Engineering drawing
Course Outcome Summary

Course Information
Project Type: Course Outline
Organization: Electricity & Water Training Institute
Developers: Electrical Networks Department team (EWT)
Development Date: 7/4/2007
Revised By: Eng. Ahmed Alothman and Eng. baker alsayed
Instructional Level: Diploma
Instructional Area: Electrical Engineering
Department: Electrical Networks
Potential Hours of Instruction: 60
Total Credits: 4

Description
This course will study the engineering drawing tools, and the application of simple engineering operations

Target Population
High school graduated students whom finished the introductory course which is required by the Electricity and Water Training Institute.

Textbooks
Network department. handout.

Learner Supplies
drawing tools.
Handout.

Prerequisites
Introductory course

Exit Learning Outcomes
Core Abilities
A. Learn effectively
1. learner takes responsibility for self as a learner
2. learner uses resources to meet learning needs
3. learner identifies, organizes, assimilates, and integrates information and ideas
4. learner produces evidence of learning
B. Think critically and creatively
1. learner identifies a problem to be solved, task to be performed, or decision to be made
2. learner applies the principles and strategies of purposeful, organized thinking
3. learner evaluates information
4. learner distinguishes facts, inferences, and judgements
5. learner makes decisions considering alternatives and consequences
6. learner draws logical conclusions from evidence
7. learner supports viewpoints/arguments with reason and evidence

C. Act responsibly
1. learner takes responsibility for his/her own learning and actions
2. learner completes assigned tasks according to prescribed deadlines and quality standards
3. learner adheres to established attendance criteria/standards
4. learner maintains a safe and healthy work environment for self/group

D. Work cooperatively
1. learner contributes to a work-based team to accomplish common goals
2. learner exchanges information, ideas, and opinions in a team/group setting
3. learner participates in shared problem-solving.
4. learner demonstrates respect in relating to people
5. learner resolves conflicts in a constructive manner
6. learner completes his/her share of tasks necessary to complete a project

E. Solve problems
1. learner identifies problems to be solved, tasks to be performed, or decisions to be made.
2. learner formulates alternative solutions, processes, or decisions and identifies potential consequences.
3. learner selects appropriate solutions, processes or decisions.
4. learner evaluates problems, monitors the feedback and revises plans indicated by the findings.

F. Communicate effectively
1. learner comprehends written materials
2. learner writes clearly, concisely, and accurately
3. learner speaks so others can understand
4. learner demonstrates active listening skills

G. Use technology
1. learner analyzes technology resources to meet needs.
2. learner selects and uses appropriate technology
3. learner uses technology to communicate
4. learner solves problems using technology
5. learner uses appropriate technology to manage information

Program Outcomes
A. Apply The Electrical Safety Rules
B. Use the Sub-Station Lay Out
C. Maintain Protective Relays and C.T., P.T. (O/C, E/F, Diff., etc.)
D. Carry Out the Preventive Maintenance For Circuit Breaker (Oil, SF6, Vacuum, Air)
E. Maintain the SwitchGear Panel (Bus-Bar, Isolator, Terminals, Cable End Box, Local Cubical)
F. Prepare And Maintain Batteries And Battery Chargers (220V, 110V, 50V)
G. Carry Out the Preventive Maintenance For Power Transformer
H. Maintain The Motor-Starter
I. Use Electrical Measuring Instruments
J. Use Electrical Maintenance Forms In English

**Competencies**

1. **Identify the engineering drawing tools**
   
   **You will demonstrate your competence:**
   
   o In drawing classroom
   o By a given drawing assignment
   o By evaluation of the weekly drawing exercises and reports

   **You performance will be successful when:**
   
   o Learner will follow the given drawing procedure in the given exercise
   o Learner will carry out a given drawing exercise properly
   o Learner will finish the assigned drawing exercise on time
   o Learner will be able to analyze drawing exercise results
   o Learner will submit the assigned drawing exercise on time
   o Drawn assignment meets the given requirement

   **Learning Objectives**
   
   a. Identify the different drawing papers
   b. Administer the drawing tools
   c. Identify relationship between measuring ruler and drawing scale

2. **Execute simple engineering drawing operation**

   **You will demonstrate your competence:**
   
   o In drawing classroom
   o By a given drawing assignment
   o By evaluation of the weekly drawing exercises and reports

   **Your performance will be successful when:**
   
   o Learner will follow the given drawing procedure in the given exercise
   o Learner will carry out a given drawing exercise properly
   o Learner will finish the assigned drawing exercise on time
   o Learner will be able to analyze drawing exercise results
   o Learner will submit the assigned drawing exercise on time
   o Drawn assignment meets the given requirement

   **Learning Objectives**
   
   a. Use drawing tools properly
   b. Bisect a line and an angle
   c. Draw perpendicular line at a given point of an other straight line
   d. Draw a straight line tangent on two circles
   e. Draw a straight line parallel to given vector

3. **Identify the different types of Line & scales**

   **You will demonstrate your competence:**
   
   o In drawing classroom
o By a given drawing assignment
o By evaluation of the weekly drawing exercises and reports

*Your performance will be successful when:*
o Learner will follow the given drawing procedure in the given exercise
o Learner will carry out a given drawing exercise properly
o Learner will finish the assigned drawing exercise on time
o Learner will be able to analyze drawing exercise results
o Learner will submit the assigned drawing exercise on time
o Drawn assignment meets the given requirement

**Learning Objectives**

a. Draw a coaxial, hidden and solid line
b. Draw sectional plane, hatching line plane and distance plane

4. **Study the projection planes**

*You will demonstrate your competence:*
o In drawing classroom
o By a given drawing assignment
o By evaluation of the weekly drawing exercises and reports

*Your performance will be successful when:*
o Learner will follow the given drawing procedure in the given exercise
o Learner will carry out a given drawing exercise properly
o Learner will finish the assigned drawing exercise on time
o Learner will be able to analyze drawing exercise results
o Learner will submit the assigned drawing exercise on time
o Drawn assignment meets the given requirement

**Learning Objectives**

a. Apply vertical dimension
b. Draw the top views

5. **Study the isometric projection**

*You will demonstrate your competence:*
o In drawing classroom
o By a given drawing assignment
o By evaluation of the weekly drawing exercises and reports

*Your performance will be successful when:*
o Learner will follow the given drawing procedure in the given exercise
o Learner will carry out a given drawing exercise properly
o Learner will finish the assigned drawing exercise on time
o Learner will be able to analyze drawing exercise results
o Learner will submit the assigned drawing exercise on time
o Drawn assignment meets the given requirement

**Learning Objectives**

a. Draw Isometric shapes and three dimension shapes
b. Study top view, front view and side view
c. Draw Isometric projection of vertical pyramid
d. Draw Isometric projection of a sphere
6. **Apply projection planes**  
You will demonstrate your competence:  
- In drawing classroom  
- By a given drawing assignment  
- By evaluation of the weekly drawing exercises and reports  
Your performance will be successful when:  
- Learner will follow the given drawing procedure in the given exercise  
- Learner will carry out a given drawing exercise properly  
- Learner will finish the assigned drawing exercise on time  
- Learner will be able to analyze drawing exercise results  
- Learner will submit the assigned drawing exercise on time  
- Drawn assignment meets the given requirement  

**Learning Objectives**  
- a. Apply vertical dimension  
- b. Draw the top views  

7. **Apply isometric planes**  
You will demonstrate your competence:  
- In drawing classroom  
- By a given drawing assignment  
- By evaluation of the weekly drawing exercises and reports  
Your performance will be successful when:  
- Learner will follow the given drawing procedure in the given exercise  
- Learner will carry out a given drawing exercise properly  
- Learner will finish the assigned drawing exercise on time  
- Learner will be able to analyze drawing exercise results  
- Learner will submit the assigned drawing exercise on time  
- Drawn assignment meets the given requirement  

**Learning Objectives**  
- a. Draw Isometric shapes and three dimension shapes  
- b. Study top view, front view and side view  
- c. Draw Isometric projection of vertical pyramid  
- d. Draw Isometric projection of a sphere  
- e. Draw Isometric projection of a cylinder  

8. **Execute different exercises**  
You will demonstrate your competence:  
- In drawing classroom  
- By a given drawing assignment  
- By evaluation of the weekly drawing exercises and reports  
Your performance will be successful when:  
- Learner will follow the given drawing procedure in the given exercise  
- Learner will carry out a given drawing exercise properly  
- Learner will finish the assigned drawing exercise on time  
- Learner will be able to analyze drawing exercise results
- Learner will submit the assigned drawing exercise on time
- Drawn assignment meets the given requirement

**Learning Objectives**

a. Practice drawing engineering shapes

b. Practice using different projection techniques