

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		<p>المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة</p>
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CAM Applications

College: Engineering

Department: Mechanical

First: Course Definition

1- Course Code: ME 636

2- Units: 3 credit hrs

3- Semester: All

4- Prerequisite: None

5- Co-requisite: None

6- Location (if not on main Campus):

Second: Course Objectives

The Course makes students able to:

- 1- Develop an understanding of the advanced aspects of enabling computer aided technologies used in design, manufacturing and rapid product development.
- 2- Develop a degree of competency in the development and application of modern CAD/CAM system through hands on experience in the solution of practical problems
- 3- Apply knowledge on advances in modern techniques of rapid prototyping and rapid tooling

Third: Course Specifications

1- Topics to be covered		
Subject	No of Weeks	Units
Introduction to Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM).	1	3
Methodologies and Components of CAD and CAM Systems	2	6
Product life cycle through Computer Integrated	1	3

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Manufacturing systems		
Introduction to Computer Numerical Control Machine Tools	2	6
Programming of CNC machine tools	3	9
Planning of resources for manufacturing through Information Systems	2	6
Computer Aided Process Planning	2	6
Computer Aided Quality Control	1	3
Computer Integrated Manufacturing systems (CIM)	1	3

2- Course components (Total hrs in the Semester):

Lecture	Exercise or lab	Other
45	--	--

3- Intended Learning Outcomes of the Course (ILO's)

a. Knowledge

i) Description of the knowledge to be acquired:

After studying this course, the student will be able to:

- Identify the Principles of CAD/CAM systems.
- Describe the Components of CAD/CAM Systems.
- Present the Principles of CNC Machine Tools.
- Define the Principles of CIM systems.
- Describe various term related to the Total Quality Management

ii) Teaching strategies to be used to develop that knowledge

- Class lectures.
- Students' presentations.
- Group discussion.

iii) Methods of assessment of knowledge acquired

- Exams.
- Quizzes.
- Homework assignments.

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b- Cognitive (Intellectual) Skills

i) Cognitive skills to be developed

After studying this course, the student will be able to:

- Explain the Product life cycle through Computer Integrated Manufacturing systems.
- Differentiate between G and M codes functions in CNC machine tools.
- Construct CNC Programming for specific parts.
- Classify the different methods of Computer Process Planning.
- Discuss the important terms related to Computer aided quality control.

ii) Teaching strategies to be used to develop these cognitive skills

- Class lectures.
- Simulation software Application.
- Practical Training.

iii) Methods of assessment of students' cognitive skills

- Students' seminars and presentations.
- Class Discussions.
- Case study Reports.

c. Interpersonal Skills and Responsibility

i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Problem Solving for specific CNC Part Programming.
- Communication skills.
- Analysis Skills.

ii) Teaching strategies to be used to develop these skills

- Class lectures.
- Case study analysis.

iii) Methods of assessment of students' interpersonal skills and capacity to carry responsibility

- Specific Assignments.
- Written reports.
- Students' seminars and presentations.

d. Communication, Information Technology and Numerical Skills

i) Description of the skills to be developed in this domain

- Literature research.

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- Problems modeling.
 - Utilization of computer applications in analysis and design.
- ii) Teaching strategies to be used to develop these skills**
- Class lectures.
 - Case studies analysis.
 - Computer lab sessions.
- iii) Methods of assessment of students numerical and communication skills**
- Written reports.
 - Students' seminars and presentations.

e. Psychomotor (if applicable) & Other Non-cognitive Skills

- i) Description of the psychomotor or other skills to be developed and the level of performance required**
- NA
- ii) Teaching strategies to be used to develop these skills-**
- NA
- iii) Methods of assessment of student's psychomotor skills**
- NA

4- Student Assessment Schedule

Serial	Assessment tool (test, group project, examination etc.)	Week due	Weight
1	Assignments	3 rd	10 %
2	Mid Term Exam	7 th	20 %
3	Class/Lab Activities	10 th	15 %
4	Case Study	13 th	15 %
5	Final Exam	16 th	40 %

5- Student Support

- Providing electronic library of textbooks and scientific periodicals.
- Providing the necessary computer applications for the course.

6- Learning Resources

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i) Essential Books (References)

- 1- Mikell P Groover, CAD/CAM Computer Aided Design Manufacturing, McGraw Hill, 1984.
- 2- G S Sawhney, Fundamentals of Computer Aided Manufacturing Textbook, IK International Pvt. Ltd. 2007,
- 3- Tien-Chien Chang Richard A. Wusk Hsu-Pin Wang, Computer Aided Manufacturing 2nd Ed., Prentice Hall, 2005.

ii) Course Notes

- NA

iii) Recommended Books

- P. Radhakrishnan, S. Subramanyan, V. Raju, CAD/CAM/CIM, third edition, 2008, New Age International Ltd., Publishers.
- Kunwoo Lee, Principles of CAD/CAM/CAE Systems, 1999, Addison Wesley Longman, Inc.

iv) Electronic Books & Web Sites:

- Scientific journals and forums.
- Instructor's instruction.

v) Periodicals

- International journal of CAD/CAM.
- Journal of Computer-Aided Design and Applications.

7- Course Evaluation and Improvement Processes

i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Students' questioners.
- Students' evaluation of course and instructor.

ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Public faculty seminars.
- Assessment by external evaluators of students achievements.

iii) Processes for Improvement of Teaching

- Assessment of students' work by external examiners.
- Analysis of students' evaluation of course and instructor.
- Seminars by industry professionals.

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iv) Processes for verifying standards of student achievement

- Check marking by an independent faculty member of a sample of student work.
- Periodic exchange and remarking of a sample of assignments/exams with a external evaluator.

v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- A continuous improvement process through adopting a closed loop assessment/improvement. The process depends on assessment by all stake holders for the M.Sc. program educational outcomes followed by instructor/program committee evaluation ending with proposing the necessary improvements.