Technical Education and Skills Development Authority

Webliography

The Webliography is an electronic bibliographic listing of topics related to the qualification titles of a particular TVET priority sector, with pre-searched *URLs* (uniform resource locators) and descriptions (abstracts).
The pre-searched *URLs*providecontents in reference to the titleof promulgated Training Regulations (TR). By clicking the weblinks (underlined URLs in blue text), your internet browser will direct you to the website/webpage where you can find the topic related to the title you selected. The Webliography is a useful tool for trainers who are designing and developing competency-based curriculum and learning materials.

Metals and Engineering Sector

Scope:
A multidisciplinary field concerned with the generation and application of knowledge relating to thecomposition, structure, and processing of materials to their properties and uses. The field encompasses the complete knowledge spectrum for materials ranging from the basic end (materialsscience) to the applied end (materials engineering). It forms a bridge of knowledge from the basicsciences (and mathematics) to various engineering disciplines.

Source:http://encyclopedia2.thefreedictionary.com/Materials+Science+and+Engineering

List of qualifications:

- CAD/CAM OperationNC III
- CNC Lathe Machine Operation NC II and III
- CNC Milling Machine Operation NC II and III
- Flux-Cored Arc Welding NC I, II and III
- Gas Welding NC I and II
- Gas Metal Arc Welding NC I, II and III
- Gas Tungsten Arc Welding NC II and IV
- Machining NC I, II and III
- Mechanical Drafting NC I
- Plant Maintenance NC I
- Press Machine Operation NC I
- Submerged Arc Welding NC I and II

INTERNET RESOURCES

❖ **Metallurgy definition**
https://en.wikipedia.org/wiki/Metallurgy
This webpage describes metallurgy as a domain of materials science and engineering that studies the physical and chemical behavior of metallicelements, theintermetallic compounds, and their mixtures, which are called alloys.
[Retrieved July 2015]

❖ **Metal and Engineering Job Pathways**
http://www.wats.sa.edu.au/docs/vet_engineering/metals_and_engineering_job_pathways_chart.pdf
This webpage provides a chart for mapping metal and engineering jobs. It is useful in evaluating career paths in this industry sector.
[Retrieved July 2015]

❖ **Metals and engineering resources (METERCOR)**
http://www.tuugo.ph/Companies/metals-engineering-resources-(metercor)/022000942672
This webpageprovides links to job opportunities in metals and engineering in the Philippines. It includes job-related data and contact information on job vacancies.
[Retrieved August 2015]

❖ **Metals engineering specialists in heat treating**
http://www.metalsengineering.net/services/
This webpageprovides information about the services offered by the company in relation to heat treating metallic materials. It includes services offered in stress relieving, annealing, normalizing, hardening, carburizing, etc.
[Retrieved August 2015]

❖ **Securing the Future of Philippine Industries**
http://industry.gov.ph/industry/metalcasting/
This webpageprovides information about the Philippine metalcasting industry that aims to supply majority of the domestic requirements for cast products, contributing to the development of downstream industries such as the equipment manufacturing sector to increase its production and help the economy produce more jobs.
[Retrieved September 2018]

❖ **Metal and Engineering Jobs in Australia**
http://www.careerjet.com.au/metal-and-engineering-jobs.html
"This webpage provides a list of metals and engineering jobs in Australia including links to work details and related information.
[Retrieved August 2015]

INTERNET RESOURCES

CAD/CAM Operation NC III
Core Competencies

1. Create drawing using CAD software
2. Apply CAD/CAM program

❖ **CAD Definition**
http://whatis.techtarget.com/definition/CAD-computer-aided-design
This webpagedefines CAD as the software used by architects, engineers, drafters, artists, and others to create precision drawings or technical illustrations. CAD software can be used to create two-dimensional (2-D) drawings or three-dimensional (3-D) models.
[Retrieved August 2015]

❖ **CAM Definition**
https://en.wikipedia.org/wiki/Computer-aided_manufacturing
This webpage defines CAM as the use of software to control machine tools and related machinery in the manufacturing of workpieces. CAM may also refer to the use of a computer to assist in all operations of a manufacturing plant, including planning, management, transportation and storage.
[Retrieved August 2015]

❖ **CAD operator**
http://jobs.jobstreet.com/ph/jobs/5878884?fr=J&src=12
This webpage defines the job description and responsibilities of a CADD operator required by a consulting company in the Philippines.
[Retrieved August 2015]

❖ **CAD operator, career guide**
http://eskwelahan.com/careerguide/cg-cad.html
This webpage provides detailed information about the tasks, basic education and training requirements, skills and competencies, of a CAD operator among others in preparation for employment.
[Retrieved August 2015]

❖ **Camworks modules**
http://www.camworks.com/modules/
This webpage features a demo software with CNC programming capability.
[Retrieved August 2015]

❖ **CAD/CAE and BIM training centers in the Philippines**
https://dindomojica003.wordpress.com/2013/12/01/4900/
This webpage provides a list of CAD training courses in the Philippines including training duration, course description, and tuition fees.
[Retrieved August 2015]

❖ **CAD drawing software**
http://www.smartdraw.com/floor-plan/cad-drawing-software.htm
This webpage features SmartDraw software that can be downloaded and readily used upon installation to create architectural and mechanical drawings. It also includes templates, symbols library and drafting controls among others.
[Retrieved August 2015]

❖ **AutoCAD tutorials**
http://www.lynda.com/AutoCAD-training-tutorials/160-0.html
This webpage provides a series of expert-led training on AutoCAD that shows how to create 3D designs, share and collaborate layouts and more. The tutorials are not free but a free 10-day trial is available upon registration.
[Retrieved August 2015]

CNC Lathe Machine Operation NC II
Core Competencies

❖ **Computer numerical control (CNC)**
http://wings.buffalo.edu/eng/mae/courses/460-564/Course-Notes/CNC%20notes.pdf

1. Write basic CNC lathe machine program
2. Set-up CNC lathe machine, workpiece and cutting tools
3. Perform basic CNC lathe machine operations

CNC Lathe Machine Operation NC III
Core Competencies

1. Write advanced CNC lathe machine program
2. Set-up multiple-axis CNC lathe machine workpiece and cutting tools
3. Perform advanced CNC lathe machine operations

INTERNET RESOURCES

This webpage describes CNC as the technology that controls the operation of machine tool means of a prepared program containing coded alphanumeric data. CNC can control the motions of the workpiece or tool, the input parameters such as feed, depth of cut, speed and the functions such as turning spindle on/of, turning coolant on/off.
[Retrieved August 2015]

❖ **CNC lathe machine operator jobs, employment**
http://www.indeed.com/q-cnc-lathe-machine-operator-jobs.html
This webpage provides a list of job opportunities of a CNC machinist. This includes job description and links to more detailed information required by prospective employers
[Retrieved August 2015]

❖ **CNC lathe training**
http://www.thomasnet.com/articles/custom-manufacturing-fabricating/cnc-lathe-training
This webpage describes the training program in CNC Lathe It also includes descriptions of Beginner's and Advances Classes
[Retrieved August 2015]

❖ **CNC lathe Basic Programming Example ID/OD/Turning/Boring Operations**
http://www.helmancnc.com/cnc-lathe-basic-programming-example-id-od-turning-boring-operations/
This webpage describes a full CNC programming example with ID/OD (Turning/Boring operations) for CNC machinists who work on the CNC lathe machine.
[Retrieved September 2018]

❖ **CNC lathe Simple G Code Example – G code Programming for Beginners**
http://www.helmancnc.com/cnc-lathe-simple-g-code-example-g-code-programming-for-beginners/
This webpage describes an example of simple G code programming for CNC machines.
[Retrieved September 2018]

❖ **CNC Programming with G-Code: The Definitive Guide in 2018**
https://www.cnccookbook.com/cnc-programming-g-code/
This webpage provides information about G-Code Programming including explanation of principles and methods used in CNC Programming.
[Retrieved September 2018]

❖ **What CNC programming style best suits your operations?**
https://www.mazakusa.com/news-events/blog/what-cnc-programming-style-best-suits-your-operations/
This webpage provides information about CNC programming using the 3 modes: Manual Programming, Conventional Programming, and CAM System Programming.
[Retrieved September 2018]

❖ **Beginner's Guide to CNC Machine Setup**
https://www.cnccookbook.com/cnc-machine-setup-setting-procedure-lathe-milling/
This webpage provides information in setting up the CNC lathe machine for operation in 9 simple steps.
[Retrieved September 2018]

INTERNET RESOURCES

CNC Milling Machine Operation NC II
Core Competencies

1. Write basic CNC milling machine program
2. Set-up CNC milling machine workpiece and cutting tools
3. Perform basic CNC milling machine operations

CNC Milling Machine Operation NC III
Core Competencies

1. Write advanced CNC milling machine program
2. Set-up multiple-axis CNC milling machine workpiece and cutting tools
4. Perform advanced CNC milling machine operations

❖ **How to Setup a CNC Lathe Machine**
https://careertrend.com/how-5447873-set-up-cnc-lathe-machine.html
This webpage provides information in setting up the CNC lathe machine for operation,by following thorough, proper setup procedures, to reduce the risk of tool damage and wasted raw material.
[Retrieved September 2018]

❖ **What is CNC Machining? An Overview of the CNC Machining Process**
https://astromachineworks.com/what-is-cnc-machining/
This webpage provides information about the CNC machining process using a pre-programmed computer software to control the movement of factory tools and machinery.
[Retrieved September 2018]

❖ **CNC machining I (Southern California)**
http://www.indeed.com/q-cnc-lathe-machine-operator-jobs.html
This webpage provides a lineup of programs designed for experienced machinists and machine operators, who need or want to update their sills in CNC operations, and programming
[Retrieved August 2015]

❖ **What is a CNC machine and its operation?**
https://www.quora.com/What-is-a-CNC-machine-and-its-operation#
This webpage provides information about CNC milling and its operation.
[Retrieved September 2018]

❖ **More About CNC Milling**
https://www.thomasnet.com/about/cnc-milling-51276103.html
This webpage provides information about CNC milling which is a form of computer numerical control (CNC) machining process similar to both drilling and cutting machines.
[Retrieved September 2018]

❖ **How to Operate a CNC Milling Machine**
https://careertrend.com/how-6618939-operate-cnc-milling-machine.html
This webpage provides information and procedures in operating a CNC milling machine for every aspect of the operation.
[Retrieved September 2018]

❖ **CNC Milling Machine Programming Example for Beginners**
http://www.helmancnc.com/cnc-milling-machine-programming-example-for-beginners/
This webpage provides a simple CNC milling machine programming tutorial for beginner level CNC machinists.
[Retrieved September 2018]

❖ **Basic Programming of CNC Milling Machine**
https://www.slideshare.net/MaheshNamdev1/4-basic-cnc-programming-milling
This webpage shows an online slide presentation on basic programming for CNC milling machine. 95 slides comprise the presentation with transcript.
[Retrieved September 2018]

❖ **CNC Milling Programs**
https://www.slideshare.net/moniraghu/cnc-milling-programs
This webpage shows an online slide presentation on CNC milling codes and samples of CNC milling program s with drawings.
[Retrieved September 2018]

INTERNET RESOURCES

Flux Cored Arc Welding NC I
Core Competency
1. Weld carbon steel plates using FCAW

Flux Cored Arc Welding NC II
1. Weld carbon steel pipes using FCAW

Flux Cored Arc Welding NC II
1. Weld alloy steel plates using FCAW
2. Weld alloy steel pipes using FCAW

❖ **Flux-Cored Arc Welding**
https://en.wikipedia.org/wiki/Flux-cored_arc_welding
This webpage defines flux-cored arc welding as a semi-automatic or automatic arc welding process that requires a continuous supply feed of consumable tubular electrode containing a flux and a constant voltage or current welding power supply.
[Retrieved September 2018]

❖ **What is Flux-Cored Arc Welding?**
https://www.keenovens.com/articles/flux-cored-welding.html
This webpage describes flux-cored arc welding as a process very closely related to Metal Inert Gas Welding which uses the same equipment and power supply.
[Retrieved September 2018]

❖ **Effect of Gas-Shielded Flux-Cored Arc Welding Parameters on Weld Width and Tensile Properties of Weld Metal in a Low Carbon Steel**
https://scialert.net/fulltext/?doi=jas.2010.658.663
This webpage provides information on the effect of gas-shielded flux-cored arc welding on metals with low carbon content.
[Retrieved September 2018]

❖ **Flux-Cored Welding: The Basics for Mild Steel**
https://www.millerwelds.com/resources/article-library/flux-cored-welding-the-basics-for-mild-steel
This webpage provides information on the process of flux-cored arc welding covering topics on safety, material, equipment, among others, and pictures showing the processes.
[Retrieved September 2018]

❖ **Flux-Cored Wire Selection**
https://www.lincolnelectric.com/en-us/support/welding-how-to/pages/flux-cored-wire-selection-detail.aspx
This webpage provides information on types of wire used in semi-automatic and fully automatic flux-cored arc welding processes.
[Retrieved September 2018]

❖ **Tubular or Flux-Cored Electrodes**
http://weldguru.com/flux-cored-electrodes/
This webpage provides information on the composition of electrodes used in flux-cored arc welding and the theory behind it.
[Retrieved September 2018]

❖ **Flux-Cored Arc Welding Electrodes for Carbon and Low Alloy Steels**
https://www.esabna.com/euweb/awtc/lesson7_6.htm
This webpage provides information on the manufacture of flux-cored electrodes. Links to related topics are also available.
[Retrieved September 2018]

❖ **Welding Stainless Steel Right**
https://www.thefabricator.com/article/arcwelding/welding-stainless-steel-right
This webpage provides information or guide in welding stainless steel and choosing filler metal for the welding process. *When choosing a process and filler metal for welding stainless steel, fabricators need to consider the upfront cost and characteristics of the filler metal, required productivity, equipment complexity, and operator skill set*.
[Retrieved September 2018]

INTERNET RESOURCES

Gas Metal Arc Welding NC I, NC II and NCIII **Core Competencies** 1. Weld carbon steel plates using GMAW 2. Weld carbon steel pipes using GMAW 3. Weld alloysteel plates using GMAW 4. Weld alloy steel pipes using GMAW	❖ **Gas Metal Arc Welding** https://www.sciencedirect.com/topics/materials-science/gas-metal-arc-welding This webpage provides information and describes gas metal arc welding as a process in which the source of heat is an arc formed between consumable metal electrode and the work piece with an externally supplied gaseous shield of gas either inert such as argon and/or helium. [Retrieved September 2018] ❖ **Mechanical Characteristics of Gas Metal Arc Weldingof ASTM A 516 Grade 70 Steel** https://www.researchgate.net/publication/309610759_MECHANICAL_CHARACTERISTICS_OF_GAS_METAL_ARC_WELDING_OF_ASTM_A_516_GRADE_70_STEEL This webpage provides information and downloadable full text on the mechanical characteristics of GMAW of ASTM A 516 Grade 70 Steel. [Retrieved September 2018] ❖ **MIG Welding Basics** https://www.millerwelds.com/resources/article-library/mig-welding-the-basics-for-mild-steel This webpage provides basic information and guide on MIG welding for beginners. Video and pictures are available to enhance learning. [Retrieved September 2018] ❖ **MIG Welding Carbon Steel** http://gowelding.org/welding/mig-gmaw/carbon-steel/ This webpage provides information and guide in the preparation of and welding carbon steel work pieces using the gas metal arc welding process. [Retrieved September 2018] ❖ **Development of a Welding Procedure for MIL A 46100 Armor Steel Joints Using Gas Metal Arc Welding** http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0012-73532011000400008 This webpage provides information on the development of a welding procedure for high strength steel plates . [Retrieved September 2018] ❖ **How to Weld Steel Pipes** https://sciencing.com/weld-steel-pipes-8241048.html This webpage provides information on welding steel pipes along with the procedures and preparation to make a successful weld. [Retrieved September 2018]
Gas Tungsten Arc Welding NC II **Core Competencies** 1. Weld carbon steel plates using GTAW 2. Weld carbon steel pipes using GTAW	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. [Retrieved August 2015]
Gas Tungsten Arc Welding NC IIV **Core Competencies** 1. Weld alloy steel plates using GTAW 2. Weld alloy steel pipes using GTAW	❖

INTERNET RESOURCES

Gas Welding NC I and II	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. [Retrieved August 2015]
Machining NC I, II and III	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. Retrieved July 2015
Mechanical Drafting NC I	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. Retrieved July 2015
Plant Maintenance NC I	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. Retrieved July 2015
Press Machine Operation NC I	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. Retrieved July 2015
Submerged Arc Welding NC I	❖ **Description** fs-group.com/files/Galley_Steward.pdf This webpage presents a document describing the job of a galley steward. Retrieved July 2015