



Course Specification

Computer Aided Design &Mfg. CAD/CAM

Course Specifications

Program(s) in which the course is given:	Industrial Engineering
Major or minor element of programs:	N/A
Department offering the program:	Industrial Engineering
Department offering the course:	Mechanical Engineering Department
Academic year / Level:	2008/2009 / Level 3
Date of specification approval:	15/3/2009

A- Basic Information

Title: Computer aided design and Manufacturing (CAD/CAM)	Code: IND 305
Credit Hours:	
Lecture: 2	
Exercises: 2	
Total: 4	

B- Professional Information

1- Overall aims of the course

- 1- To provide the students the basic knowledge about the application of computers in design and manufacturing processes.
- 2- To allow the students to appreciate the application of CAD/CAM in real world.
- 3- To train the students on using CAD and CAM software.

2- Intended learning outcomes of the course (ILOs)

a. Knowledge and understanding

- 1- The advantages of CAD and CAM.
- 2- The basic structure of a computing system hardware as used in CAD/CAM systems.
- 3- The basics of computer graphics used in CAD.
- 4- The basics of geometric modeling.
- 5- Computer modeling using SolidWorks.
- 6- The principles of finite element analysis (FEA).
- 7- The principles of computer numerical control (CNC).
- 8- CNC part programming.
- 9- Computer aided part programming using FeatureCAM.

b. Intellectual skills

- Analysis Creative thinking Problem solving

c. Professional and practical skills

- Managing Engineering design
 Computer program Ability to diagnose
 Ability to identify the problem
 Ability to estimate cost Other

d. General and transferable skills

- Computing Communication
 Management Working in group
 Use of technological tools

3- Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
1- Introduction to CAD/CAM	4	2	2
2- CAD hardware	4	2	2
3- Computer Graphics	8	4	4
4- Geometric modeling.	8	4	4
5- Finite element analysis (FEA).	4	2	2
6- Computer Numerical Control (CNC).	4	2	2
7- CNC part programming.	8	4	4
8- Computer aided part programming.	8	4	4
9- Case Studies	12	6	6
Total	60	30	30

4- Teaching and learning methods

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|--|--|
| <input type="checkbox"/> Information collection | <input checked="" type="checkbox"/> Discussions |
| <input type="checkbox"/> Research assignment | <input type="checkbox"/> Field visit |
| <input checked="" type="checkbox"/> Lecture | <input checked="" type="checkbox"/> Practical training / lab |
| <input checked="" type="checkbox"/> Class activities | <input checked="" type="checkbox"/> Case study |

5- Student assessment methods

Class attendance and participation
 Homework assignments
 First midterm exam
 Final exam

Assessment schedule

Homework assignments weeks 3, 5, 7, 9, 11
 First midterm exam week 8
 Second midterm exam week 12

Weighting of assessments

Final 40 %
 8th week Exam 30 %
 12th week Exam 20 %
 Class attendance and participation 5 %
 Homework assignments 5 %

6- List of references

6.1 Course notes

6.2 Essential books

- CAD/CAM principles and applications, P. N. Rao, McGraw-Hill Company, 2nd Edition, 2004.
- Feature CAM user manual.
- SolidWorks user manual.

6.3 Recommended books

- Principles of CAD/CAM/CAE, Kunwoo Lee, Prentice Hall; US ed edition, 1999.
- Machine learning of robot assembly plans, Kluwer Academic Publishers Group.
- Solidworks 2007 bible, Matt Lobardm, Wiley.

7- Facilities required for teaching and learning

Computer Lab & Data Show

- **Course Coordinator:** Dr. Tamer Samir
- **Program Coordinator:** Prof. Dr. Attia Gomaa
- **General Supervisor & Vice Dean:** Prof. Dr. Abdalh Saad

Date: 01 / 06 / 2010