

Reverse Engineering 1

Basic Course Information			
Course Number	0105079	Subject Category	Conductivity IM
Class Format	Lecture	Credit Type and Number of Credits	1
Department	Mechatronics	Student Category	Year 1
Period of Study	Semester 2	Classes per Week	2
Required Materials			
Instructor	Sara Tasaddaf		

Course Objective
Reverse engineering, also known as "Back engineering", is the process to reveal its manufacturing principles, functions, and design, or to extract knowledge from the non-manufactured products to observation, disassembling and analysis. The course provides students with a basic idea and knowledge of the reverse engineering and hand-on activities to examine real products. These activities are designed to help the student learn the principles and concept behind the product as well as her/his abilities to design and/or to improve the performance of the products.

Evaluation/Rubric	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Understanding Reverse Engineering Concept	Demonstrates very good understanding of Reverse Engineering Concept with knowledge of related technical details	Demonstrates good understanding of Reverse Engineering Concept with knowledge of related technical details	Lacks the necessary knowledge and understanding of Reverse Engineering Concept
Executing Analysis and Procedure	Demonstrates very good analysis procedures to find principles, function and design of products. Application of obtained knowledge for improvement	Demonstrates good analysis procedures to find principles, function and design of products	Lacks the necessary knowledge or analysis procedures to find principles, function and design of products
Observation and Analysis	Observation and analysis are both accurate and precise. Logically organize the obtained information to find principles, function and design of products	Observation and analysis are enough to obtain information to find principles, function and design of products	Observation and analysis are incomplete, inaccurate and imprecise
Presentation	Presentation slides are well organized. Effectively presents ideas and information in logical sequence which audience can follow	Presentation slides are organized. Presents ideas and information in logical sequence	Presentation slides are not well organized. Presents ideas and information, but the audience feel difficulty to follow the sequence or
Group work	Almost always listens to and support others. Shares ideas with others positively, and helps the team to solve the problem	Usually or try to listen by others. Shares ideas with, and positively supports others.	Hardly listens to others. Do not share with, and supports others. Often is not a good team player

Relationship with Learning Outcomes
M(1) Ability to design, process and develop robotic/ mechatronic systems to solve specific problems
M(2) Ability to design, process and develop electrical and electronic systems for robotics/ mechatronic systems
M(3) Ability to design, process and develop mechanical solutions/ systems for robotics/ mechatronic systems

Teaching Method	
Outline:	Students will study the concept and methodology of Reverse Engineering. Student will apply their skills, knowledge and learning through case study
Class Format:	Lecture and group work
Please Note :	Hand-on activities will be provided. Safety rules will be applied

Course Plan	Semester 2	Contents and Method of Course	Goals	Related MCC
Week 1		Introduction to Reverse Engineering: 1	Explaining Introduction to Reverse Engineering: 1	B-1, 5, 10
Week 2		Product Manufacturing, Design, and Functions/Basic digital Instruments	Explaining Product Manufacturing, Design, and Functions/Basic digital Instruments	B-1, 5, 10
Week 3		Analysis techniques and methods	Explaining Analysis techniques and methods	B-1, 5, 10
Week 4		Hand-on activities: 1: Variable Resistor	Explaining Hand-on activities: 1: Variable Resistor	B-1, 4, 10 C-1, 1, 2 C-2, 1, 2 C-3, 5, 10
Week 5		Hand-on activities: Disassembling and Analysis variable resistor	Explaining Hand-on activities: Disassembling and Analysis variable resistor	B-1, 4, 10 C-1, 1, 2 C-2, 1, 2 C-3, 5, 10
Week 6		DC Motor Analysis	Explaining DC Motor Analysis	V-C 5, 6B
Week 7		Hand-on activities: DC motor speed test and observation	Explaining Hand-on activities: DC motor speed test and observation	B-1, 4, 10 B-4, 5, 10
Week 8		Reporting results 1	Explaining Reporting results 1	
Week 9		Midterm Examination	For week 1 - 8	
Week 10		DC motor Disassembling and Analysis	Explaining DC motor Disassembling and Analysis	B-1, 4, 10 B-4, 5, 10
Week 11		Hand-on activities 3: Serrvomotor analysis	Explaining Hand-on activities 3: Serrvomotor analysis	
Week 12		Hand-on activities 3: Serrvomotor disassembling	Explaining Hand-on activities 3: Serrvomotor disassembling	
Week 13		Relay Module	Explaining Relay Module	
Week 14		Reporting results 1: Signal Condition	Explaining Reporting results 1: Signal Condition	
Week 15		Hand-on activities 4: Hair drier (study & observation) (1)	Explaining Hand-on activities 4: Hair drier (study & observation) (1)	B-1, 4, 10 C-1, 1, 2 C-2, 1, 2 C-3, 5, 10
Week 16		Hand-on activities 4: Hair drier (study & observation) (2)	Explaining Hand-on activities 4: Hair drier (study & observation) (2)	
Week 17		Hand-on activities 4: Hair drier (study & observation) (3)	Explaining Hand-on activities 4: Hair drier (study & observation) (3)	
Week 18		Report	Explaining the past work	
Week 19		Final Examination	For week 11 - 18	
Week 20		Wrap-up of the semester (Review)	Review and summarize learning	

Course Ability	Assessment/Strategy	Assessment/Strategy	Assessment/Strategy	Assessment/Strategy	Assessment/Strategy
Conceptual Ability					
Technical Ability					
Problem Solving Ability					

Do not