University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form no. (12): **Course Specification**

1- Course Data

Course Code: **ME 455**	Course Title: **Computer Aided Design**		Academic Year/Level: **4th** year / **7th** semester
Specialization: **Mechanical**	No. of Instructional Units	Lecture	Practical
	3 credits	**2 hrs.**	**4 hrs.**

2- Course Aim

- The aim of this course is to enable the student to know how to design, analyze and present various problems encountered in the field of mechanical engineering with enough accuracy and speed by the aid of the computer

3- Intended Learning Outcomes

a- Knowledge and Understanding	**Through knowledge and understanding, students will be able to:** a.1) Concepts and theories of mathematics and sciences, appropriate to the discipline a.4) Principles of design including elements design, process and/or a system related to specific disciplines. a.5) Methodologies of solving engineering problems, data collection and interpretation
b- Intellectual Skills	**Through intellectual skills, students will be able to:** b.7) Solve engineering problems, often on the basis of limited and possibly contradictory information b.8) Select and appraise appropriate ICT tools to a variety of engineering problems
c- Professional Skills	**Through professional and practical skills, students will be able to:** c.2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services c.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results c.7) Apply numerical modeling methods to engineering problems c.p.4) Describe the basic Thermal and fluid processes mathematically and use the computer software for their simulation and analysis
d- General Skills	**Through general and transferable skills, students will be able to:** d.4) Demonstrate efficient IT capabilities.

4- Course Content

Week No.1	Introduction to computer aided design.
Week No.2	Introduction to the software "Solid Edge"
Week No.3	Basics of solid 2D and 3D parametric modeling using Solid Edge

Week No.4 Solid Edge profile environment

Week No.5 Primary and treatment features with Solid Edge

Week No.6 Introduction to finite element analysis

Week No.7 The finite element software "FEMAP" / 7th week evaluation

Week No.8 “FEMAP” model and mesh generation

Week No.9 Application to different machine element problems

Week No.10 MATLAB analysis and graphics

Week No.11 MATLAB analysis and graphics

Week No.12 Simulation of dynamic systems / 12th week evaluation

Week No.13 Application to different Mechanical, Hydraulic and Thermal systems (MATLAB 'Simulink').

Week No.14 Introduction to Optimization

Week No.15 System and element optimum design problems

Week No.16 Final Examination

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

Engineering Requirements and Design Considerations in college Buildings and its Leading Passages

- The design of college buildings and pedestrian passages leading to it are sloppy to allow the transportation of the handicapped;
- Doors are wide enough to let wheel chairs pass through easily and conveniently.
- Lifts are provided for movement between floors.
- Doors are made from light weight materials to make it easy for the handicapped suffering from weakness in limb muscles or those handicapped using prosthetic limbs to deal with them with the least muscular effort.
- Class floors are made from non-slippery materials to prevent falls on the part of the handicapped.
- Sudden changes in the floor level are prevented.

Design Considerations of the Classes

- Class boards are placed at 60 cm high to allow wheeled chair users or those suffering from limited arm mobility use them.
- Enough spaces are left between seats and benches to prevent hindering the movement of wheeled chairs between them.
- Handicapped students sit among normal people in class to be able to interact with them. Nevertheless, in

urgent cases according to the nature of the disability, the handicapped students sit in fixed suitable places whether at the front or the back of the class.

- Handicapped students sit close to the main exits of the class to be able to evacuate in case of emergencies.

Academic Support:

- The general academic advisor appoints an academic supervisor for handicapped students.
- Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, ------) to assess The Intellectual and general Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7th Week Assessment 12th Week Assessment Continuous Assessments 16th Week Final Written Exam
c- Weighing of Assessment	7th Week Evaluation 12th Week Evaluation Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• CAD lecture notes
c- Recommended Books	• Sham Tickoo. "Solid edge V20 for designers", 2008, Cadcim Technologies. Chandrakant S. Desai & Tribikram Kundu, "Introductory finite element method", 2001, CRC Pub., 1st edition. I. Zeid ,"CAD/ CAM Theory and practice ", McGrow Hill, 1994, 4th edition
d- Periodicals, Web Sites, etc.	N/A

Course Instructor: Prof. El-Sayed Saber **Head of Department: Prof. El-Sayed Saber**

Program Manager: Prof. El-Sayed Saber

Dean of College of Engineering and Technology of AASTMT
Name: **Prof. Moustafa Hussein Aly**
Signature:

Executive Manager of Quality Assurance Center of AASTMT
Name: **Prof. Aziz Ezzat**
Signature: