DEPARTMENT OF INDUSTRIAL ENGINEERING
COURSE SYLLABUS

COURSE TITLE	*ENGLISH CODE/NO*	*ARABIC CODE/NO.*	*CREDITS*			
			Th.	*Pr.*	*Tr.*	*Total*
Computer Aided Manufacturing Systems	**IE 423**	هـ ص ٤٢٣	3	1	-	3
Pre-requisites:	IE 322					
Course Role in Curriculum	*Required or Elective:*		Elective			
Catalogue Description: Foundation of CAD/CAM. Fundamentals of CAM. Computer graphics software and data. Computer aided manufacturing: numerical control, NC part programming, NC, DNC and CNC systems. Industrial robots and applications. Computer Integrated manufacturing systems (CIMS).						

***Textbooks*:**
INTRODUCTION TO COMPUTER NUMERICAL CONTROL,Valentino J., and Goldenberg J., 3rd Ed, Prentice Hall, 2003

***References*:**
COMPUTER INTEGRATED MANUFACTURING, iWeatherall A., Butterworth Heinmann, 1985, Seamens W.S., Computer Numerical Control – Concepts and Programming, Delmar, 1983

***Supplemental Materials*:**

***Course Learning Outcomes*:**
By the completion of the course the student should be able to:

1. Develop the knowledge of CNC Machines.
2. Understand the basic principles and techniques of CAM.
3. Comprehend the different types of CNC machines especially milling and lathe machines.
4. Understand the different machining operations and tooling used for these operations.
5. Explore the advanced features of the modern CNC machining centers.
6. Understand and write NC part programs.
7. Understand the preparatory functions.
8. Understand the auxiliary functions.
9. Analyze & solve a real life problem for Term project with a team.
10. Understand the basic elements of APT programming language.
11. Comprehend the advantages of using the latest CAD/CAM technology

	Topics to be Covered:	***Duration in Weeks***
1	Introduction to CNC machines: advantages of CNC machines, different CNC machines, different machining operations, tooling for milling and lathe operations, cutting fluids for CNC operations, automatic tool changing systems, pallet loading systems.	2
2	Programming hole operations: programming language format, preparatory functions, dimensional functions, miscellaneous functions, fixed cycles, hole operation commands.	3
3	Programming linear profiles: linear interpolation commands, writing linear profiling programs, determining cutter offsets for inclined line profiles.	3
4	Programming circular profiles: specifying the plane, circular interpolation commands, profiling at constant feed rate.	2
5	CNC lathe programming: lathe axes of motion, basic lathe operations, lathe setup commands, preparatory functions, miscellaneous functions.	2
6	Introduction to Computer-Aided-Part-Programming: basic elements of APT programming language, geometry commands, setup commands, tool motion commands.	2

Student Outcomes addressed by the course: (Put a √ sign)

(a)	an ability to apply knowledge of mathematics, science, and engineering	√
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	√
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	√
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

Key Student Outcomes assessed in the course: ( ) and ( )

Instructor or course coordinator: Dr. Raed Reda Obaid
Last updated: Jan. 2013