

Philadelphia University Faculty of Engineering Department of Computer Engineering First Semester, 2008/2009

Course Syllabus

Course Title: Reverse Engineering	Course code: (610307, 630307, 650307)					
Course Level: Fourth Year	Course prerequisite: Engineering Skills					
Course Level: Fourth Tear	(640306)					
Class Time: 9:10-10:10	Credit hours: 3					

		Academic Staff					
		Specifics					
Name	Rank	Office Number /	Off. Hs	E-mail Address			
1 vullie	INUIIN	Location	011, 115	L-man Auur C55			
			10:00-11:00				
Dr. Mohammed	Assistant	E725	S-T-R	mbaniyounis@philadelphia.edu.je			
Bani Younis	Professor		11:15-12:15	mbamyounis@pintaderpina.edu.j			
			M-W				

Course description:

Reverse Engineering (RE) has become an important Engineering task to obtain knowledge about engineering device or system. RE is an effective learning technique if other "solutions" are available on the market. Applying reverse engineering methodologies allow engineers to disassemble and re-assemble of the device, taking care to document, test, analyze and report on the study of its function. This course Introduces students to Reverse Engineering Methodology through practical projects.

Course objectives:

After the completion of this course, students should be able to:

- Understand the Reverse Engineering (RE) Methodology
- Disassemble products and specify the interactions between its subsystems and their functionality
- Understand Computer-Aided RE and Rapid Prototyping Technology
- Re-draw electrical schematics from available PCBs
- Understand RE applications in software engineering

Teaching methods:

The course will be taken 3 hours class a week in form of power point presentations. During the course, the students will have a final project divide into three parts which will be evaluated over the whole semester. This project will be dedicated to apply the Reverse Engineering methodologies learned in this course. Two Mid Term Examinations will be held during the course.

Learning outcomes: upon completing this course, the student should have:-

Knowledge and understanding

- The basic understanding of engineering systems.
- Understanding the terminologies related to re-engineering, forward engineering, and reverse engineering.
- The Understanding of Reverse Engineering methodologies.
- Understanding of Reverse engineering of Systems, Mechanical RE, Electronic RE, and Computer RE.

Cognitive skills (thinking and analysis)

- Through the project given, the students will be able to disassemble an engineering product and to apply RE methodologies learned throughout this course.
- the students are to write a technical report documenting their work in the project.

Communication skills (personal and academic).

- The group of students which has performed their project in a good way have to present their findings using the communication skills e.g. Power point presentations.

Practical and subject specific skills (Transferable Skills).

The practical skills are applied in the project assigned for the students visiting this course.

Course Intended Learning Outcomes														
A - Knowledge and Understanding														
A1.	A2	A2. A3.		.3.	A4.		A.	5. A6.		A6.		A7.		A8.
	N													
B - Intellectual Skills														
B1.	B2.		B3.		B4.	В	5.	B6.		E	3 7.	B8.		B9.
C - Practical Skills														
C1.	C2.	C3	C3. C		4. C5.		C6.		C7.	. C8.		C9	•	C10.
		N	/	\checkmark										\checkmark
D - Transferable Skills														
D1.		D2.	D2.		3.	. D		4.		D5.		D6.		D7.
\checkmark				1	\mathbf{V}									

Assessment instruments

- Project work including technical report
- First and second exam
- Final examination: 50 marks

Allocation of Marks	
Assessment Instruments	Mark
First examination	15
Second examination	15
Project work (divided into three tasks including final report)	20
Final examination	50
Total	100

Documentation and academic honesty

This course is given from the references provided. It is copyright protected. These references are abstracted in a form of power point presentations. The students are provided with this material in a printed form. The Students are also advised to avoid plagiarism during different home works and Project assignments.

Course academic calendar

Feb 15	Introduction
Feb 22	Forward Engineering Design (Class Notes)
	Design Thought and Process, Design Steps, Mechatronic Systems Design
March 1	System RE (Book Reference 1, Handout #1)
	RE Methodology, RE Steps, System level Design, and Examples
March 8	Product Development (Chapter 1), Product Functions (Chapter 5)
March 15	Product Teardown (Chapter 6)
March 22	Engineering Specifications (Chapter 7)
March 29	Product Architecture (Chapter 9), Exam I
April 5	Mechanical RE (Book References 2, Handout #2, RP Paper)
	Computer-Aided RE (Chapters 1 and 2)
April 12	Rapid Prototyping (Chapter 5)
April 19	Electronic RE (Handout #3, Handout #4, PCB Paper)
	Identify electronic components, PCB RE
April 26	Schematic Drawings and Analysis, Exam II
May 3	Verilog and VHDL
May 10	S/W RE (Book Reference 3, Handout #5)
	Intro to Formal Methods & Software Engineering Methods
May 17	Reverse Engineering in Computer Applications
May 24	Re-engineering of PLC programs
May 31	Final Exams

Project works and reports are in due dates assigned to the students in advance.

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute class. The students are expected to give more time for the project work on an average of one working per project assignment.

Attendance policy:

Absence from classes shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Course references:

- 1. Product Design: Techniques in Reverse Engineering and New Product Development by K. Otto and K. Wood Prentice Hall, 2001.
- 2. Reverse Engineering: An Industrial Perspective by Raja and Fernandes. Springer-Verlag 2008
- 3. Reverse Engineering in Computer Applications. MIT Lecture Notes 2001
- 4. RE as necessary phase by rapid product development by Sokovic and Kopac. Journal of Materials Processing Technology 2005
- 5. A Rapid Prototyping Methodology for Reverse Engineering of Legacy Electronic Systems by Deno, Landis, Hulina, and Sanjay IEEE International Workshop on Rapid System Prototyping, 1999.