DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
MECHANICAL ENGINEERING PROGRAM, BSC.

Course Syllabus

1. **Course number and name**
   IE 556 CAD CAM Lab.

2. **Credits and contact hours**
   (3+0) 3 credit hours, 3 contact hours

3. **Course type**
   Blended Learning Course (2+1)

4. **Instructor's or course coordinator's name**
   Dr. Mohammad Nasir

5. **Textbook information**
   Manual of the Lab.

6. **Specific course information**
   a. **Catalog description**
      The lab contains different topics related to Computer aided design and manufacturing: CNC Milling, CNC Turing, sheet-metal, 3d printer, Casting, and Mold design and FEM project.

   b. **Prerequisites or co-requisites**

Co-requisite: IE 551 CAD CAM.

   c. **The course is:**
      Required in Industrial Engineering program.

7. **Specific goals for the course**
   a. **Course outcomes:**
      After completion of the course, students are expected to be able to:
   1. understanding CNC mill and turning programing code and using CAD CAM software or generating the program.
   2. Practice sheet metal work using CAD CAM software.
   3. Know the CAD CAM applications in 3 printer, casting pattern design and plastic mold Design.
   4. Practice CAD CAM usage in finite element analysis applications.

   b. **The following student outcomes are addressed by the course:**

SO-(2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

SO-(4) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environmental, and societal context.

SO-(pc) The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

8. Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
Course Outcomes			
CO-(1): Understanding CNC mill and turning programing code and using CAD CAM software or generating the program.	-	Lab experiment	Lab report
CO-(2): Practice sheet metal work using CAD CAM software.	-	Lab experiment	Assignment
CO-(3): Know the CAD CAM applications in 3 printer, casting pattern design and plastic mold Design.	-	Lab experiment	Project
CO-(4): Practice CAD CAM usage in finite element analysis applications.	-	Lab experiment	Final exam
Student Outcomes			
SO-(2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	2	Lectures (Example and Problems)	Midterm Exam
SO-(4) An ability to function effectively on a team whose members together provide leadership, create	1, 3	Term Project	Term Project-Part 2

a collaborative and inclusive environmental, and societal context.			
SO-(pc) The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.	1	Term Project	Term Project-Part 1

9. Weekly Teaching Plan

Week No.	Lab	Topic	Method of Delivery
1		CNC main components	Laboratory experiment
2		CNC mill G code basics	Laboratory experiment
3		CNC mill with CAD CAM software	Laboratory experiment
4		CNC turning with CAD CAM sofware	Laboratory experiment
5		Sheet metal design and manufacturing using CAD CAM	Laboratory experiment
6		3d printing FDM and CAD CAM software	Laboratory experiment

7		3d printing selective solidification with CAD CAM	Laboratory experiment
8		Using CAD CAM software for Casting pattern design and manufacturing.	Laboratory experiment
9		Plastic mold design and manufacturing using CAD CAM	Laboratory experiment
10		Plastic injection machine.	Laboratory experiment
11		Finite element analysis	Laboratory experiment
12		Lab project	Laboratory experiment
13		Lab project discussion and presentations	Laboratory experiment

10. Grade Distribution:

Assessment	Grade	Week No.
- Midterm Exam	30%	7th Week
-Assignments (Reports /Quizzes/ Home works ….)	30%	1-16th Week
- Final Examination	40%	16th Week

Note: Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.