job specifications and details of customer requirements.
12	Kerning	The narrowing of space between two letters so that they become closer and take up less space on the page.
13	Layout	A rendition that shows the placement of all the elements, roughs, thumbnails, etc. of the final printed piece before it goes to print.
14	Modules	Digital printer sections with difference functionality such as input, imaging/scanning, pressing /transferring, interfacing between pressing and finishing (folding, stitching, trimming & binding) modules.
15	Pre- flight	Process of confirming that the digital files required for the printing process are all present, valid, correctly formatted, and of the desired type.

16	Proof	Colour separation data is digitally stored, creating an image of the final product before it is actually printed.
17	Substrates	Raw materials used in digital printing industries such as papers, plastic, tarpaulin, etc.
18	Text area	The text area is an additional 1.5mm inside the trim line. This is to ensure that your text and the important parts of your artwork are not cut off and stays within a reasonable and safe position. If there are some small inaccuracies during the cutting process, main content will not be cut off.
19	Transparency	Ink that do not block out the coloured inks that they print over, but instead blend with them to create intermediate colours.
20	Trim	The trim is the die line of the label (cutting area) where your artwork is going to be cut, the bleed line should be 1.5mm from the trim line and in Adobe Illustrator, the trim line would be the actual document size.
21	Varnishing	A process used a clear shiny ink used to add gloss to printed pieces.

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Acknowledgement

Director General of Department of Skills Development (DSD) would like to extend his gratitude to the National Skills Development Council (MPKK), Standard Technical Committee (JTS), Standard Technical Evaluation Committee (JTPS), Standard Development Committee (JPS), and organisation and individuals who have been involved directly or indirectly for the contribution, persistence, and support in the development of this Standard until it is completed.

STANDARD PRACTICE

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

1. Introduction

The printing industry in Malaysia is large and fragmented. It can be divided into three main printing segments: publication, commercial and packaging. In business, printing is used to help communicate information, demonstrate commercial advantage, create impact, and make headlines. Printing uses eye-catching designs to help companies stand out in today's competitive marketplace. As well as in business, the printing sector produces large amounts of material for our education system, entertainment, and other sectors. It serves every part of the Malaysian economy.

Global printing markets are changing, many publishing products have electronic versions replacing previously printed volumes. E-books, online newspapers and magazines are taking significant sections of their respective markets; while directories, catalogues and brochures have electronic alternatives; more transactions are electronic reducing demand for currency and cheques; and advertising spending is moving into new areas including online.

These factors, alongside the continued growth of social networking, result in declining volumes of many print products, but not packaging and labels where demand grows. Based on the article by printmalaysia.com, packaging and labels are growing consistently, while publication print volumes and values are declining significantly. In publication and commercial graphics, electronic media is steadily replacing printed products, thus resulting in print manufacturers being forced to implement efficient workflow and utilizing automation to minimize make-ready and lower waste, reducing demand for paper and inks.

As digital systems develop, there will be supply chain efficiencies such as reducing waste and unused packaging. Used mainly in the commercial print and labels segments, digital print is performing far better than long-established analogue alternatives. It will increase in market share as new applications grow (particularly in packaging).

Several factors are driving the growth of digital printing. Although printing technology for offset processes continues to develop, their major developments in digital printing, is particularly inkjet. In terms of application, digital printing will continue to grow in most print industry sectors.

Demand for printed products has continued to grow. This is despite predictions of a reduction, due to the impact of electronic media. The printing industry uses the latest technology. It needs bright, creative, enthusiastic people with wide-ranging skills. Printing companies become specialists in their field as different types of end products require slightly different machinery. The printing industry in Malaysia will continue to grow despite the advent of the challenges of electronic media or the internet. Malaysia has a rich printing legacy, and it is considered one of the oldest industries in the country. Endowed with strong government support and substantial human resources, this industry could expand through the cooperation among the government, printing companies and training centres.

1.1 Occupation Overview

Digital printing refers to direct printing methods from a digital-based image to various media. It usually refers to professional printing, where small-run jobs from desktop publishing and other digital sources are printed using large-format and/or high-volume laser or inkjet printers. Digital printing costs more per page than more traditional offset printing methods. However, this price is usually offset by avoiding the cost of all the technical steps required to make printing plates and producing fewer printing wastages. Other advantages of digital printing are the ability to print in such low volume, speedy turnaround time and the capability of doing variables data.

A digital printing operator receives and reproduces information from a computer into a paper or other substrate format. They required operating and maintaining digital printers while satisfying customer specifications. Digital printing operator uses digital printer and software programs to create products as per client request effectively. In fulfilling these requests, they may change many printer setup variables, such as dimension, colour, or contrast. Often, successful digital print operators have numerous printing projects going simultaneously and create schedules to reflect these various deadlines.

Digital printing generally requires materials to be well-stocked to operate effectively. Depending on the printing program and digital printers, operators may need to purchase and stock new ink cartridges/ toner, paper, or other substrates. Efficient operators often use stock ordering schedules to keep up with work deadlines.

1.2 Rationale of NOSS Development

The need for knowledge workers and market-driven expertise will become more critical. The technology change and shortage of skilled workforce, need to be addressed more comprehensively, through NOSS development and industrial training. The previous Digital Printing Production Levels 2-3 was developed in 2014. This NOSS is reviewed to anticipate technology change and shortage of skilled workforce in this industry as well as to replace the previous NOSS format.

This is a revision of NOSS namely **PR-020-2:2014 Digital Printing Production and F-090-2 Digital Printing Operator (NIP).** The revision process includes mapping the NOSS to compare and identify competencies relevant to the current industry needs. Consensus regarding job analysis and job matrix was obtained from the panellist, where thorough discussion and debates were conducted during several reviewing sessions. The reviewed sessions amended the Occupational Structure which now depicts the job titles in the industry and reflects the level's definition by the Department of Skills Development (DSD). A summary of Job Title comparisons between existing NOSS and new NOSS can be referred to Table 1.

Table 1: Job Title Comparison between Existing NOSS (Digital Printing Production) and New NOSS (Digital Printing Technical Services) Level 2

		Existing NOSS	New NOSS
NOSS Title		PR-020-2:2014 Digital Printing Production and F-090-2 Digital Printing Operator (NIP)	C181-001-2-2023 Digital Printing Technical Services
		Job Title	
Level	Level 3	Digital Printing Technical Supervisor	Digital Printing Senior Technician
	Level 2	Digital Printing Operator	Digital Printing Technician
	Level 1	N/A	Digital Printing Operator

The results of the existing NOSS review found that the competencies are still relevant to the industry's current needs. However, the term for job layout setting in competency digital printing job/layout setting changed to artwork setting. The development panel decided that it needs to be changed due to the diversification of products. Digital printing technology production is also for non-publication products such as large format, sticker, labelling and packaging . The work activities also have been combined according to continuous task flow for completing related activities. The revision is also due to the current nature of the job, which requires the latest technology, business trends and government policy towards Industrial Revolution 4.0 (IR 4.0) and Sustainable Development Goals (SDG), which necessitate competency in a variety of challenges in Digital Printing Technical Services and tasks involved in a wide range of contexts and industry expectations. A summary of competency comparisons between existing NOSS and new NOSS can be referred to Table 2.

Table 2: Competency Comparison between Existing NOSS (Digital Printing Production) and New NOSS (Digital Printing Technical Services) Level 2

NOSS	C181-001-2-2023 Digital Printing Technical Services				
PR-020-2:2014 Digital Printing Production and F-090-2 Digital Printing Operator (NIP)	Competency Unit	Carry Out Artwork Setting Finalization	Perform Digital Printer Setup	Perform Digital Printing Process	Perform Digital Printer Routine Maintenance
	PR-020-2:2014-C01 Digital Printing Job/ Page Layout Setting	x			
	PR-020-2:2014-C02 Digital Printer Setup		x		
	PR-020-2:2014-C03 Digital Printing Production Operation			x	
	PR-020-2:2014-C04 Digital Printer Routine Maintenance				x

1.3 Rationale of Occupational Structure and Occupational Area Structure

In view of the complexity of the process, technology advancement, and industry practice, the NOSS development committee has come to a consensus that according to MSIC 2008, the NOSS is classified in (Section C) Manufacturing. The 3-digit code closely matches the NOSS (Group 181) Printing and Service Activities Related to Printing. The Occupational Job Structures for the printing sector were also referred to in determining the section and group for this job title. The identified job areas are Digital Printing.

The outcome of the job analysis has shown that the job functions of Level 1 and Level 2 complement each other. The job titles differed according to seniority and experience, whereas all titles produced the same output. Therefore, the NOSS development committee members decided that Level 1 competencies should be embedded with Level 2 to produce Competency Units that qualify to be a complete work cycle which will fulfil the industry demands. The current Occupational Structure and Occupational Area Structure are depicted in Figures 1 and 2.

1.4 Regulatory/Statutory Body Requirements Related to Occupation

Printing being a regulated industry in this country, it is understandable that foreign participation in printing projects has to be controlled. All printing companies, whether local or with foreign participation, must apply for Printing License from the Ministry of Home Affairs (MHA) with conditions imposed in the license to be complied with.

a) Printing Press and Publications Act 1984.
b) Occupational Safety and Health Act 1994.
c) Environmental Protection Act 1974 (Act 127).
d) Labour Act 1955 (Act 265).
e) Industrial Relation Act 1967.
f) Personal Data Protection Act 2010 (PDPA).

1.5 Occupational Prerequisite

The minimum requirements set forth by the industry for any interested individual to undertake the job or career in this area are as follows:

a) 18 years of age and above (Employment Act 1955 – Act 265); and
b) Medically fit (certified by Medical Officer or Occupational Health Doctor).

1.6 General Training Prerequisite for Malaysian Skills Certification System

The prerequisite for the enrolment of this programme is as below:

a) Preferably Sijil Pelajaran Malaysia (SPM) or at basic 16 years old entry level for college vocational;
b) Basic computer knowledge;
c) Not colour blind; and
d) Able to read and write in bahasa Malaysia and/or English.

2. Occupational Structure (OS)

Section	(C) Manufacturing		
Group	(181) Printing and Service Activities Related to Printing		
Area	Press Printing	Digital Printing	Post-Press Printing
Level 5	Press Operation Manager	Digital Printing Manager	Post-Press Operation Manager
Level 4	Press Executive	Digital Printing Executive	Post-Press Executive
Level 3	Press Senior Technician	Digital Printing Senior Technician	Post-Press Senior Technician
Level 2	Press Technician	Digital Printing Technician	Post-Press Technician
Level 1	Press Assistant Technician	Digital Printing Operator	Post-Press Assistant Technician

Figure 1: Occupational Structure for Digital Printing

3. Occupational Area Structure (OAS)

Section	(C) Manufacturing		
Group	(181) Printing and Service Activities Related to Printing		
Area	Press Printing	Digital Printing	Post-Press Printing
Level 5	Press Operation Management	Digital Printing Management	Post-Press Operation Management
Level 4	Press Operation Administration	Digital Printing Administration	Post- Press Operation Administration
Level 3	Press Production	Digital Printing Production	Post-Press Production
Level 2	Press Operation	Digital Printing Technical Services	Post Press Operation
Level 1	Embedded to L2	Embedded to L2	Embedded to L2

Figure 2: Occupational Area Structure for Digital Printing

4. Definition of Competency Levels

The NOSS is developed for various occupational areas. Below is a guideline of each NOSS Level as defined by the Department of Skills Development, Ministry of Human Resources, Malaysia.

Level 1: Competent in performing a range of varied work activities, most of which are routine and predictable.

Level 2: Competent in performing a significant range of varied work activities, performed in a variety of contexts. Some of the activities are non-routine and required individual responsibility and autonomy.

Level 3: Competent in performing a broad range of varied work activities, performed in a variety of contexts, most of which are complex and non-routine. There is considerable responsibility and autonomy and control or guidance of others is often required.

Level 4: Competent in performing a broad range of complex technical or professional work activities performed in a wide variety of contexts and with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and allocation of resources is often present.

Level 5: Competent in applying a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts. Very substantial personal autonomy and often significant responsibility for the work of others and for the allocation of substantial resources features strongly, as do personal accountabilities for analysis, diagnosis, planning, execution and evaluation.

5. Award of Certificate

The Director General may award, to any person upon conforming to the Standards the following skills qualifications as stipulated under the National Skills Development Act 2006 (Act 652):

a) Malaysian Skills Certificate (MSC); or
b) Statements of Achievement.

6. Occupational Competencies

The Digital Printing Technical Services Level 2 personnel is competent in performing the following core competencies:

a) Carry Out Artwork Setting Finalization;
b) Perform Digital Printer Preparation;
c) Perform Digital Printing Process; and
d) Perform Digital Printer Routine Maintenance.

7. Work Conditions

Generally, they work under regular working hours from morning to evening, depending on the organisation nature of the business. They may be required to work extra hours and in the shift to fulfil the internal and external requirements. They may work individually or in a group and need to use/wear appropriate attire during the commencement of their jobs. The occupation requires proper physical fitness & alertness, good communication skills, cooperation and ability to understand & execute work instructions from the superior.

8. Employment Prospects

The Malaysian Printing Industry has played a significant role as the primary media for education, communication and dissemination of knowledge and information. Malaysian printing and publishing business is expected to continue its growth as the nation aspires to be fully developed and industrialized by 2020. The industry is constantly working to improve turnaround time, and many have invested in state-of-the-art technology to provide in-house finishing and bindery services. Many printers and publishers also stay abreast of new developments in printing and publishing technology, which have dramatically increased efficiency and productivity, as well as export competitiveness. Malaysia's existing institutional architecture has sustained consistent productivity growth for more than two decades, though challenges need to be addressed in order to refocus attention on productivity growth. These challenges include overcoming skills gaps, maintaining high-quality infrastructure, strengthening the research and development ecosystem, and addressing distortions in output markets.

According to the Department of Statistics, the labour demand in the economic sector during the first quarter of 2022 increased to 8.572 million (Q1 2021:8.424 million). The rate of filled jobs was 97.8 percent encompassing a total of 8.388 million filled jobs while the number of job vacancies was 184 thousand with a rate of 2.2 percent (Q1 2021:178 thousand).

Additionally, the number of jobs created also went up to 25.84 thousand in this quarter (Q1 2021:17.38 thousand). C259-008-3:2022 8/163 When analysing the labour demand by skill category, the number of jobs in the semi-skilled category made up 62.3 percent of total jobs or 5.344 million jobs. Meanwhile, the skilled and low-skilled categories registered 24.7 and 13.0 percent respectively. In the skilled category, there were 2.072 million filled jobs, an increase of by 51 thousand jobs as compared to the same quarter of the previous year (Q1 2021:2.021 million) with a rate of 97.9 percent, whereas job vacancies recorded 44.9 thousand or 2.1 percent rate of job vacancies. A total of 8.0 thousand jobs were created in this category.

Semi-skilled category posted 5.242 million filled jobs at a rate of 98.1 percent and 1.9 percent of job vacancies (102.2 thousand). There were 15.2 thousand jobs created in this category. In the meantime, filled jobs in the low-skilled category increased by 0.3 percent to 1.073 million compared to the same quarter of the preceding year (Q1 2021:1.070 million). The number of job vacancies accounted for 37.3 thousand vacancies with a rate of 3.4 percent. A total of 2.6 thousand jobs were created in this category.[1]

Based on the official statistics of the Ministry of Home Affairs there are currently more or less 2826, printing-related enterprises registered with the Ministry. It must be highlighted that the number of printing-related enterprises registered with the ministry fluctuates frequently due to the number of applications. Most of these enterprises are in towns, cities, and commercial centres. In recent years, keeping with the country's economic development, packaging printing, in particular, has seen the most significant growth momentum. The digital printing market is growing at a Compound Annual Growth Rate (CAGR) of 6.56% over the next 5 years. Asia Pacific is growing at the highest CAGR over 2021- 2026. [2]

The Printing Industry provides a steady economic impact to the nation, whereas concurrently, advancements in the different areas of the Printing Industry will be required to meet these demands. In order to increase productivity and quality output, workers in the industry must enhance their skill sets and possess relative skills in emerging areas of production.

There are excellent prospects in the private sector due to the shortage of hands-on experts in digital printing. Digital Printing Technical Services L2 personnel trained under this training program is eligible to be employed in the printing sector. This area has an excellent job market potential domestically for skilled personnel due to the shortage of such highly skilled personnel in Malaysia.

Occupation with respect to employment opportunities is:

- Digital printing Technician.
- Digital printing Senior Technician.
- Digital printing Supervisor.
- Digital Printing Instructor/ Trainer.

[1] Employment Statistics First Quarter 2022, Department of Statistics Malaysia Official Portal (dosm.gov.my), Retrieved on 7/10/2022,11.00 am.

[2] https://www.mordorintelligence.com/industry-reports/digital-printing-market. Retrieved on 27/03/2023,11.00 am.

- Digital Printing Sales and Trading Assistant.

Industries with respect to employment opportunities are:

- Media companies.
- Printing and publishing companies.
- Education & Training.
- Manufacturing.
- Equipment Services.
- Corporate and government bodies.
- Quick print shop.

According to the Institute of Labour Market Information and Analysis (ILMIA), Department of Statistics Malaysia and other references, the average salary for Digital Printing Production Personnel in Malaysia is RM1800-RM3000 inclusive of allowances and other incentives per month. The actual amount of salary offered depends on the size of the employer's operations, skill level and work experience.[3]

9. Up Skilling Opportunities

Career path in digital printing production depends on the type and size of the organisation. In general, there will be more career development opportunities with larger employers. Most competent Digital printing technical services personnel enhance their job competency. They usually begin in a junior position and gradually learn new skills as they gain experience.

For career advancement, they may enhance their knowledge and skill by attending professional courses offered by recognised education providers such as Digital Print Professional and Colour Management Professional (CMP).

[3] MyJobProfile (Labour Market Information Data Warehouse) - Printers (ilmia.gov.my), Retrieved on 7/10/2022,11.00 am.

10. Organisation Reference for Sources of Additional Information

The following organisations can be referred as sources of additional information which can assist in defining the document's contents.

a) Kementerian Dalam Negeri (KDN)
Blok D1, D2, D7 & D9, Kompleks D,
Pusat Pentadbiran, Kerajaan Persekutuan,
62546 Putrajaya
03 8000 8000
03 88891613 / 03-88891610
pro@moha.gov.my

b) Department of Occupational Safety and Health (DOSH)
Level 1, 3, 4 & 5 Block D4
Complex D, Federal Government Administrative Centre
2530 Putrajaya
03 8000 8000
www.dosh.gov.my
projkkp@mohr.gov.my

c) SIRIM
No. 1, Persiaran Dato' Menteri, Seksyen 2
Peti Surat 7035, 40700 Shah Alam
Selangor Darul Ehsan
03 5544 6000
web@sirim.my

d) Malaysia Printers Association of Malaysia
No. 42-1, Jalan 11/34A
Kepong Entrepreneurs Park
Batu 7, Jalan Kepong
52100 Kuala Lumpur, Malaysia.
03 6251 2187
malaysiaprintersassociation@gmail.com

e) Malay Entrepreneur Printing Association of Malaysia
7-1 Block K2
Jalan 3/1
Taman Seri Merdeka, 68000 Ampang
Selangor
03 4295 3010

f) Selangor and Federal Territory Chinese Printing Presses' Association
1st Floor, No 56 Jln Radin Anum 1
Bandar Baru Sri Petaling
57000 Kuala Lumpur
03 9057 2532
beltech@tm.net.my

g) Fogra Graphic Technology Research Association (FOGRA)
Fogra Forschungsgesellschaft Druck e.V.
Streitfeldstraße 19
81673 München
49 8943182-214
www.fogra.org/en/
contact@fogra.org

h) Association for the Promotion of Research in the Graphic Arts Industry (UGRA)
Lerchenfeldstr 5
CH-9014 St. Gallen
+41 712747473

11. Standard Technical Evaluation Committee

NO	NAME	POSITION & ORGANISATION
CHAIRMAN		
1	Norazmi bin Mokni	Principal Assistant Director Department of Skill Development
EVALUATION PANEL		
1	Aniza binti Ahmad	Assistant Vocational Training Officer Institut Latihan Perindustrian Kuala Lumpur
2	Nor Aziaty binti Ahmad	Managing Director DE Dinar Enterprise Sdn. Bhd.
3	Mohamad Fadhali bin Mohamed Yusop	Manager Ultimate Print (M) Sdn. Bhd.
4	Kamarruzaman bin Mohd Supian	Senior Production Executive MCC Label's (Kuala Lumpur)
5	Badrol Hisham bin Mohd Noh	Consultant Percetakan Watan Sdn. Bhd.
SECRETARIAT		
1	Faizatun Izzah binti Zohedi	Assistant Director Department of Skill Development

12. Standard Development Committee

DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

NO	NAME	POSITION & ORGANISATION
DEVELOPMENT PANEL		
1	Hasnah binti Patang Nagari	Assistant Vocational Training Officer Institut Latihan Perindustrian Kuala Lumpur
2	Mohd Adam bin Jab	Assistant Vocational Training Officer Institut Latihan Perindustrian Arumugam Pillai Nibong Tebal, Pulau Pinang
3	Muhamad Fadlishah bin Rusli	Managing Director Akar Digital Sdn. Bhd. Selangor
4	Zarimah binti Hasan	Managing Director Idaman Print Sdn. Bhd. Kuala Lumpur
5	Abdul Manaf bin Yaacob	General Manager Nasyrul Quran Putrajaya, Wilayah Persekutuan
6	Ahmad Tarmizi bin Abdul Rahman	Business Development & SLDN Manager, Coach Akar Digital Sdn. Bhd., Selangor
7	Mohamad Irfan bin Ismail	Manager Kejar Pelangi (Kilangpakaian.com) Selangor
8	Nik Anita binti Nik Sulaiman	Manager Suha Design and Printing Sdn. Bhd. Selangor
9	Razlan bin Rusli	Sales Manager Tahan Press, Kuala Lumpur
FACILITATOR		
1	Siti Salmah binti Mohd Nor	Ciast/PPL/FDS-0077/2013 Precious Galaxy Sdn. Bhd.

STANDARD CONTENT

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

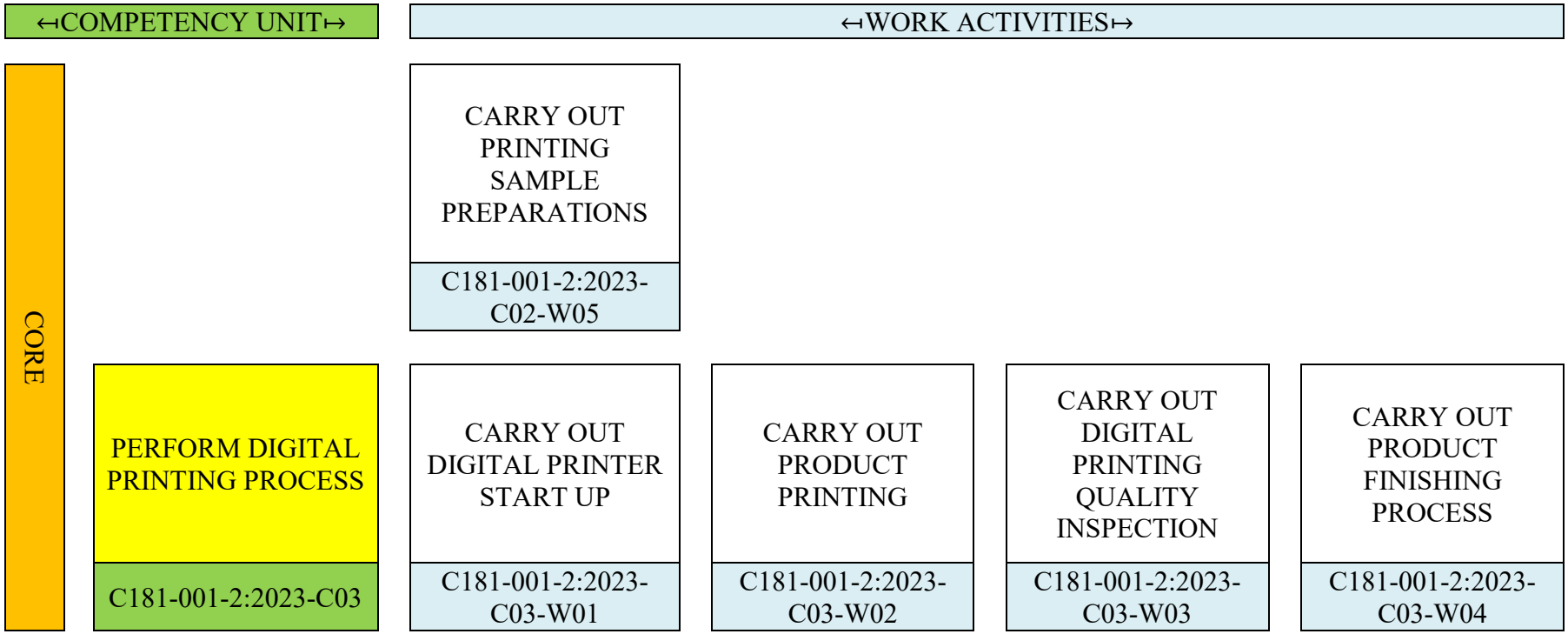
DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

13. Competency Profile Chart (CPC)

SECTION	(C) MANUFACTURING		
GROUP	(181) PRINTING AND SERVICE ACTIVITIES RELATED TO PRINTING		
AREA	DIGITAL PRINTING		
NOSS TITLE	DIGITAL PRINTING TECHNICAL SERVICES		
NOSS LEVEL	TWO (2)	NOSS CODE	C181-001-2:2023

	↤COMPETENCY UNIT↦	↤WORK ACTIVITIES↦			
CORE	CARRY OUT ARTWORK SETTING FINALIZATION	CARRY OUT DIGITAL ARTWORK SETTING CONFIRMATION	CARRY OUT DIGITAL ARTWORK SETTING ADJUSTMENT	CARRY OUT FINAL DIGITAL ARTWORK COMPILATION	
	C181-001-2:2023-C01	C181-001-2:2023-C01-W01	C181-001-2:2023-C01-W02	C181-001-2:2023-C01-W03	
	PERFORM DIGITAL PRINTER PREPARATION	CARRY OUT DIGITAL PRINTING SPECIFICATION CHECKING	ORGANISE DIGITAL PRINTING SUBSTRATES	CARRY OUT DIGITAL PRINTER SERVER SETTING	CARRY OUT DIGITAL PRINTER SETUP
	C181-001-2:2023-C02	C181-001-2:2023-C02-W01	C181-001-2:2023-C02-W02	C181-001-2:2023-C02-W03	C181-001-2:2023-C02-W04


↤COMPETENCY UNIT↦
↤WORK ACTIVITIES↦
CORE
CARRY OUT PRINTING SAMPLE PREPARATIONS
C181-001-2:2023-C02-W05
PERFORM DIGITAL PRINTING PROCESS
C181-001-2:2023-C03
CARRY OUT DIGITAL PRINTER START UP
C181-001-2:2023-C03-W01
CARRY OUT PRODUCT PRINTING
C181-001-2:2023-C03-W02
CARRY OUT DIGITAL PRINTING QUALITY INSPECTION
C181-001-2:2023-C03-W03
CARRY OUT PRODUCT FINISHING PROCESS
C181-001-2:2023-C03-W04

↤COMPETENCY UNIT↦	↤WORK ACTIVITIES↦				
CORE		CARRY OUT HOUSEKEEPING PRACTICE			
		C181-001-2:2023-C03-W05			
	PERFORM DIGITAL PRINTER ROUTINE MAINTENANCE	PREPARE DIGITAL PRINTER ROUTINE MAINTENANCE REQUIREMENTS	CARRY OUT DIGITAL PRINTER SERVICING	CARRY OUT DIGITAL PRINTER CALIBRATION	UPDATE DIGITAL PRINTER ROUTINE MAINTENANCE RECORD
	C181-001-2:2023-C04	C181-001-2:2023-C04-W01	C181-001-2:2023-C04-W02	C181-001-2:2023-C04-W03	C181-001-2:2023-C04-W04

14. Competency Profile (CP)

SECTION	(C) Manufacturing		
GROUP	(181) Printing and Service Activities Related to Printing		
AREA	Digital Printing		
NOSS TITLE	Digital Printing Technical Services		
NOSS LEVEL	Two (2)	NOSS CODE	C181-001-2:2023

CU TITLE & CU CODE	Carry Out Artwork Setting Finalization. C181-001-2:2023-C01
CU DESCRIPTOR	Carry Out Artwork Setting Finalization describes the process of confirming the artwork received by assessing and editing artwork file over the digital printer setting (upon approval of relevant parties). The approved final artwork will proceed for further printing activities. The person who is competent in this CU should be able to carry out digital artwork setting confirmation, carry out digital artwork setting adjustment and carry out final digital artwork compilation. The outcome of this CU is to finalise job/artwork setting to ensure production output can be executed effectively and correctly in accordance with customer requirements and company Standard Operating Procedure (SOP).

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
1. Carry out Digital Artwork Setting Confirmation.	1.1 Interpret job docket. 1.2 Evaluate digital artwork files. 1.3 Assess digital artwork setting. 1.4 Acquire digital artwork setting confirmation.	1.1 Job docket details such as type of products and category (publication/non publication), product substrates and type of product finishing identified and confirmed in accordance with printing specification. 1.2 Artwork files format and compatibility identified and confirmed in accordance with type of software. 1.3 Artwork size, resolutions, image, colour, typesetting confirmed in accordance with product specifications.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
		1.4 Artwork setting approval status confirmed prior to editing in accordance with printing specification and company SOP.
2. Carry out Digital Artwork Setting Adjustment.	2.1 Edit digital artwork printing and cutting area. 2.2 Edit digital artwork image. 2.3 Edit digital artwork colour. 2.4 Edit digital artwork typesetting.	2.1 Digital artwork printing and cutting area details comprised of product size, resolutions, orientation, bleed, trim line, crop mark/line and text position adjusted and confirmed in accordance with customer requirements and type of software. 2.2 Digital artwork image brightness and contrast adjusted and confirmed in accordance with customer requirements and job docket. 2.3 Digital artwork colour format requirement adjusted and confirmed in accordance with customer requirements and job docket. 2.4 Digital artwork typesetting format (font type, size, kerning, leading etc.) adjusted and confirmed in accordance with customer requirements and job docket.
3. Carry out Final Digital Artwork Compilation.	3.1 Compile edited digital artwork. 3.2 Check final digital artwork setting. 3.3 Check artwork pre-flight. 3.4 Compile final digital artworks. 3.5 Record authorised personnel approval.	3.1 Edited artwork files format confirmed and retrieved in accordance with job specifications. 3.2 Edited artwork setting including printing areas, image, colour, and typesetting confirmed against job specification in accordance with customer requirements. 3.3 Pre-flight artwork results (actual size, image and font sharpness, transparency, colour modes, etc.) confirmed in accordance with job specifications. 3.4 Pre-flight report format determined and auto-generated in accordance with software specifications. 3.5 Final digital artwork files saved, and final approval status documented systematically in accordance with artwork format.

CU TITLE & CU CODE	Perform Digital Printer Preparation. C181-001-2:2023-C02
CU DESCRIPTOR	Perform Digital Printer Preparation describes the process of printing, including changing over the digital printer setting from default/initial program to print job requirements. The person who is competent in this CU should be able to carry out digital printing specification checking, organise digital printing substrates, carry out digital printer server setting, carry out digital printer setup and carry out printing sample preparations. The outcome of this CU is related to preparing digital printer prior to printing, the activities involved in setting the printer, its accessories and substrates and to ensure its functionality and operability in accordance with printer manual and company Standard Operating Procedure (SOP). The results of these activities are the digital printer can run smoothly, meet print job requirements and achieve desired output.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
1. Carry Out Digital Printing Specification Checking.	1.1 Determine final digital artworks specification. 1.2 Check digital printing software. 1.3 Check digital printing substrates. 1.4 Check printing finishing specifications.	1.1 Final digital artwork specification reviewed and confirmed in accordance with job specifications and type of printers. 1.2 Digital printing software format confirmed in accordance with job specifications and type of printer. 1.3 Printing substrate specifications (size, thickness/grammage, etc.) and types such as paper, glass, canvas, metal, fabric, marble, and plastic confirmed in accordance with job specifications. 1.4 Printing finishing parameter details confirmed in accordance with job specifications and type of machine.
2. Organise Digital Printing Substrates.	2.1 Collect printing substrates. 2.2 Check substrates specifications. 2.3 Arrange printing substrates.	2.1 Printing substrates stores/location/sources confirmed and obtained in accordance with job specifications and SOP. 2.2 Substrates specification (types, sizes, specialty) type confirmed in accordance with job specifications. 2.3 Printing substrates categorized in accordance with job specifications.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
		2.4 Printing substrates placed correctly, and orientation confirmed based on type of machines in accordance with machine SOP.
3. Carry Out Digital Printer Server Setting.	3.1 Determine printer server software. 3.2 Set impositioning layout. 3.3 Set digital printer colour profile. 3.4 Select digital printer resolution. 3.5 Set substrates parameter. 3.6 Set up digital printer feeding. 3.7 Set up digital printer's finishing parameter.	3.1 Type of printer server software and interface identified in accordance with printer server user manual. 3.2 Impositioning layout setting executed and confirmed in accordance with job specifications and printer manual. 3.3 Digital printer colour profile (FOGRA/UGRA/ISO/US Web Coated/GraCol) setting executed and confirmed in accordance with job specifications and printer manual. 3.4 Digital printer resolution setting confirmed in accordance with job specifications and printer manual. 3.5 Digital printer substrates parameter setting executed and confirmed in accordance with job specifications and printer manual. 3.6 Digital printer feeding setting executed and confirmed in accordance with job specifications and printer manual. 3.7 Digital printer's finishing parameter setting executed and confirmed in accordance with job specifications and printer's manual.
4. Carry Out Digital Printer Setup.	4.1 Interpret printer safety procedures. 4.2 Key in substrates specification onto printer setting. 4.3 Set up toner/ ink and other related consumables. 4.4 Set up substrates. 4.5 Check printer setup readiness.	4.1 Safety procedures (Personnel Protective Equipment (PPE), electrical, work area, equipment/tools, etc.) determined in accordance with Safety, Health, and Environment guidelines (SHE). 4.2 Substrates specification input confirmed into printer setting interface in accordance with job specifications. 4.3 Toner/ ink and other related consumables (replenisher, storage fluid, etc.) setup confirmed in accordance with job docket and printer manual. 4.4 Substrates setting parameters accuracy confirmed in accordance with job docket and printer manual. 4.5 Printer functionality and operability confirmed in accordance with printer manual.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
5. Carry Out Printing Sample Preparations.	5.1 Interpret job docket. 5.2 Interpret safety procedures in printing process. 5.3 Produce sample print. 5.4 Check sample print. 5.5 Acquire sample print approval.	5.1 Printing specification including special printing instructions, colour or quantity determined based on job docket. 5.2 Printing process safety and environmental procedure adhered to in accordance with Safety, Health, and Environment guidelines (SHE) and manufacturer SOP. 5.3 Sample printouts' clarity, sharpness and actual size confirmed in accordance with job docket. 5.4 Sample print and proof conformed in accordance with job docket and specification. 5.5 Printed sample results including image, size, resolution font type, colour brightness and sharpness, approved and documented in accordance with company SOP.

CU TITLE & CU CODE	Perform Digital Printing Process. C181-001-2:2023-C03
CU DESCRIPTOR	Perform Digital Printing Process describes the execution of printing, including cutting, trimming, folding, binding, and finishing (if available). The person who is competent in this CU should be able to carry out digital printer start-up, carry out printing production, carry out digital printing quality inspection, carry out product finishing and carry out housekeeping practice. The outcome of this CU is to fulfil production target in terms of print quality, output volume, printer uptime and delivery deadlines by executing digital printing operation process in accordance with printer manual and company Standard Operating Procedure (SOP).

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
1. Carry out Digital Printer Start Up.	1.1 Check visually digital printer surrounding. 1.2 Interpret digital printer start-up procedure. 1.3 Check digital printer temperature. 1.4 Observe digital printer condition status on printer display.	1.1 Digital printer surrounding (temperature, humidity, lights) and conditions confirmed free from failure/potential risk in accordance with safety procedures. 1.2 Digital printer operability and functions confirmed, and safety procedures adhered to in accordance with SOP and printer manual. 1.3 Digital printer ink/drier/print heater temperature confirmed in accordance with printer specification and type of printer. 1.4 Digital printer condition including printer component checked, abnormalities (error warning, malfunction, failure) messages confirmed, documented, and reported in accordance with type of machines and printer standard.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
2. Carry Out Product Printing.	2.1 Check printing substrates readiness. 2.1 Check production approval status. 2.2 Check quantity against order/ deadline. 2.3 Execute printing works. 2.4 Execute inline post-printing works. 2.5 Handle digital printer malfunction. 2.6 Update production monitoring checklist.	2.1 Type of printing substrates such as paper, plastic, tarpaulin setup in accordance with job specifications. 2.2 Production approval status confirmed in accordance with targeted planning. 2.3 Number of printed copies/products/pieces confirmed in accordance with targeted planning. 2.4 Printing output cleaned, sharped, and precisely produced in accordance with job docket and printing specification. 2.5 Inline post-printing activities such as folding, stacking, binding, trimming, punching completed in accordance with job docket. 2.6 Printer faulty/ production problems (paper jammed, no colour, smear, ghosting, etc.) and cause identified in accordance with printer manual. 2.7 Printer faulty/ production minor issues rectified in accordance with printer manual. 2.8 Printer drum monitored and regularly emptied in accordance with printer user manual. 2.9 Production monitoring checklist format confirmed and completed in accordance with format/system.
3. Carry Out Digital Printing Quality Inspection.	3.1 Interpret quality inspection procedure. 3.2 Check finished printing quality. 3.3 Identify print quality non-conformance. 3.4 Rectify print quality non-conformance. 3.5 Update quality checklist.	3.1 Printing quality inspection procedure and standards determined in accordance job specifications. 3.2 Printing quality standard interpreted, and status confirmed in accordance with job specifications. 3.3 Print quality non-conformance results (smears, scumming, colour variations) identified in accordance with quality standards. 3.4 Printing defects (smears, scumming, bleeding, colour variation, ghosting, etc.) corrected in accordance with quality standards. 3.5 Quality checklist accuracy confirmed and completed in accordance with checklist format/recording system.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
4. Carry Out Product Finishing Process.	4.1 Determine finishing process. 4.2 Setup product finishing machine. 4.3 Execute finishing process. 4.4 Inspect final finishing process output. 4.5 Execute finished product storage.	4.1 Type of finishing process such as varnishing, laminating, and coating confirmed in accordance with job specifications. 4.2 Product finishing machine parameter setup and readiness confirmed in accordance with type of finishing process. 4.3 Finishing process completed including cutting process (trim to size/die cut) completed in accordance with job specifications. 4.4 Final finishing product's colour, text area, logos, graphics etc. accurately printed in accordance with quality standards. 4.5 Finished product arranged systematically and stored safely in accordance with type of product and SOP.
5. Carry Out Housekeeping Practice.	5.1 Identify housekeeping schedule and cleaning procedure. 5.2 Select cleaning tools, equipment, and materials. 5.3 Arrange workplace. 5.4 Handle waste and hazardous material keeping/disposal activities. 5.5 Clean up related modules of digital printers. 5.6 Update housekeeping checklist/ logbook.	5.1 Housekeeping schedule and procedure including date, time and method identified in accordance with SOP. 5.2 Cleaning tools, equipment and materials arranged systematically in accordance with cleaning requirements and procedures. 5.3 Workplace neatness, cleanliness and 5S methodology applied in accordance with SOP. 5.4 Waste and hazardous materials handled, stored, or disposed of in accordance with statutory/ regulatory bodies' requirements. 5.5 Related modules (input module, imaging module, interface module, finishing module) of digital printers cleaned up in accordance with SOP. 5.6 Housekeeping checklist/ logbook accuracy confirmed and completed in accordance with job requirements.

CU TITLE & CU CODE	Perform Digital Printer Routine Maintenance. C181-001-2:2023-C04
CU DESCRIPTOR	Perform Digital Printer Routine Maintenance describes basic routine maintenance as per identified maintenance schedule (daily, weekly, monthly, and anytime) associated with the general upkeep of digital printer against wear and tear. The person who is competent in this CU should be able to prepare digital printer routine maintenance requirements, carry out digital printer routine maintenance, carry out digital printer calibration and update digital printer routine maintenance records. The outcome of this CU is to perform on a regular, specified and ongoing basis to ensure that digital printer is kept in running condition. This will result in the production running smoothly and prevent unplanned downtime in accordance with maintenance schedule, job timeline and company Standard Operating Procedure (SOP).

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
1. Prepare Digital Printer Routine Maintenance Requirements.	1.1 Interpret maintenance schedule. 1.2 Identify type of digital printer's maintenance part. 1.3 Check routine maintenance scope of work. 1.4 Organise maintenance tools and materials.	1.1 Routine maintenance schedule format, date, day, time, and printer location confirmed in accordance with printer manual. 1.2 Type of digital printer's part to be maintained or servicing identified in accordance with maintenance schedule and visual check. 1.3 Scope of work inclusive type of routine maintenance confirmed in accordance with SOP and servicing procedure. 1.4 Maintenance tools and materials suitability confirmed and arranged safely in accordance with printer manual.
2. Carry Out Digital Printer Servicing.	2.1 Interpret safety and environmental procedure. 2.2 Disassemble equipment parts. 2.3 Check related printer components.	2.1 Safety and environmental procedure identified in accordance with SHE guidelines and printer manuals. 2.2 Equipment parts dislocated, separated, and kept safely in accordance with printer manual. 2.3 Related printer components such as roller, blades to be serviced confirmed in accordance with printer manual.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
	2.4 Service related printer components. 2.5 Purge related printer components. 2.6 Check digital printer wear and tear components. 2.7 Replace faulty/wear & tear/broken consumables items or parts. 2.8 Assemble equipment parts. 2.9 Check digital printer functionality. 2.10 Test run digital printer.	2.4 Related printer components such as roller, blades cleaned/greased and wiped in accordance with printer manual. 2.5 Related printer components such as nozzles recovered, and printer unblocked in accordance purging method and printer manual. 2.6 Digital printer components wear, and tear conditions identified in accordance with printer manual. 2.7 Faulty/wear & tear/broken related component (consumables items or parts) replaced in accordance with printer manual. 2.8 Equipment parts joined, fastened and assembled equipment checked in accordance with printer manual. 2.9 Digital printer functionality confirmed in accordance with printer manual. 2.10 Test chart output confirmed in accordance with printer specifications.
3. Carry Out Digital Printer Calibration.	3.1 Print out calibration test chart. 3.2 Execute scanning and/ or measurement processes. 3.3 Update calibrated values into digital printer server. 3.4 Reprint test chart. 3.5 Check revised test chart within limit.	3.1 Calibration test chart (colour patch/stripes) produced in accordance with printer manual and type of printers. 3.2 Scanning and/ or measurement processes executed in accordance with printer manual. 3.3 Calibration measured values updated into digital printer server in accordance with printer manual and colour standard. 3.4 Revised test chart output confirmed in accordance with printer specifications. 3.5 Calibration values confirmed against the target values/within limit in accordance with printer manual and colour standard.
4. Update Digital Printer Routine Maintenance Record.	4.1 Determine maintenance status. 4.2 Update digital printer routine maintenance records. 4.3 Compile digital printer routine maintenance records.	4.1 Digital printer routine maintenance date, day, type of printers and maintained components/area confirmed in accordance with company SOP. 4.2 Digital printer routine maintenance content accuracy and adequacy confirmed, and records completed in accordance with recording system.

WORK ACTIVITIES	WORK STEPS	PERFORMANCE CRITERIA
	4.4 Notify maintenance status to superior or relevant parties.	4.3 Updated records arranged systematically in accordance with company filing procedure. 4.4 Digital printer routine maintenance records accuracy and adequacy confirmed and delivered to superior or relevant parties in accordance with company SOP and format.

CURRICULUM OF COMPETENCY UNIT

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

15. Curriculum of Competency Unit

15.1 Carry Out Artwork Setting Finalization.

SECTION	(C) Manufacturing		
GROUP	(181) Printing and Service Activities Related to Printing		
AREA	Digital Printing		
NOSS TITLE	Digital Printing Technical Services		
COMPETENCY UNIT TITLE	Carry Out Artwork Setting Finalization.		
LEARNING OUTCOMES	The learning outcomes of this competency are to enable the trainees to finalise job/artwork setting to ensure production output can be executed effectively and correctly in accordance with customer requirements and company Standard Operating Procedure (SOP). Upon completion of this competency unit, trainees should be able to: 1. Carry out Digital Artwork Setting Confirmation. 2. Carry out Digital Artwork Setting Adjustment. 3. Carry out Final Digital Artwork Compilation.		
TRAINING PREREQUISITE (SPECIFIC)	Not Available.		
CU CODE	C181-001-2:2023-C01	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Carry out Digital Artwork Setting Confirmation.	1.1 Type of digital printing product category: • Publication. • Non-publication.	1.1 Interpret job docket. 1.2 Evaluate digital artwork files. 1.3 Assess digital artwork setting.	<u>ATTITUDE</u> 1.1 Meticulous in interpreting job docket information. 1.2 Resourceful in identifying job requirements.	<u>COGNITIVE DOMAIN</u> 1.1 Type of digital printing product category listed and explained. 1.2 Digital printing product specification explain. 1.3 Element in tools design applications explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.2 Digital printing product specification: • Colour. • Size. • Type of finishing. 1.3 Element in tools design applications: • Artwork setting. • File format. 1.4 Job docket information: • Job order details. • Product specification. • Type of product finishing. 1.5 Digital printing standard operating procedure (SOP).	1.4 Acquire digital artwork setting confirmation.	1.3 Adhere to Information Technology (IT) security policy with regard to file handling. <u>SAFETY</u> 1.1 Adhere to workplace safety procedures. 1.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 1.1 Apply environmentally sustainable work practices.	1.4 Job docket information explained. 1.5 Digital printing standard operating procedure (SOP) explained. 1.6 Color temperature requirements explained. 1.7 Fundamentals of work area safety guidelines explained. 1.8 Fundamentals of environmentally sustainable work practices defined and interpreted. <u>PSYCHOMOTOR DOMAIN</u> 1.1 Job docket details such as type of products and category (publication/non-publication), product substrates and type of product finishing identified and confirmed in accordance with printing specification. 1.2 Artwork files format and compatibility identified and confirmed in accordance with type of software.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.6 Colour temperature requirement. 1.7 Fundamentals of work area safety guidelines: • Ergonomic deportment. • Electrical equipment. • Seating/ standing duration. • Computer usage duration. 1.8 Fundamentals of environmentally sustainable work practices: • Environment, Social and Governance (ESG) concept. • Sounds/Noise. • Energy saving.			1.3 Artwork size, resolutions, image, colour, typesetting confirmed in accordance with product specifications. 1.4 Artwork setting approval status confirmed prior to editing in accordance with printing specification and SOP. <u>AFFECTIVE DOMAIN</u> 1.1 Job docket information interpreted meticulously. 1.2 Resourcefulness practice in identifying job requirements demonstrated. 1.3 IT security policy with regards to file handling adhered to. 1.4 Safety procedures in workplace adhered to. 1.5 Work area ergonomics practices adhered to. 1.6 Environmentally sustainable work practices applied in work area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• 5S Concept in housekeeping - (Sort, Set in Order, Sweep/clean, Standardize, and Sustain).			
2. Carry out Digital Artwork Setting Adjustment.	2.1 Types and related functions of artwork design software: • Illustration software. • Image editing software. • Publication software. • Artwork viewer/pre-flight software. 2.2 Types and functions of digital printing supporting tools: • Computer.	2.1 Edit digital artwork printing and cutting area. 2.2 Edit digital artwork image. 2.3 Edit digital artwork colour. 2.4 Edit digital artwork typesetting.	ATTITUDE 2.1 Meticulous in carrying out in digital artwork setting adjustment. 2.2 Resourceful in updating software. 2.3 Adhere to IT security policy with regards to file handling. SAFETY 2.1 Adhere to workplace safety procedures. 2.2 Adhere to work area ergonomics practice. ENVIRONMENT 2.1 Apply environmentally	COGNITIVE DOMAIN 2.1 Types of artwork design software listed and related functions defined. 2.2 Types and of digital printing supporting tools listed and related functions defined. 2.3 Artwork setting explained. 2.4 Artwork typesetting explained. PSYCHOMOTOR DOMAIN 2.1 Digital artwork printing and cutting area details comprised of product size, resolutions, orientation, bleed, trim line, crop mark/line and text position adjusted and confirmed in accordance with job requirements and type of software.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Removable/ external storage. • Information Technology (IT) communication tools. 2.3 Artwork setting: • Artwork printing and cutting area/crop marks. • Colour mode. • Image adjustment. 2.4 Artwork typesetting: • Typestyle. • Typeface. • Font characteristic. • File extension format.		sustainable work practices.	2.2 Digital artwork image brightness and contrast adjusted and confirmed in accordance with job requirements and job docket. 2.3 Digital artwork colour format requirement adjusted and confirmed in accordance with job requirements and job docket. 2.4 Digital artwork typesetting format (font type, size, kerning, leading etc.) adjusted and confirmed in accordance with job requirements and job docket. <u>AFFECTIVE DOMAIN</u> 2.1 Digital artwork setting adjustment carried out meticulously. 2.2 Resourcefulness practice in updating software demonstrated. 2.3 IT security policy with regards to file handling adhered to. 2.4 Safety procedures in workplace adhered to. 2.5 Work area ergonomics practices adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				2.6 Fundamentals of environmentally sustainable work practices applied in work area.
3. Carry out Final Digital Artwork Compilation.	3.1 Edited artwork compilation requirements: • Job specifications. • Artwork file setting. 3.2 Quality of job/ artwork layout: • Image. • Colour. • Type setting. • Printing area. 3.3 Pre-flight checking and reporting data: • Bleed. • Registration marks. • Rich black. • Font.	3.1 Compile edited digital artwork. 3.2 Check final digital artwork setting. 3.3 Check artwork pre-flight. 3.4 Compile final digital artworks. 3.5 Record authorised personnel approval.	ATTITUDE 3.1 Meticulous in digital artwork compilation. 3.2 Adhere to IT security policy with regards to file handling. SAFETY 3.1 Adhere to workplace safety procedures. 3.2 Adhere to work area ergonomics practice. ENVIRONMENT 3.1 Apply environmentally sustainable work practices.	COGNITIVE DOMAIN 3.1 Edited artwork compilation requirements described. 3.2 Quality of job/ artwork layout explained. 3.3 Pre-flight checking and reporting format explained. 3.4 Final artwork type compilation package and approval requirements described. PSYCHOMOTOR DOMAIN 3.1 Edited artwork files format confirmed and retrieved in accordance with job specifications. 3.2 Edited artwork setting including printing areas, image, colour and typesetting confirmed against job specifications in accordance with job requirements.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Image (link file, resolution). • Colour bar. • File size. • Page information. 3.4 Final artwork type compilation package and approval requirements: • Hardcopy (Printed copy). • Softcopy. • Client approval documentation.			3.3 Pre-flight artwork results (actual size, image and font sharpness, transparency, colour modes, etc.) confirmed in accordance with job specifications. 3.4 Pre-flight report format determined and auto-generated in accordance with software specifications. 3.5 Final digital artwork files saved and final approval status documented systematically in accordance with artwork format. <u>AFFECTIVE DOMAIN</u> 3.1 Digital artwork compilation carried out meticulously. 3.2 IT security policy with regards to file handling adhered to. 3.3 Safety procedures in workplace adhered to. 3.4 Work area ergonomics practices adhered to. 3.5 Environmentally sustainable work practices applied in work area.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.2 Perform Digital Printer Preparation.

SECTION	(C) Manufacturing		
GROUP	(181) Printing and Service Activities Related to Printing		
AREA	Digital Printing		
NOSS TITLE	Digital Printing Technical Services		
COMPETENCY UNIT TITLE	Perform Digital Printer Preparation.		
LEARNING OUTCOMES	The learning outcomes of this competency are to enable the trainees to prepare digital printer prior to printing, the activities involve in setting the printer, its accessories and substrates and to ensure its functionality and operability in accordance with printer manual and company Standard Operating Procedure (SOP). The results of these activities are the digital printer can run smoothly, meet print job requirements and achieve desired output. Upon completion of this competency unit, trainees should be able to: 1. Carry Out Digital Printing Specification Checking. 2. Organise Digital Printing Substrates. 3. Carry Out Digital Printer Server Setting. 4. Carry Out Digital Printer Setup. 5. Carry Out Printing Sample Preparations.		
TRAINING PREREQUISITE (SPECIFIC)	Not Available.		
CU CODE	C181-001-2:2023-C02	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Carry Out Digital Printing Specificati	1.1 Digital printing product specifications: • Colour.	1.1 Determine final digital artworks specifications.	<u>ATTITUDE</u> 1.1 Meticulous in carrying out file setting.	<u>COGNITIVE DOMAIN</u> 1.1 Digital printing product specifications explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
on Checking.	• Size. • Type of finishing. 1.2 Element in tools design applications: • Artwork setting. • File format. 1.3 Job docket information: • Job order details. • Product specification. • Product finishing. 1.4 Digital printer specification: • Type of printer. • Type of ink. • Type of digital Raster Image Processing (RIP) software.	1.2 Check digital printing software. 1.3 Check digital printing substrates. 1.4 Check printing finishing specifications.	1.2 Ensure file free from any security and privacy computer thread. 1.3 Adhere to IT and copyright security policy with regards to file handling. <u>SAFETY</u> 1.1 Adhere to workplace safety procedures. 1.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 1.1 Apply environmentally sustainable work practices.	1.2 Element in tools design applications explained. 1.3 Job docket information described. 1.4 Digital printer specification explained. 1.5 Checking checklist format explained. 1.6 Fundamentals of work area safety guidelines explained. 1.7 Fundamentals of environmentally sustainable work practices defined and interpreted. <u>PSYCHOMOTOR DOMAIN</u> 1.1 Final digital artwork specification reviewed and confirmed in accordance with job specifications and type of printers. 1.2 Digital printing software format confirmed in accordance with job specifications and type of printer.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.5 Checking checklist format. 1.6 Fundamentals of work area safety guidelines: • Ergonomic deportment. • Electrical equipment. • Seating/ standing duration. • Computer usage duration. 1.7 Fundamentals of environmentally sustainable work practices: • Environment, Social and Governance (ESG) concept.			1.3 Printing substrate specifications (size, thickness/grammage, etc.) and types such as paper, glass, canvas, metal, fabric, marble, and plastic confirmed in accordance with job specifications. 1.4 Printing finishing parameter details confirmed in accordance with job specifications and type of machine. <u>AFFECTIVE DOMAIN</u> 1.1 File setting carried out meticulously. 1.2 File free from any security and privacy computer thread confirmed. 1.3 IT and copyright security policy with regard to file handling adhered to. 1.4 Safety procedures in workplace adhered to. 1.5 Work area ergonomics practices adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Sounds/ Noise. • Energy saving. • 5S Concept in housekeeping - (Sort, Set in Order, Sweep/clean, Standardize, an.			1.6 Environmentally sustainable work practices applied in work area.
2. Organise Digital Printing Substrates.	2.1 Type of substrates: • Paper. • Sticker. • Tarpaulin. • Canvas. • Plastic. • Synthetic paper. 2.2 Substrates specifications: • Grammage. • Size. • Roll. • Sheet.	2.1 Collect printing substrates. 2.2 Check substrates specification. 2.3 Arrange printing substrates.	<u>ATTITUDE</u> 2.1 Well organised when handling digital substrates. 2.2 Mindful in handling printing and finishing materials. <u>SAFETY</u> 2.1 Adhere to workplace safety procedures. 2.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u>	<u>COGNITIVE DOMAIN</u> 2.1 Type of substrates listed. 2.2 Substrates specifications explained. 2.3 Substrates arrangement procedure, method and technique described. <u>PSYCHOMOTOR DOMAIN</u> 2.1 Printing substrates stores/location/sources confirmed and obtained in accordance with job specifications and SOP sample. 2.2 Substrates specification (types, sizes, specialty) type confirmed

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Thickness. • Grain direction. • Texture. 2.3 Substrates arrangement procedure, method and technique.		2.1 Apply environmentally sustainable work practices.	in accordance with job specifications. 2.3 Printing substrates categorized in accordance with job specifications. 2.4 Printing substrates placed correctly, and orientation confirmed based on type of machines in accordance with machine SOP. <u>AFFECTIVE DOMAIN</u> 2.1 Digital substrates well organised. 2.2 Printing and finishing materials handled mindfully. 2.3 Safety procedures in workplace adhered to. 2.4 Work area ergonomics practices adhered to. 2.5 Environmentally sustainable work practices applied in work area.
3. Carry Out Digital Printer Server Setting.	3.1 Server setting manual. 3.2 Digital printer colour profile.	3.1 Determine printer server software. 3.2 Set impositioning layout.	<u>ATTITUDE</u> 3.1 Meticulous in setting server parameters.	<u>COGNITIVE DOMAIN</u> 3.1 Server setting manual explained. 3.2 Digital printer colour profile explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	3.3 Types of colour modes: • CMYK. • RGB. • Grayscale. 3.4 Types of image adjustment: • Contrast. • Brightness. • Hue. • Saturation. 3.5 Colour profile setting procedure. 3.6 Resolution setting procedure. 3.7 Substrate parameter setting procedure. 3.8 Feeding setup procedure. 3.9 Types of impositioning layout: • 2 up or 4 up.	3.3 Set digital printer colour profile. 3.4 Select digital printer resolution. 3.5 Set substrates parameter. 3.6 Set up digital printer feeding. 3.7 Set up digital printer's finishing parameter.	3.2 Systematic in carrying out server setting parameters. SAFETY 3.1 Adhere to workplace safety procedures. 3.2 Adhere to work area ergonomics practice. ENVIRONMENT 3.1 Apply environmentally sustainable work practices.	3.3 Types of colour modes listed and explained. 3.4 Types of image adjustment described. 3.5 Colour profile setting procedure explained. 3.6 Resolution setting procedure explained. 3.7 Substrate parameter setting procedure explained. 3.8 Feeding setup procedure explained. 3.9 Types of impositioning layout described. 3.10 Digital printer's finishing parameter explained. PSYCHOMOTOR DOMAIN 3.1 Type of printer server software and interface identified in accordance with printer server user manual. 3.2 Impositioning layout setting executed and confirmed in accordance with job specifications and printer manual. 3.3 Digital printer colour profile (FOGRA/UGRA/ISO/US Web

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Single-sided. • Double-sided. 3.10 Digital printer's finishing parameter.			Coated/GraCol) setting executed and confirmed in accordance with job specifications and printer manual. 3.4 Digital printer resolution setting confirmed in accordance with job specifications and printer manual. 3.5 Digital printer substrates parameter setting executed and confirmed in accordance with job specifications and printer manual. 3.6 Digital printer feeding setting executed and confirmed in accordance with job specifications and printer manual. 3.7 Digital printer's finishing parameter setting executed and confirmed in accordance with job specifications and printer's manual. <u>AFFECTIVE DOMAIN</u> 3.1 Server setting parameters executed meticulously.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				3.2 Server setting parameters executed systematically. 3.3 Safety procedures in workplace adhered to. 3.4 Work area ergonomics practices adhered to. 3.5 Environmentally sustainable work practices applied in work area.
4. Carry Out Digital Printer Setup.	4.1 Safety procedures on printer setup. 4.2 Safety, Health and Environmental (SHE) practises guidelines: • OSHA. • Environmental Quality Act 1974 (Act127). • Material Safety Data Sheet (MSDS).	4.1 Interpret printer safety procedures. 4.2 Key in substrates specification onto printer setting. 4.3 Set up toner/ ink and other related consumables. 4.4 Set up substrates. 4.5 Check printer setup readiness.	ATTITUDE 4.1 Systematic in carrying out printer setup. 4.2 Handle printer and substrates with care. SAFETY 4.1 Adhere to workplace safety procedures. 4.2 Adhere to work area ergonomics practice. ENVIRONMENT 4.1 Apply environmentally sustainable work practices.	COGNITIVE DOMAIN 4.1 Safety procedures on printer set-up explained. 4.2 Safety, Health and Environmental (SHE) practise guidelines explained. 4.3 Regulatory body/agency related to working compliance explained. 4.4 Types of printing material and specifications explained. 4.5 Types of inline finishing listed. PSYCHOMOTOR DOMAIN 4.1 Safety procedures (Personnel Protective Equipment (PPE), electrical, work area, equipment/tools, etc.) determined in accordance with

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Product Safety Data Sheet (PSDS). 4.3 Regulatory body/agency related to working compliance: • Malaysian Communication Multimedia Commissions (MCMC). • Fire department. • Department of Environment (DOE). • Department of Occupational Safety and Health (DOSH).			Safety, Health and Environment guidelines (SHE). 4.2 Substrates specification input confirmed into printer setting interface in accordance with job specifications. 4.3 Toner/ ink and other related consumables (replenisher, storage fluid, etc.) setup confirmed in accordance with job docket and printer manual. 4.4 Substrates setting parameters accuracy confirmed in accordance with job docket and printer manual. 4.5 Printer functionality and operability confirmed in accordance with printer manual. <u>AFFECTIVE DOMAIN</u> 4.1 Printer setup executed systematically. 4.2 Printer and substrates handled with care. 4.3 Safety procedures in workplace adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	4.4 Types of printing material and specification: • Types of substrate. • Size. • Thickness. • Grammage. • Grain direction. • Types of consumables. 4.5 Types of inline finishing: • Folding. • Ring binding. • Stapling. • Stacking. • Cutting and trimming. • Stitching. • Punching. • Hole drilling. • Booklet making.			4.4 Work area ergonomics practices adhered to. 4.5 Environmentally sustainable work practices applied in work area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Perfect binding.			
5. Carry Out Printing Sample Preparations.	5.1 Digital printer operating procedure. 5.2 Safety procedures in printing process. 5.3 Printing sample preparation procedure. 5.4 Criteria for proofing sampling: • Pagination. • Text. • Image. • Size. • Colour. • Resolution. • Registration.	5.1 Interpret job docket. 5.2 Interpret safety procedures in printing process. 5.3 Produce sample print. 5.4 Check sample print. 5.5 Acquire sample print approval.	<u>ATTITUDE</u> 5.1 Meticulous in checking sample print. 5.2 Decisive in determining proofing criteria <u>SAFETY</u> 5.1 Adhere to workplace safety procedures. 5.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 5.1 Minimise substrate wastage. 5.2 Apply environmentally sustainable work practices.	<u>COGNITIVE DOMAIN</u> 5.1 Digital printer operating procedure described. 5.2 Safety procedures on printing process defined and explained. 5.3 Printing sample preparation procedure described. 5.4 Criteria for proofing sampling explained. 5.5 Sample print approval procedure described. <u>PSYCHOMOTOR DOMAIN</u> 5.1 Printing specification including special printing instructions, colour or quantity determined based on job docket. 5.2 Printing process safety and environmental procedure adhered to in accordance with Safety, Health and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Orientation. • Positioning. • Types of substrate. • Sharpness. 5.5 Sample print approval procedure.			Environment guidelines (SHE) and manufacturer SOP. 5.3 Sample printouts' clarity, sharpness and actual size confirmed in accordance with job docket. 5.4 Sample print and proof conformed in accordance with job docket and specification. 5.5 Printed sample results including image, size, resolution font type, colour brightness and sharpness approved and documented in accordance with company SOP sample. <u>AFFECTIVE DOMAIN</u> 5.1 Printed sample checked meticulously. 5.2 Proofing criteria determined decisively. 5.3 Safety procedures in workplace adhered to. 5.4 Substrate wastage minimised economically. 5.5 Work area ergonomics practices adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				5.6 Environmentally sustainable work practices applied in work area.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.3 Perform Digital Printing Process.

SECTION	(C) Manufacturing		
GROUP	(181) Printing and Service Activities Related to Printing		
AREA	Digital Printing		
NOSS TITLE	Digital Printing Technical Services		
COMPETENCY UNIT TITLE	Perform Digital Printing Process.		
LEARNING OUTCOMES	The learning outcomes of this competency are to enable the trainees to fulfil production targets in terms of print quality, output volume, printer uptime and delivery deadlines by executing digital printing operation processes in accordance with printer manual and company Standard Operating Procedure (SOP). Upon completion of this competency unit, trainees should be able to: 1. Carry out Digital Printer Start Up. 2. Carry Out Product Printing. 3. Carry Out Digital Printing Quality Inspection. 4. Carry Out Product Finishing Process. 5. Carry Out Housekeeping Practice.		
TRAINING PREREQUISITE (SPECIFIC)	Not Available.		
CU CODE	C181-001-2:2023-C03	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Carry out Digital Printer Start Up.	1.1 Type of digital printer category: • Digital press. • Inkjet printer.	1.1 Check visually digital printer surrounding. 1.2 Interpret digital printer start-up procedure.	ATTITUDE 1.1 Responsive in checking digital printer start-up. 1.2 Handle digital printer with care.	COGNITIVE DOMAIN 1.1 Type of digital printer category listed and explained. 1.2 Digital printer specification explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.2 Digital printer specification: • Various types of ink. • Drier. • Print heater temperature. • Digital cutter. 1.3 Safety procedures on digital printer set -up process. 1.4 Digital printer start-up procedures. 1.5 Potential hazards of working environments: • Surrounding area blockage. • Leaks or spillages. • Printer temperature. 1.6 Digital printer standard operating	1.3 Check digital printer temperature. 1.4 Observe digital printer condition status on printer display.	1.3 Integrity in performing job requirements. <u>SAFETY</u> 1.1 Adhere to workplace safety procedures. 1.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 1.1 Apply environmentally sustainable work practices.	1.3 Safety procedures on digital printer setup process described. 1.4 Digital printer start-up procedure described. 1.5 Potential hazards of working environments explained. 1.6 Digital printer standard operating condition on printer display explained. 1.7 Documentation/recording format explained. 1.8 Printer condition reporting procedure described. 1.9 Fundamentals of work area safety guidelines explained. 1.10 Fundamentals of environmentally sustainable work practices defined and interpreted. <u>PSYCHOMOTOR DOMAIN</u> 1.1 Digital printer surrounding (temperature, humidity, lights) and conditions confirmed free from failure/potential risk in accordance with safety procedures.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	condition on printer display: • Machine ability. • Machine abnormality. 1.7 Documentation/ recording format. 1.8 Printer condition reporting procedure. 1.9 Fundamentals of work area safety guidelines: • Ergonomic deportment. • Electrical equipment. • Seating/ standing duration. • Computer usage duration. 1.10 Fundamentals of environmentally sustainable work practices:			1.2 Digital printer operability and functions confirmed, and safety procedures adhered to in accordance with production SOP sample and printer manual. 1.3 Digital printer ink/drier/print heater temperature confirmed in accordance with printer specification and type of printer. 1.4 Digital printer condition including printer component checked, abnormalities (error warning, malfunction, failure) messages confirmed, documented and reported in accordance with type of machines and printer standard. <u>AFFECTIVE DOMAIN</u> 1.1 Digital printer start-up checked responsively. 1.2 Digital printer handled with care. 1.3 Safety procedures in workplace adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Environment, Social and Governance (ESG) concept. • Sounds/ Noise. • Energy saving. 5S Concept in housekeeping - (Sort, Set in Order, Sweep/clean, Standardize, and Sustain).			1.4 Integrity practices demonstrated in job requirements. 1.5 Work area ergonomics practices adhered to. 1.6 Environmentally sustainable work practices applied in work area.
2. Carry Out Product Printing.	2.1 Safety procedures on printing process. 2.2 Printing substrates readiness checking method. 2.3 Production approval documentation format.	2.1 Check printing substrates readiness. 2.2 Check production approval status. 2.3 Check quantity against order/ deadline. 2.4 Execute printing works. 2.5 Execute inline post-printing works.	<u>ATTITUDE</u> 2.1 Meticulous in checking production status. 2.2 Responsive in handling printer malfunction. <u>SAFETY</u> 2.1 Adhere to workplace safety procedures.	<u>COGNITIVE DOMAIN</u> 2.1 Safety procedures on printing process explained. 2.2 Printing substrates readiness checking method described. 2.3 Production approval documentation format explained. 2.4 Procedure and technique of monitoring printing works described.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	2.4 Procedure and technique of monitoring printing works. • Consumables sufficiency. • Substrate sufficiency. • Condition of printer. • Printing status. • Quality output. • Quantity output. 2.5 Procedure and technique of monitoring inline post-printing: • Folding. • Ring binding. • Stapling. • Stacking. • Cutting and trimming. • Stitching. • Punching.	2.6 Handle digital printer malfunction. 2.7 Update production monitoring checklist.	2.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 2.1 Apply environmentally sustainable work practices.	2.5 Procedure and technique of monitoring inline post-printing described. 2.6 Interpretation of common error and warning message or abnormalities on printer explained. 2.7 Production monitoring checklist explained. <u>PSYCHOMOTOR DOMAIN</u> 2.1 Type of printing substrates such as paper, plastic, tarpaulin setup in accordance with job specifications. 2.2 Production approval status confirmed in accordance with targeted planning. 2.3 Number of printed copies/products/pieces confirmed in accordance with targeted planning. 2.4 Printing output cleaned, sharped and precisely produced in accordance with job docket and printing specification. 2.5 Inline post-printing activities such as folding, stacking,

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Hole drilling. • Booklet making. • Perfect binding. 2.6 Interpretation of common error and warning message or abnormalities on printer. 2.7 Production monitoring checklist.			binding, trimming, punching completed in accordance with job docket. 2.6 Printer faulty/ production problems (paper jammed, no colour, smear, ghosting, etc.) and cause identified in accordance with printer manual. 2.7 Printer faulty/ production minor issues rectified in accordance with printer manual. 2.8 Printer drum monitored and regularly emptied in accordance with printer user manual. 2.9 Production monitoring checklist format confirmed and completed in accordance with format/system. <u>AFFECTIVE DOMAIN</u> 2.1 Production status checked meticulously. 2.2 Printer malfunction handled responsively. 2.3 Safety procedures in workplace adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				2.4 Work area ergonomics practices adhered to. 2.5 Environmentally sustainable work practices applied in work area.
3. Carry Out Digital Printing Quality Inspection.	3.1 Quality inspection procedure. 3.2 Quality inspection checklist. 3.3 Printing quality elements: • Colour density. • Image registration. • Image resolution. • Image quality. • Streaking. • Inline post-printing output. 3.4 Non-conformance quality criteria:	3.1 Interpret quality inspection procedure. 3.2 Check finished printing quality. 3.3 Identify print quality non-conformance. 3.4 Rectify print quality non-conformance. 3.5 Update quality checklist.	ATTITUDE 3.1 Alert in identifying print quality non-conformance. 3.2 Detail in checking printing quality constantly. SAFETY 3.1 Adhere to workplace safety procedures. 3.2 Adhere to work area ergonomics practice. ENVIRONMENT 3.1 Apply environmentally sustainable work practices.	COGNITIVE DOMAIN 3.1 Quality inspection procedure described. 3.2 Quality inspection checklist explained. 3.3 Printing quality elements listed. 3.4 Non-conformance quality criteria explained. 3.5 Inspection tools listed and functions explained. PSYCHOMOTOR DOMAIN 3.1 Printing quality inspection procedure and standards determined in accordance job specifications. 3.2 Printing quality standard interpreted, and status confirmed in accordance with job specifications. 3.3 Print quality non-conformance results (smears,

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Smears. • Scumming. • Colour variations. 3.5 Inspection tools and functions: • Densitometer. • Spectrophoto meter. • Magnifier glass. • Measurement device.			scumming, Colour variations) identified in accordance with quality standards. 3.4 Printing defects (smears, scumming, bleeding, Colour variation, ghosting, etc.) corrected in accordance with quality standards. 3.5 Quality checklist accuracy confirmed and completed in accordance with checklist format/recording system. <u>AFFECTIVE DOMAIN</u> 3.1 Alertness in print quality non-conformance identifying demonstrated. 3.2 Printing quality constantly checked in detail. 3.3 Safety procedures in workplace adhered to. 3.4 Work area ergonomics practices adhered to. 3.5 Environmentally sustainable work practices applied in work area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
4. Carry Out Product Finishing Process.	4.1 Type of finishing processes. • Varnishing. • Laminating. • Coating. • Cutting. 4.2 Product finishing machine setup procedure. 4.3 Monitoring finishing process procedures and technique. 4.4 Final finishing process output inspection procedure. 4.5 Finished product storage requirements: • Humidity. • Lighting exposure. • Temperature. • Racking system. • Labelling system.	4.1 Determine finishing processes. 4.2 Set up product finishing machine. 4.3 Execute finishing processes. 4.4 Inspect final finishing process output. 4.5 Execute finished product storage.	ATTITUDE 4.1 Meticulous in checking product finishing process. 4.2 Responsive in handling finished product storage. SAFETY 4.1 Adhere to workplace safety procedures. 4.2 Adhere to work area ergonomics practice. ENVIRONMENT 4.1 Apply environmentally sustainable work practices.	COGNITIVE DOMAIN 4.1 Type of finishing processes listed and explained. 4.2 Product finishing machine setup procedure described. 4.3 Monitoring finishing process procedures and technique described. 4.4 Final finishing process output inspection procedure described. 4.5 Finished product storage requirements described. 4.6 Finished product storing procedure described. PSYCHOMOTOR DOMAIN 4.1 Type of finishing process such as varnishing, laminating and coating confirmed in accordance with job specifications. 4.2 Product finishing machine parameter setup and readiness confirmed in accordance with type of finishing process.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Packaging system. • Product condition safety. 4.6 Finished product storing procedure: • Last in first out (LIFO). • First in first out (FIFO).			4.3 Finishing process completed including cutting process (trim to size/die cut) completed in accordance with job specifications 4.4 Final finishing product's colour, text area, logos, graphics etc. accurately printed in accordance with quality standards. 4.5 Finished product arranged systematically and stored safely in accordance with type of product and production SOP sample . <u>AFFECTIVE DOMAIN</u> 4.1 Product finishing process checked meticulously. 4.2 Finished product storage handled responsively. 4.3 Safety procedures in workplace adhered to. 4.4 Work area ergonomics practices adhered to. 4.5 Environmentally sustainable work practices applied in work area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
5. Carry Out Housekeeping Practice.	5.1 Housekeeping schedule format. 5.2 Digital printer cleaning procedure and method: • Purging print head. • Cleaning paper path. • Cleaning sensor. • Empty waste container. 5.3 Type of cleaning tools equipment and materials. • Cleaning solvent. • Brushes. • Air suction. • Dry cloth. 5.4 Manufacturer operation manual. 5.5 Housekeeping checklist format.	5.1 Identify housekeeping schedule and cleaning procedure. 5.2 Select cleaning tools, equipment, and materials. 5.3 Arrange workplace. 5.4 Handle waste and hazardous material keeping/disposal activities. 5.5 Clean up related modules of digital printers. 5.6 Update housekeeping checklist/ logbook.	<u>ATTITUDE</u> 5.1 Efficiency in carrying out housekeeping practice. 5.2 Systematic in carrying out housekeeping activities. <u>SAFETY</u> 5.1 Adhere to safety procedures when handling hazardous material. 5.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 5.1 Apply environmentally sustainable work practices.	<u>COGNITIVE DOMAIN</u> 5.1 Housekeeping schedule format explained. 5.2 Digital printer cleaning procedure and method described. 5.3 Type of cleaning tools equipment and materials listed. 5.4 Manufacturer operation manual explained. 5.5 Housekeeping checklist format explained. 5.6 Housekeeping practises explained. <u>PSYCHOMOTOR DOMAIN</u> 5.1 Housekeeping schedule and procedure including date, time and method identified in accordance with housekeeping SOP sample. 5.2 Cleaning tools, equipment and materials arranged systematically in accordance with cleaning requirements and procedures.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	5.6 Housekeeping practises: • 5S methodology (sort, set in order, shine, standardize, and sustain). • Green environmental .			5.3 Workplace neatness, cleanliness and 5S methodology applied in accordance with housekeeping requirements. 5.4 Waste and hazardous materials handled, stored or disposed of in accordance with statutory/ regulatory bodies requirements. 5.5 Related modules (input module, imaging module, interface module, finishing module) of digital printers cleaned up in accordance with production SOP sample. 5.6 Housekeeping checklist/ logbook accuracy confirmed and completed in accordance with job requirements. <u>AFFECTIVE DOMAIN</u> 5.1 Housekeeping executed efficiently. 5.2 Housekeeping activities carried out systematically. 5.3 Safety procedures when handling hazardous materials in workplace adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				5.4 Work area ergonomics practices adhered to. 5.5 Environmentally sustainable work practices applied in work area.

Employability Skills

Core Abilities

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Social Values & Social Skills

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9 Rahim M. Sail. et al. 2007. Handbook on Social Skills and Social Values in Technical Education and Vocational Training, 2nd Edition 2007. Serdang. Department of Skills Development (DSD). ISBN: 9789675026218.

15.4 Perform Digital Printer Routine Maintenance.

SECTION	(C) Manufacturing		
GROUP	(181) Printing and Service Activities Related to Printing		
AREA	Digital Printing		
NOSS TITLE	Digital Printing Technical Services		
COMPETENCY UNIT TITLE	Perform Digital Printer Routine Maintenance.		
LEARNING OUTCOMES	The learning outcomes of this competency are to enable the trainees to perform on a regular, specified and ongoing basis in order to ensure that digital printer is kept in running condition. This will result the production running smoothly and prevent unplanned downtime in accordance with maintenance schedule, job timeline and company Standard Operating Procedure (SOP). Upon completion of this competency unit, trainees should be able to: 1. Prepare Digital Printer Routine Maintenance Requirements. 2. Carry Out Digital Printer Servicing. 3. Carry Out Digital Printer Calibration. 4. Update Digital Printer Routine Maintenance Record.		
TRAINING PREREQUISITE (SPECIFIC)	Not Available.		
CU CODE	C181-001-2:2023-C04	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Prepare Digital Printer Routine Maintenance	1.1 Maintenance schedule information: • Schedule format.	1.1 Interpret maintenance schedule. 1.2 Identify type of digital printer's maintenance part.	ATTITUDE 1.1 Thorough in checking machine routine maintenance scope of work.	COGNITIVE DOMAIN 1.1 Maintenance schedule information explained. 1.2 Type of digital printer part to be maintained listed.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
Requirements.	• Periodical maintenance. • Machine information. 1.2 Type of digital printer's part to be maintained: • Drum. • Inkjet head. • Laser head. • Transport path. • Rollers. 1.3 Type of machine maintenance: • Preventive. • Predictive. 1.4 Scope of work for routine maintenance: • Nozzle checking. • Head cleaning. • Ink purging. • Cartridge replacement.	1.3 Check routine maintenance scope of work. 1.4 Organise maintenance tools and materials.	1.2 Meticulous in interpreting maintenance schedule requirements. <u>SAFETY</u> 1.1 Adhere to safety procedures when performing digital printer routine maintenance. 1.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 1.1 Apply environmentally sustainable work practices.	1.3 Type of machine maintenance listed. 1.4 Scope of work for routine maintenance explained. 1.5 Machine maintenance tools listed and function described. 1.6 Types of machine maintenance materials listed. 1.7 Fundamentals of work area safety guidelines explained. 1.8 Fundamentals of environmentally sustainable work practices defined and interpreted. <u>PSYCHOMOTOR DOMAIN</u> 1.1 Routine maintenance schedule format, date, day, time and printer location confirmed in accordance with printer manual. 1.2 Type of digital printer's part to be maintained or servicing identified in accordance with maintenance schedule and visual check.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Ink replenishing. 1.5 Machine maintenance tools and function: • Adjustable spanner. • Allen keys. • Screwdriver. • Special tools. 1.6 Types machine of maintenance materials: • Lint-free cloth. • Cotton. • Sponge. • Cleaning solution. 1.7 Fundamentals of work area safety guidelines: • Ergonomic deportment. • Electrical equipment.			1.3 Scope of work inclusive type of routine maintenance confirmed in accordance with production SOP sample and servicing procedure. 1.4 Maintenance tools and materials suitability confirmed and arranged safely in accordance with printer manual. <u>AFFECTIVE DOMAIN</u> 1.1 Machine routine maintenance scope of work checked thoroughly. 1.2 Maintenance schedule requirements interpreted meticulously. 1.3 Safety procedures when performing digital printer routine maintenance adhered to. 1.4 Work area ergonomics practices adhered to. 1.5 Environmentally sustainable work practices applied in work area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Seating/ standing duration. • Computer usage duration. 1.8 Fundamentals of environmentally sustainable work practices: • Environment, Social and Governance (ESG) concept. • Sounds/ Noise. • Energy saving. 5S Concept in housekeeping - (Sort, Set in Order, Sweep/clean, Standardize, and Sustain).			

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
2. Carry Out Digital Printer Servicing.	2.1 Digital printer routine maintenance safety and environmental procedure: • Utilization of Personal Protective Equipment (PPE). • Reduce, Recycle, Reuse (3R) practices. 2.2 Disassemble and assemble printer parts procedure. 2.3 Maintenance procedures: • Printer checking procedure. • Printer cleaning procedure.	2.1 Interpret safety and environmental procedure. 2.2 Disassemble equipment parts. 2.3 Check related printer components. 2.4 Service related printer components. 2.5 Purge related printer components. 2.6 Check digital printer wear and tear components. 2.7 Replace faulty/wear & tear/broken consumables items or parts. 2.8 Assemble equipment parts. 2.9 Check digital printer functionality. 2.10 Test run digital printer.	<u>ATTITUDE</u> 2.1 Systematic in carrying out digital printer servicing. 2.2 Meticulous in checking digital printer components wear and tear. 2.3 Handle digital printer parts with care. <u>SAFETY</u> 2.1 Adhere to safety procedures when performing digital printer servicing. 2.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 2.1 Apply environmentally sustainable work practices.	<u>COGNITIVE DOMAIN</u> 2.1 Digital printer routine maintenance safety and environmental procedure described. 2.2 Disassemble and assemble printer parts procedure described. 2.3 Maintenance procedures described. 2.4 Type of digital printer reference listed. <u>PSYCHOMOTOR DOMAIN</u> 2.1 Safety and environmental procedure identified in accordance with SHE guidelines and printer manuals. 2.2 Equipment parts dislocated, separated and kept safely in accordance with printer manual. 2.3 Related printer components such as roller, blades to be serviced confirmed in accordance with printer manual. 2.4 Related printer components such as roller, blades

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Printer purging procedure. • Printer consumables and parts replacement procedure. 2.4 Type of digital printer reference: • Printer manual. • Test chart.			cleaned/greased and wiped in accordance with printer manual. 2.5 Related printer components such as nozzles recovered and printer unblocked in accordance with purging method and printer manual. 2.6 Digital printer components wear and tear conditions identified in accordance with printer manual. 2.7 Faulty/wear & tear/broken related component (consumables items or parts) replaced in accordance with printer manual. 2.8 Equipment parts joined, fastened and assembled equipment checked in accordance with printer manual. 2.9 Digital printer functionality confirmed and tested in accordance with printer manual. 2.10 Test chart output confirmed in accordance with printer specification.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				AFFECTIVE DOMAIN 2.1 Digital printer servicing executed systematically. 2.2 Digital printer components wear and tear checked meticulously. 2.3 Digital printer parts carefully handled. 2.4 Safety procedures when performing digital printer servicing adhered to. 2.5 Work area ergonomics practices adhered to. 2.6 Environmentally sustainable work practices applied in work area.
3. Carry Out Digital Printer Calibration.	3.1 Basic colour management: • Colour standard. • Colour matching. • Colour measurement. 3.2 Calibration test chart:	3.1 Print out calibration test chart. 3.2 Execute scanning and/ or measurement processes. 3.3 Update calibrated values into digital printer server. 3.4 Reprint test chart. 3.5 Check revised test chart within limit.	ATTITUDE 3.1 Meticulous in calibrating digital printer. SAFETY 3.1 Adhere to safety procedures when calibrating digital printer.	COGNITIVE DOMAIN 3.1 Basic colour management described. 3.2 Calibration test chart explained. 3.3 Type of calibration tools and function listed and explained. 3.4 Printer calibration procedure described. PSYCHOMOTOR DOMAIN

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Colour patch. • Colour stripes. 3.3 Type of Calibration tools and function: • Calibration instruments and accessories. • Calibration application. 3.4 Printer calibration procedure: • Ink density. • Image registration. • Image alignment. • Front-to-back/ duplex alignment. • Colour calibration proofing (if applicable).		3.2 Adhere to work area ergonomics practice. <u>ENVIRONMENT</u> 3.1 Apply environmentally sustainable work practices.	3.1 Calibration test chart (colour patch/stripes) produced in accordance with printer manual and type of printers. 3.2 Scanning and/ or measurement processes executed in accordance with printer manual. 3.3 Calibration measured values updated into digital printer server in accordance with printer manual and colour standard. 3.4 Revised test chart output confirmed in accordance with printer specification. 3.5 Calibration values confirmed against the target values/within limit/tolerance in accordance with printer manual and colour standard. <u>AFFECTIVE DOMAIN</u> 3.1 Digital printer calibrated meticulously. 3.2 Safety procedures when calibrating digital printer adhered to.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				3.3 Work area ergonomics practices adhered to. 3.4 Environmentally sustainable work practices applied in work area.
4. Update Digital Printer Routine Maintenance Record.	4.1 Maintenance activities status. 4.2 Maintenance record format: • Logbook. • Checklist. 4.3 Maintenance recording system. 4.4 Maintenance documentation procedure: • Filing. • Indexing.	4.1 Determine maintenance status. 4.2 Update digital printer routine maintenance records. 4.3 Compile digital printer routine maintenance records. 4.4 Notify maintenance status to relevant parties.	ATTITUDE 4.1 Clear and precise in recording maintenance activities. 4.2 Honest in updating maintenance record. 4.3 Timely in updating maintenance record. SAFETY 4.1 Adhere to workplace safety procedures. 4.2 Adhere to work area ergonomics practice. ENVIRONMENT 4.1 Apply environmentally sustainable work practices.	COGNITIVE DOMAIN 4.1 Maintenance activities status explained. 4.2 Maintenance record format explained. 4.3 Maintenance recording system explained. 4.4 Maintenance documentation procedure described. PSYCHOMOTOR DOMAIN 4.1 Digital printer routine maintenance date, day, type of printers and maintained components/area confirmed in accordance with production SOP sample. 4.2 Digital printer routine maintenance content accuracy and adequacy confirmed and records completed in accordance with recording system.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				4.3 Updated records arranged systematically in accordance with filing procedure. 4.4 Digital printer routine maintenance records accuracy and adequacy confirmed and delivered to relevant parties in accordance with documentation procedure and format. <u>AFFECTIVE DOMAIN</u> 4.1 Maintenance activities recorded clearly and precisely. 4.2 Maintenance record updated honestly. 4.3 Maintenance record updated in timely manner. 4.4 Safety procedures when calibrating digital printer adhered to. 4.5 Work area ergonomics practices adhered to. 4.6 Environmentally sustainable work practices applied in work area.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

References for Learning Material Development

1. 14 printer maintenance tips (no date) Xerox. Available at: https://www.xerox.com/en-us/office/insights/printer-maintenance (Accessed: December 12, 2022).
2. Abdullah, M.F. (2020) *Teknologi Percetakan Digital*. Cheras, Selangor: Arena Educational Supply. ISBN: 9789672053996; 9789672369042.
3. Department of Skills Development (DSD). 2015. Z-009-1:2015 NCS-Core Abilities. Putrajaya: Department of Skills Development (DSD).
4. Department of Skills Development (DSD). 2015. Z-009-2:2015 NCS-Core Abilities. Putrajaya: Department of Skills Development (DSD).
5. Helmut Kipphan, (2001) Springer-Verlag Berlin Heidelberg New York, Handbook of Print Media: Technologies and Production Method.ISBN 13:9783540673262.
6. Printer Maintenance Checklist: How to maintain Laser Printers (2022) Teksetra. Available at: https://teksetra.com/resources/printer-maintenance-checklist/ (Accessed: December 12, 2022).
7. Rahim M. Sail. et al. 2007. Handbook on Social Skills and Social Values in Technical Education and Vocational Training, 2nd Edition 2007. Serdang. Department of Skills Development (DSD). ISBN: 9789675026218.
8. Rizzo, K.E. (2008) Total production maintenance: A guide for the printing industry. Pittsburgh: PIA/GATFPress. ISBN: 9780883626207.

16. Delivery Mode

The following are the **recommended** training delivery modes: -

KNOWLEDGE	SKILL
• Lecture • Group discussion • E-learning, self-paced • E-learning, facilitate • Case study or Problem based learning (PBL) • Self-paced learning, non-electronic • One-on-one tutorial • Shop talk • Seminar	• Demonstration • Simulation • Project • Scenario based training (SBT) • Role play • Coaching • Observation • Mentoring

Skills training and skills assessment of trainees should be implemented in accordance with TEM requirements and actual situation.

17. Tools, Equipment and Materials (TEM)

DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

CU	CU CODE	COMPETENCY UNIT TITLE
C01	C181-001-2:2023-C01	Carry Out Artwork Setting Finalization.
C02	C181-001-2:2023-C02	Perform Digital Printer Preparation.
C03	C181-001-2:2023-C03	Perform Digital Printing Process.
C04	C181-001-2:2023-C04	Perform Digital Printer Routine Maintenance.

***** Items listed refer to TEM's **minimum requirement** for skills delivery only.

NO.	ITEM*	RATIO (TEM : Trainees or AR = As Required)			
		C01	C02	C03	C04
A. Tools					
1	Magnifier glass	1:1	1:1	1:1	1:1
2	Cleaning tools (High efficiency particulate air (HEPA) vacuum, broom, mop, etc.)			1:25	1:25
3	Environmental Quality Act 1974 (Act127)	1:1	1:1	1:1	1:1
4	Log book and checklist		1:25	1:25	1:25
5	Machine maintenance tools (Adjustable spanner, Allen keys, screw drivers, special tools, etc.)				1:15

6	Machine manufacturing manual			1:25	1:25
7	Material Safety Data Sheet (MSDS		1:1	1:1	1:1
8	Measurement tools (Spectrometer, Densitometer, Steel ruler, light table, etc.)		1:15	1:15	1:15
9	Occupational Safety and Health Act	1:1	1:1	1:1	1:1
10	Page layout / Design software	1:1	1:1	1:1	1:1
11	Personal Protective Equipment (goggles, face mask, hand gloves, ear plug, safety shoes, apron, etc.)	1:1	1:1	1:1	1:1
12	Printer manual	1:25	1:25	1:25	1:25
13	Product Safety Data Sheet (PSDS)		1:1	1:1	1:1
14	Sample of job docket	1:1	1:1	1:1	1:1
15	Sample of production SOP	1:1	1:1	1:1	1:1
B. Equipment					
1	Computer	1:1	1:1	1:1	1:1
2	Digital Printer (Inkjet/LaserJet/Digital Press)	1:25	1:25	1:25	1:25
3	Finishing machine (Binder, trimmer, cutter, folder, puncher, etc)			1:25	1:25

4	Heavy duty rack			1:25	1:25
5	Network connectivity (LAN, WAN)	1:25	1:25	1:25	1:25
6	Roll rack			1:25	1:25
C. Materials					
1	Cleaning materials (lint-free cloth, cotton, sponge, solution, etc.)			AR	AR
2	Finishing material (Stapler, glue, varnish, thread, rope, combinding, etc.)		AR	AR	AR
3	Printing consumables (toner/ ink, replenisher, storage fluid, etc.)		AR	AR	AR
4	Printing substrate (paper, plastic, tarpaulin, synthetic paper, etc.)		AR	AR	AR

18. Competency Weightage

The following table shows the percentage of training priorities based on consensus made by the Standard Development Committee (SDC).

DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

CU CODE	COMPETENCY UNIT TITLE	COMPETENCY UNIT WEIGHTAGE	WORK ACTIVITIES	WORK ACTIVITIES WEIGHTAGE
C181-001-2:2023-C01	Carry Out Artwork Setting Finalization.	20%	1. Carry out Digital Artwork Setting Confirmation.	40%
			2. Carry out Digital Artwork Setting Adjustment.	40%
			3. Carry out Final Digital Artwork Compilation.	20%
C181-001-2:2023-C02	Perform Digital Printer Preparation.	40%	1. Carry Out Digital Printing Specification Checking.	10%
			2. Organise Digital Printing Substrates.	15%
			3. Carry Out Digital Printer Server Setting.	30%
			4. Carry Out Digital Printer Setup.	15%
			5. Carry Out Printing Sample Preparations.	30%
C181-001-2:2023-C03	Perform Digital Printing Process.	30%	1. Carry out Digital Printer Start Up.	15%
			2. Carry Out Product Printing.	15%
			3. Carry Out Digital Printing Quality Inspection.	30%
			4. Carry Out Product Finishing Process.	30%

			5. Carry Out Housekeeping Practice.	10%
C181-001-2:2023-C04	Perform Digital Printer Routine Maintenance.	10%	1. Prepare Digital Printer Routine Maintenance Requirements.	20%
			2. Carry Out Digital Printer Servicing.	30%
			3. Carry Out Digital Printer Calibration.	30%
			4. Update Digital Printer Routine Maintenance Record.	20%
TOTAL PERCENTAGE (CORE COMPETENCY)		= 100%		

APPENDICES

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

DIGITAL PRINTING TECHNICAL SERVICES

LEVEL 2

19. Appendices

19.1 Appendix A: Competency Profile Chart For Teaching & Learning (CPC_{PdP})

i. CU to CU_{PdP} Correlation

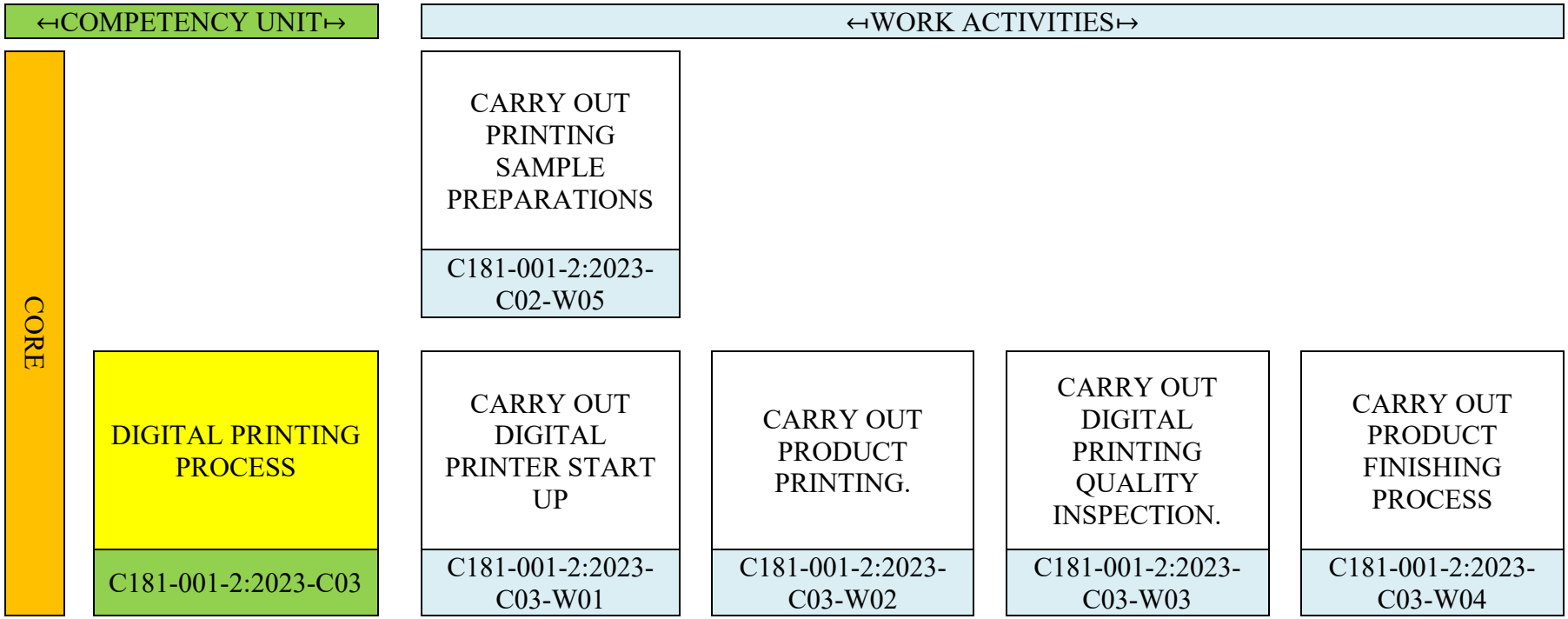
SECTION	(C) MANUFACTURING		
GROUP	(181) PRINTING AND SERVICE ACTIVITIES RELATED TO PRINTING		
AREA	DIGITAL PRINTING		
NOSS TITLE	DIGITAL PRINTING TECHNICAL SERVICES		
NOSS LEVEL	TWO (2)	NOSS CODE	C181-001-2:2023

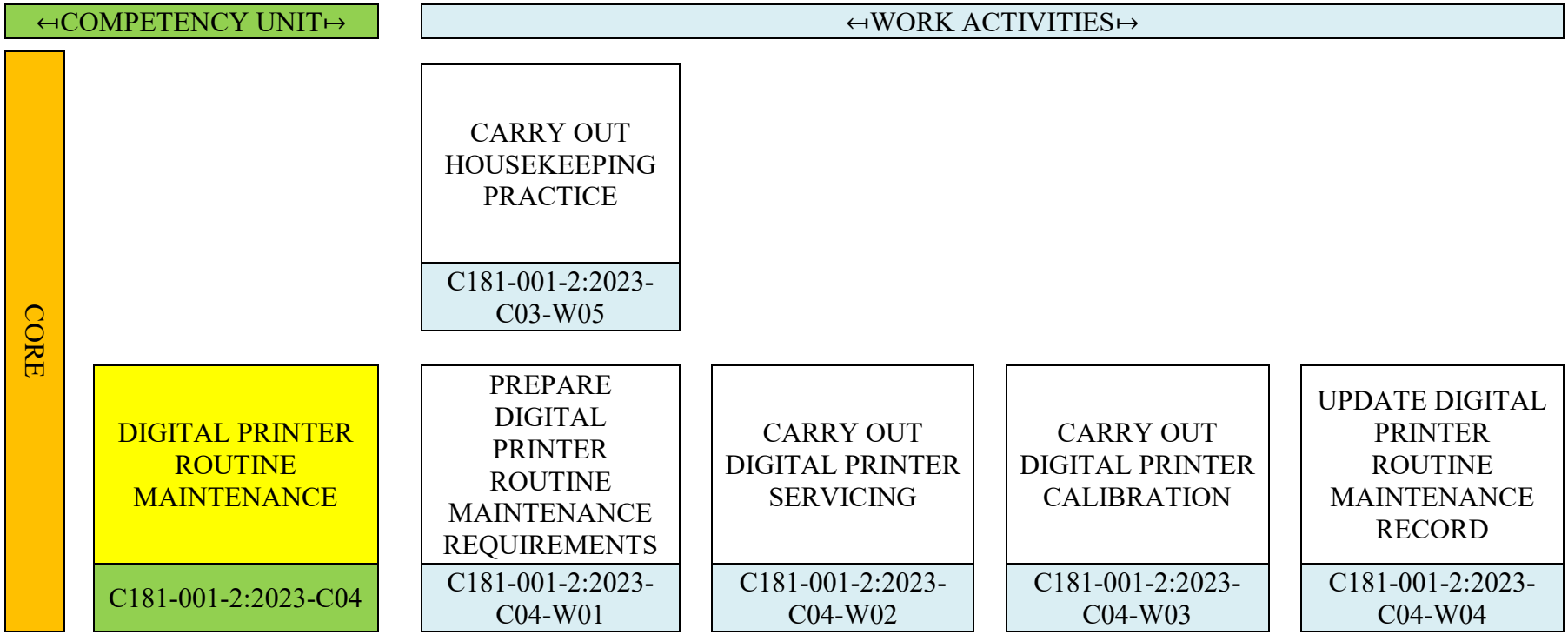
CU CODE	CU TITLE	CU_{PdP} TITLE For Teaching & Learning
C181-001-2:2023-C01	CARRY OUT ARTWORK SETTING FINALIZATION	ARTWORK SETTING ASSESSMENT
C181-001-2:2023-C02	PERFORM DIGITAL PRINTER PREPARATION	DIGITAL PRINTER SETUP
C181-001-2:2023-C03	PERFORM DIGITAL PRINTING PROCESS	DIGITAL PRINTING PROCESS
C181-001-2:2023-C04	PERFORM DIGITAL PRINTER ROUTINE MAINTENANCE	DIGITAL PRINTER ROUTINE MAINTENANCE

ii. Competency Profile Chart for Teaching & Learning (CPC_{PdP})

SECTION	(C) MANUFACTURING		
GROUP	(181) PRINTING AND SERVICE ACTIVITIES RELATED TO PRINTING		
AREA	DIGITAL PRINTING		
NOSS TITLE	DIGITAL PRINTING TECHNICAL SERVICES		
NOSS LEVEL	TWO (2)	NOSS CODE	C181-001-2:2023

	↤COMPETENCY UNIT↦	↤WORK ACTIVITIES↦			
CORE	ARTWORK SETTING ASSESSMENT	CARRY OUT DIGITAL ARTWORK SETTING CONFIRMATION	CARRY OUT DIGITAL ARTWORK SETTING ADJUSTMENT	CARRY OUT FINAL DIGITAL ARTWORK COMPILATION	
	C181-001-2:2023-C01	C181-001-2:2023-C01-W01	C181-001-2:2023-C01-W02	C181-001-2:2023-C01-W03	
	DIGITAL PRINTER SETUP	CARRY OUT DIGITAL PRINTING SPECIFICATION CHECKING	ORGANISE DIGITAL PRINTING SUBSTRATES	CARRY OUT DIGITAL PRINTER SERVER SETTING	CARRY OUT DIGITAL PRINTER SETUP
	C181-001-2:2023-C02	C181-001-2:2023-C02-W01	C181-001-2:2023-C02-W02	C181-001-2:2023-C02-W03	C181-001-2:2023-C02-W04


↤COMPETENCY UNIT↦
↤WORK ACTIVITIES↦
CORE
CARRY OUT PRINTING SAMPLE PREPARATIONS
C181-001-2:2023-C02-W05
DIGITAL PRINTING PROCESS
C181-001-2:2023-C03
CARRY OUT DIGITAL PRINTER START UP
C181-001-2:2023-C03-W01
CARRY OUT PRODUCT PRINTING.
C181-001-2:2023-C03-W02
CARRY OUT DIGITAL PRINTING QUALITY INSPECTION.
C181-001-2:2023-C03-W03
CARRY OUT PRODUCT FINISHING PROCESS
C181-001-2:2023-C03-W04



Notes:

CPC_{PdP} is meant to be used in Teaching and Learning context which is generated by conversion of the action verb in the CU Title to a noun in the CU_{PdP} Title from the given CPC sets.

19.2 Appendix B: Element Content Weightage

OSH - OCCUPATIONAL SAFETY AND HEALTH
SD - SUSTAINABLE DEVELOPMENT
M&A - MANAGEMENT AND ADMINISTRATION
IT - INDUSTRY TECHNOLOGICAL ADVANCES

DIGITAL PRINTING TECHNICAL SERVICES
LEVEL 2

CU CODE	CU TITLE	ELEMENT CONTENT WEIGHTAGE			
		OSH	SD	M&A	IT
C181-001-2:2023-C01	Carry Out Artwork Setting Finalization	10%	10%	25%	50%
C181-001-2:2023-C02	Perform Digital Printer Preparation	20%	20%	25%	20%
C181-001-2:2023-C03	Perform Digital Printing Process	40%	35%	25%	20%
C181-001-2:2023-C04	Perform Digital Printer Routine Maintenance	30%	35%	25%	10%

CU CODE	CU TITLE	ELEMENT CONTENT WEIGHTAGE			
		OSH	SD	M&A	IT
TOTAL ELEMENT CONTENT WEIGHTAGE		100%	100%	100%	100%
NOTES		C03 has the highest value of 40% because of the risks and difficulties involved in the machine position, which requires the personnel to move around the machine, whereas C01 has the lowest 10% value because of the personnel's position, which remains stationary.	C03 and C04 have the highest value of 35% because of the usage of substrate and consumable materials in the working environment, while C01 has the lowest 10% value because of the nature of the job which does not involve high usage power energy.	All CUs are in average 25 %, because all Cus are mainly for operation level.	C01 has the highest value of 50% because of the usage of IT in performing job activities, while C04 has the lowest 10% value because of the nature of the job which does not involve so much IT.

All the CUs of this NOSS contain the element of sustainable development with the same weightage due to the same sustainability process in all the CUs.