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MENT101 Pedagogy for Engineering Technology

ECTS Value: 5 ECTS
Self-Study Hours: 60

Contact Hours: 25
Assessment Hours: 40

Overall Objectives and Outcomes

This unit provides the opportunity for course participants to explore Engineering Technology and equip them with the necessary skills and competences to design and deliver effective learning opportunities particularly within the school vocational workshop. Throughout this module course participants will be exposed to different teaching and learning methodologies for Engineering Technology which will help them get into the right-thinking path as educators and create an environment which supports learning.

By the end of this module, the learner will be able to:

Competences:

a. Manage workshop control during practical vocational sessions and at the same time keep students highly motivated;
b. Engage in literature to evaluate pedagogies and technologies that can be used to improve the quality of learning and the general safety in workshops;
c. Integrate concepts from related technologies into the design of a product component or product;
d. Devise practical and applied lessons to be delivered in a workshop;
e. Create resources which will help students better understand the topic and facilitate learning;
f. Ensure lessons cater towards learners of different needs and abilities.
g. Evaluate Engineering technology Vocational Education and Training resource requirements.

Knowledge:

a. Explain competency-base vocational engineering education and training;
b. Demonstrate knowledge of inquiry-based teaching and learning methodologies as applied to Technology Engineering education and training;
c. Demonstrate knowledge of systems and methodologies to improve teaching quality;
d. Demonstrate knowledge of the Learning Outcome Approach, also known as the Instructional Objectives Approach;
e. Demonstrate knowledge of how the concepts of 'high constructability', 'operability', 'Maintainability and reliability' with 'cost control', are achieved with related technologies;

Skills:

a. Develop and deliver Engineering Technology lessons with opportunities for formative and summative learning assessments;

b. Design methods to conduct an analysis , of learners' needs in an Engineering Technology context;
c. Analyse the fabrication or manufacturing resources required and related methodology to produce a product considering workshops available and space;
d. Apply practices that integrate engineering technology disciplines such as technical design and fabrication techniques to achieve integrated, developmental appropriate learning experiences for all students;

Assessment Methods

This module will be assessed through: Assignment

Suggested Readings

Core Reading List:

1. Goodhew, P.J. (2010). Teaching Engineering: All you need to know about engineering education but were afraid to ask. UK: The Higher Education Academy. Available from: http://core.materials.ac.uk/repository/teachingengineering/teaching_engineering_goodhew.pdf 2.
2. Felder, R.M. and Brent, R. (1999). How to improve teaching quality. Quality Management Journal, 6(2), 9-21. 3.
3. Lucas, B., Spencer, E., & Claxton, G. (2012). How to Teach Vocational Education: A Theory of Vocational Pedagogy. London: City & Guilds Centre for Skills Development.

Supplementary Reading List

1. NSPE (2013). Professional Engineering Body of Knowledge: Prepared by the Licensure and Qualifications for Practice Committee of the National Society of Professional Engineers. Available at: https://www.nspe.org/sites/default/files/resources/nspe-body-of-knowledge.pdf
2. 2. Effective Adult Learning: A Toolkit for Teaching Adults. Available at: http://www.nwcphp.org/training/opportunities/toolkits-guides/effective-adult-learning-atoolkit-for-teaching-adults;
3. Lang, J.M. (2016). Small Teaching: Everyday Lessons from the Science of Learning. Jossey-Bass.
4. Oakley, B. (2014). A Mind for Numbers: How to Excel at Maths and Science. Tarcher Perigee.