***Course Specifications of:***

***Machining processes* (*MED 506*)**

**Program(s) on which the course is given:** Diploma in Computer Numerical Control Machines

**Compulsory or Elective element of program**: Elective

**Department offering the program:** Mechanical Engineering

**Academic year / Level:** year/ 2014/2015

**Date of specification approval:** 2012

1. **Basic Information**

**Title:** Machining processes **Code: MED 506**

**Credit Hours:3 Lecture: 3**

**Tutorial: Practical: Total:3**

**B- Professional Information**

1. **Overall aims of course:**

This course introduces students to:

* Promote awareness to the methods of automatic and robot control.
* Recognize the phenomena of measurement instruments and signal converters to control of industrial operations methods.
* Enhance the methods of physical and hydraulic control.

1. **Intended learning outcomes of course (ILOs)**

By completion of the course, the student should be able to:

**2.1 Knowledge and understanding**

2.1.3. Describe principles and fundamentals of quality in professional practice in the area of industrial operations control.

2.1.4 Explain the effect of professional practice on the environment and work towards its conservation and maintenance.

**2.2 Intellectual skills**

2.2.1 Discern and analyze the problems in the area of computer numerical control machines and categorize them according to their priority.

2.2.3 Critically and analytically read research papers and topics related tonumerical control machines.

2.2.4 Assess the risks and hazards in professional practices.

**2.3 Professional and practical skills**

2.3.1 Apply professional skills in the area of industrial operations control.(2.3.1)

**2.4 General and transferable skills**

2.4.2Use information technology in order to serve the development of professional practice.

2.4.4 Use different sources for obtaining information and knowledge.

2.4.6Lead a team in familiar professional contexts.

1. **Contents**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No of weeks** | **Topic** | **No. of hours** | **Teaching / learning methods and strategies** | **Assessment method** |
| 1 | Tool geometry- interrelations among the tool angles | 3 | Lecture,Class activity | - |
| 2 | Mechanism of chip formation- Orthogonal and oblique cutting | 3 | Lecture./Assign, case study | Assignment 1 |
| 3 | Machining Forces- Analytical and experimental estimation of cutting forces | 3 | Lecture, Class activity | Assignment 1 |
| 4 | Dynamometers for measuring cutting forces | 3 | Lecture,Class activity | Assignment 2 |
| 5 | Design of Dynamometers | 3 | Lecture/Assign. | Assignment 2, Quiz |
| 6 | Conventional cutting tools- Advanced Tool materials | 3 | Lecture,Class activity | Assignment 3 |
| 7 | Kinematics system of center lathe | 3 | Lecture,Class activity | Assignment 3, Quiz |
| 8 | **Midterm exam** | | | |
| 9 | General purpose machine tool drills- Kinematics of the drilling operation | 3 | Lecture/Assign. | Assignment 4 |
| 10 | Forces developed on the drilling operation | 3 | Lecture, Class activity | Assignment 4, , Quiz |
| 11 | Broaching – Principle systems and application- estimation of the cutting forces | 3 | Lecture/Assign. | Assignment 5 |
| 12 | Grind principles and application | 3 | Lecture, Class activity | Assignment 5 |
| 13 | Super finishing process- production of saw threads- gear manufacturing | 3 | Lecture, Class activity | Quiz |
| 14 | Jigs and fixtures for machine shops | 3 | Lecture, Case Study | Oral Exam |
| 15 | **Final exam** | | | |

1. **Course Matrix**

|  |  |  |
| --- | --- | --- |
| **ILO’s code number** | **Teaching/learning methods and strategies** | **Assessment methods and strategies** |
| 2.1.3  2.1.4 | Formal lectures | Individual coursework assignments, quizzes, oral discussions and reports. Midterm and /or final written examination is given. |
| 2.2.1  2.2.3  2.2.4 | Analysis and problem‐solving skills are developed through tutorial/problem sheets and small group exercises.  Research skills are developed through a small subject oriented research project. | Analysis and problem‐solving skills are assessed through oral and written examinations.  Design and research skills are assessed through project write-ups, coursework and project reports. |
| 2.3.1 | Experiments demonstrations, practical work, laboratory visits. | Practical skills are assessed through laboratory experimental write-ups, coursework exercises and reports, project reports and presentations. |
| 2.4.2  2.4.4  2.4.6 | Those skills are not explicitly taught; however, along the course of study the student will acquire those skills to be able to perform his obligations. Attendance of seminars, workshops or conferences will help the student in developing those skills. Presentation by students (either group or individual) will train students for those skills. | Project presentation |

1. **Teaching and Learning Methods**

* Lectures

Practical training / laboratory

Seminar / workshop

* Class activity
* Case study
* Assignments / homework

Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Student Assessment Methods**

* Assignments to assess knowledge and intellectual skills.
* Quiz to assess knowledge, intellectual and professional skills.
* Mid-term exam to assess knowledge, intellectual, professional and general skills.
* Oral exam to assess knowledge and intellectual skills.
* Final exam to assess knowledge, intellectual, professional and general skills.
* Other: Practical exam to assess knowledge, intellectual, professional and general skills.

1. **Assessment schedule**

Assessment 1 Assignments on weeks 2, 3, 4, 5 , 6, 7 ,9, 10, 11, and 12

Assessment 2 Quizzes on weeks 5, 7, 10, and 13

Assessment 3 Mid-term exam on weeks 8

Assessment 3 Oral exam on week 14

Assessment 4 Final exam on week 15

1. **Weighting of Assessments**

Mid-Term Examination 20%

Final-TermExamination 60%

Oral Examination 05%

Practical Examination 05%

Semester Work 10%

Other 00%

Total 100%

1. **List of References**

***9.1 Course Notes***

* Course notes prepared by instructor
* PowerPoint slides.

***9.2 Essential Books (Text Books)***

# Modern Machining Processes By P. C. Pandey, H. S. Shan.

# Fundamentals of Machining Processes: Conventional and Nonconventional ... By Hassan Abdel-Gawad El-Hofy

# Application of Metal Cutting Theory By Fryderyk E. Gorczyca

# Advanced Machining Processes of Metallic Materials: Theory, Modelling and ...By Wit Grzesik

* 1. ***Periodicals Websites, etc***

[***www.machiningprocesses.com***](http://www.machiningprocesses.com)

1. **Facilities Required for Teaching and learning**

Lecture room equipped with Presentation board, computer and data show

**Course coordinator:** Prof. Dr. Hossam Zakria

**Course instructor: 15.10.2015**

**Head of department:** Osama Ezzat Abdellatif