King Fahd University of Petroleum & Minerals
MECHANICAL ENGINEERING DEPARTMENT
ME 323: Manufacturing Processes Laboratory

Catalogue Description: (0-3-1)
The laboratory experiments and demonstrations are focused on lab learning of various manufacturing processes, related to metrology, material testing, machining including CNC and conventional machine tools, welding processes, die casting facilities, plastic processing, and sheet metal processing to demonstrate and give to students a hands on experience of different manufacturing processes.

Status in Curriculum (Required or Elective): Required (offered Fall & Spring)

Prerequisites: CE 101 or ME 210, and ME 216 and ME 217

Co-requisites: ME 322

Prerequisites by Topics:
- Engineering Graphics
- Material Science
- Material Science Lab

Textbook: **Lab manual, Mechanical Engineering Department, King Fahd University of Petroleum & Minerals Dhahran Saudi Arabia**

References:
1) **Kalpakjian, S., Manufacturing Processes for Engineering Materials, 5th edition, Addison-Wesley, 2008.**
2) **K. P. Groover, Fundamentals of Modern Manufacturing: Materials, Processing, and Systems, John Wiley, New York.**

Coordinator: **Mr. Faheemuddin Patel, Lecturer,** Mechanical Engineering

Goals: **(general objectives)**
1. To teach students to analyze and learn material processing and different manufacturing methods & machines. 2. To train students to conceptualize and analyze manufactured parts and manufacturing processes. 3. To expose the students to hands on experience of different manufacturing processes. 4. To teach students to write experimental laboratory reports

Course Outline (Lecture Topics):

1. Workshop orientation and safety procedures
2. Dimensional metrology
3. Machining project (drilling, turning, milling, etc.)
4. CNC demonstration
5. Plastics processing
6. Casting 1: Sand Casting with Permanent Pattern
7. Casting 2: Sand Casting with Expendable Pattern
8. Gas welding demonstration , Hands on experience
9. Arc welding demonstration and Hands on experience
10. TIG & MIG welding demonstrations and Weld quality test
11. Compression test
12. Sheet metal formability
13. Industrial trip

Design Activities/Projects:
None

Computer Usage:

All the assignments are done using computer e.g. writing, calculations of some experimental parameters and making tables and excel graphs.

Assessment Tools:

1. Experimental reports
2. Laboratory Projects
3. Exams

Course Learning Outcomes:

I. Demonstrate the ability to distinguish and describe the processes involved in component manufacture.
II. Demonstrate the skill to identify the steps pertaining to sheet metal formation processes.
III. Have the ability to identify issues pertaining to metal cutting processes.
IV. Explain the joining processes which utilize welding.
V. Describe the principles involved in measurements and inspection
VI. Develop a process plan for manufacturing a part.
VII. Work in a team to manufacture a part and carry out assembly.
VIII. Write technical reports highlighting issues related to manufacturing processes.
IX. Understand the impact of manufacturing on society and environment.

Course Learning Outcomes mapped to Student Outcomes:

Student Outcomes	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*
Course-to-Student outcome mapping	I, II, III, IV	I, II, III, IV, V		I, II, VII	I, II, III, IV, V, VI, VII		VIII	IX			VII
Emphasis*	**S**	**S**		**L**	**M**		**M**	**M**			**M**

* **L**: Little/None **M**: Moderate **S**: Strong

Status of Continuous Improvement review of this Course:

Date reviewed: 25-01-2014 **Reviewed by:** Faheemuddin Patel
Date prepared: 01-09-2013 **Prepared by:** Dr. Muzafferuddin Mahmood