



## 53.Course Specification of Graduation Project

I.Course Identification and General Information:						
.1	Course Title:	Graduation Project.				
.2	Course Code & Number:	MT405.				
.3	Credit Hours:	C.H.				TOTAL CR. HRS.
		Th.	Seminar	Pr.	Tu.	
		1	-	2	-	
.4	Study Level/ Semester at which this Course is offered:	Fifth Year - First and Second Semesters.				
.5	Pre –Requisite (if any):	To fulfil the requirements of the Faculty and the courses required by specific projects as determined by the supervisor.				
.6	Co –Requisite (if any):	None.				
.7	Program (s) in which the Course is offered:	Mechatronics Engineering Program.				
.8	Language of Teaching the Course:	English Language.				
.9	Location of Teaching the Course:	Mechatronics Engineering Department.				
.10	Prepared by:	Associate Prof. Dr. Abdul-Malik Momin.				
.11	Date of Approval:					

II.Course Description:
Graduation project (GP) provides graduating students with opportunities to optimally and professionally apply skills they have accumulated during their course of study into practical engineering design practice and/or research areas. GP is carried out in two phases, in first and second semesters of the final year. Students enrolling in the GP will apply advance academic writing skills including technical reports, research proposals, papers and documentation of engineering projects. They will also obtain firm understanding of the procedures and steps of real word engineering designing/or research projects and express the ability to work in groups.

III.Course Intended learning outcomes (CILOs) of the course	Referenced PILOs
a1. Recall the basic knowledge of basic engineering sciences subjects.	A1
a2. Characterize the basic principles of design regarding the Mechatronics systems.	A2
a3. Describe the basics of computer skills.	A8
b1. Explore suitable methods for solving mechatronics problems.	B1
b2. Contrast the problems related to the real applications.	B2

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<b>b3.</b>	Explore innovative solutions for industrial applications.	B3
<b>c1.</b>	Implement experiments in the specialized areas.	C1
<b>c2.</b>	Solve engineering problems using appropriate software.	C2
<b>c3.</b>	Apply feasibility studies for graduation project.	C4
<b>c4.</b>	Perform with standard specifications during the design.	C5
<b>d1.</b>	Co-operate in a team work.	D1
<b>d2.</b>	Assess to technical reports through different forms.	D6
<b>d3.</b>	Review a literature from different sources.	D7

<b>(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
Recall the basic knowledge of basic engineering sciences subjects. <b>a1.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Laboratory Experiments.</li> </ul>	<ul style="list-style-type: none"> <li>Interactive Discussion.</li> <li>Course Work Assignment.</li> </ul>
Characterize the basic principles of design regarding the Mechatronics systems. <b>a2.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Simulation and Practical Project.</li> <li>Laboratory Experiment.</li> </ul>	<ul style="list-style-type: none"> <li>Presentation.</li> <li>Written Assessment.</li> </ul>
Describe the basics of computer skills. <b>a3.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Working in a Computer Lab.</li> </ul>	<ul style="list-style-type: none"> <li>Written Assessment.</li> <li>Presentation.</li> </ul>

<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
Explore suitable methods for problems. solving mechatronics <b>b1.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Orientation and Organization.</li> </ul>	<ul style="list-style-type: none"> <li>Written Reports and Seminar.</li> <li>Field Supervision Report.</li> </ul>
Contrast the problems related to the real applications. <b>b2.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> </ul>	<ul style="list-style-type: none"> <li>Written Reports and Seminar.</li> </ul>
Explore innovative solutions for industrial applications. <b>b3.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> </ul>	<ul style="list-style-type: none"> <li>Written Reports and Seminar.</li> </ul>

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**© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
Implement experiments in the specialized areas. <b>c1.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Lab. Specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Seminar.</li> <li>Lab. Report.</li> </ul>
Solve engineering problems using appropriate software. <b>c2.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Application of Different Software.</li> </ul>	<ul style="list-style-type: none"> <li>Seminar.</li> <li>Presentation.</li> </ul>
Apply feasibility studies for graduation project. <b>c3.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> </ul>	<ul style="list-style-type: none"> <li>Written Reports.</li> </ul>
Perform with standard specifications during the design. <b>c4.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> <li>Orientation to Select Standard Specifications.</li> </ul>	<ul style="list-style-type: none"> <li>Seminar.</li> </ul>

**(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
Co-operate in a team work. <b>d1.</b>	<ul style="list-style-type: none"> <li>Orientation and Organization.</li> </ul>	<ul style="list-style-type: none"> <li>Seminar.</li> <li>Field Supervision Report.</li> <li>Academic Supervision Report.</li> </ul>
Assess to technical reports through different forms. <b>d2.</b>	<ul style="list-style-type: none"> <li>Orientation and Organization.</li> <li>Academic Staff to Support the Students.</li> </ul>	<ul style="list-style-type: none"> <li>Seminar.</li> <li>Academic Staff Report.</li> </ul>
Review a literature from different sources. <b>d3.</b>	<ul style="list-style-type: none"> <li>Active Lectures.</li> </ul>	<ul style="list-style-type: none"> <li>Assessment of a Team Work.</li> <li>Academic Staff Report.</li> </ul>

**IV. Course Structure:**

- A team of 3-4 students supervised by an academic staff.
- Weekly follow-up scheme through the supervisor.
- Course schedule and its completion taking into account the dead line for the completion of the graduation project.
- Workshops on project management, ethics, and concept of design process specifications, quality assurance, safety and cost effectiveness.

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- Submission of the final graduation project to the department.
- Seminar and assessment.

### V.Course Schedule:

Lecturing graduation project students during the preparation phase (project orientation, advance writing and citation) will be conducted during 3 weeks before starting of the first semester as a preparation phase report. The department will assign advisor (academic staff) and coordinator to support the academic staff.

Week	Date	Advisor Activity (Academic Staff)	Co-ordinator Activity
1 <sup>st</sup>		To assess that the chosen project is acceptable as a graduation project and submitting the ideas to the coordinator.	Prepare a list of the proposed projects and supervisors.
2 <sup>nd</sup>		Supervising and providing advices for the students activities.	Discuss proposed projects with students.
6 <sup>th</sup>		To assess that students have kept continuous contact during the work and have been on time to send all the materials collected to the supervisor.	Meeting with the students weekly to evaluate to evaluate their progress, presentation skills and interaction.
7 <sup>th</sup>		Evaluate each group and their performance during the semester.	Enhance critical thinking between teams and improve their skills.
8 <sup>th</sup>		First report review and evaluation.	First report evaluation.
9 <sup>th</sup>		Provide feedback to team members upon receiving the coordinator evaluation comments.	Weekly meeting with team members for the assessment.
10 <sup>th</sup> -12 <sup>th</sup>		To assess that students have completed tasks and delivered documents expected in the first half of the semester. It includes both demonstration and presentation of the work.	Weekly meeting with team members for the assessment.
13 <sup>th</sup>		Assess and evaluate the work done during the first semester and second report review and evaluation.	Review second report, assess and evaluate the work done during the first semester.

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14 <sup>th</sup>	Discuss and evaluate the performance tasks in the first semester and agree on the plan for the second semester.	Evaluate the performed tasks in the first semester and agree on the plan for the second semester.
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### Notes:

- The second semester will be completed on the tasks given from the advisor and coordinator.
- Students will continue their work during the second semester to perform the tasks indicated.
- Supervisors and coordinator will continue their activities for the assessment.
- Each group of students required to discuss the completeness of the project.
- The final assessment and presentation of the graduation project will be implemented at the end of the second semester.

## VI. Teaching Strategies of the Graduation Project Course:

The teaching strategies of the course are as follows:

1. Active lectures.
2. Survey and research work.
3. Application of the different software.
4. Laboratory experiments.
5. Orientation and organization.
6. Academic staff to support the students.
7. Performing analytical and computer aided simulation work.
8. Performing experimental work.
9. Writing up the final thesis.
10. Presenting the graduation project work.
11. Seminar and assessment through the committee.

## VII. Advisor Responsibilities:

1. Discuss proposed projects with students.
2. Require a project description from the teams at the end of the first week.
3. Require a budget proposal at the end of the eleventh week.
4. Evaluate each group performance during the semester.
5. Provide feedback to the team members upon receiving the coordinator evaluation sheet.

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### VIII.Coordinator Responsibilities:

1. Meeting with the teams on a weekly basis to evaluate their progress, presentation skills and class interaction.
2. Enhance critical thinking between the teams.
3. Improve the skills of delivery of the assigned teams.
4. Follow-up scheme to ensure that the progress is going on.

### IX.Students Assignments or Reports:

Order	Title or Description of these Assignments or Reports	When are these Assignments or Reports Required?
1.	First progress report.	At the end of the 8 <sup>th</sup> week of the first semester.
2.	Second progress report.	At the end of the 13 <sup>th</sup> week of the first semester.
3.	Third progress report.	At the end of the 4 <sup>th</sup> week of the second semester.
4.	Fourth progress report.	At the end of the 6 <sup>th</sup> week of the second semester.
5.	Fifth progress report.	At the end of the 7 <sup>th</sup> week of the second semester.
6.	Sixth progress report.	At the end of the 12 <sup>th</sup> week of the second semester.

### X.Students Follow-Up:

1. The students should meet the advisor weekly.
2. The students should meet the coordinator weekly.
3. Group meetings.
4. Attending special lectures.
5. To present progress report.
6. Field trip if it is possible.

### XI.Student Assessment:

#### A. Bases of Assessment:

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Order	Authority	Mark
1.	Advisor.	40 %
2.	Coordinator.	20 %
3.	Final Exam Committee.	40 %
<b>Total</b>		<b>100%</b>

### B. Graduation Projects Examination Guidelines:

Examination committee members will observe the following guidelines:

- Clarity of project objective.
- Approach selection.
- Detailed plan of the completion.
- Ensuring that each group has prepared their graduation project according to the "Writing Report Guidelines".

### XII. Facilities Required:

1.	Accommodation.	a. Lecture rooms. b. Labs. for the computer work and experimental work.
2.	Other Resources.	Practical workshop for the implementation of the work such as: designing, forming and soldering.

### XIII. Course Evaluation and Improvement Processes:

#### 1. Strategies for obtaining student feedback on effectiveness of teaching:

- By using course evaluation questionnaire, self-evaluation and peer evaluation.
- By using group discussions in the departmental meeting.
- Peer evaluation for evaluating effectiveness of teaching.

#### 2. Other strategies for evaluation of teaching through the department:

- Through course file.
- Through the head of the department.
- Observations from colleagues in the department.
- Periodic staff review.

#### 3. Processes for improvement of teaching:

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<ul style="list-style-type: none"> <li>• Interview with group of students.</li> <li>• Training of teachers.</li> <li>• Updating of knowledge through internet.</li> <li>• Course committee meeting at least one per semester.</li> </ul>
<b>4. Processes for verifying standards of students' achievement:</b>
<ul style="list-style-type: none"> <li>• Review from examination committee of the Faculty.</li> <li>• Checking the marking of exams with the help of the answer key.</li> </ul>
<b>5. Description of the planning procedures for periodically reviewing of course effectiveness and planning for improvement:</b>
<ul style="list-style-type: none"> <li>• The courses should be reviewed every 5 years.</li> <li>• Periodic modification of the course references.</li> <li>• Enhancement of the process through quality assurance at the Faculty.</li> </ul>
<b>6. Course development plans:</b>
<ul style="list-style-type: none"> <li>• Evaluation of the comments available in the course report.</li> <li>• Updating of the knowledge in each course.</li> <li>• Updating of textbooks and references.</li> <li>• Updating of experimental work in the workshops.</li> </ul>

<b>I. Learning Resources:</b>	
<ul style="list-style-type: none"> <li>• Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).</li> </ul>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
	All the related text books available in the library. Manuals and Catalogues available in the firms.
<b>2- Essential References.</b>	
	-
<b>3- Electronic Materials and Web Sites etc.</b>	
	-

<b>II. Course Policies:</b>	
.1	<b>Class Attendance:</b> The students should have more than 75 % of attendance according to rules and regulations of the Faculty.
.2	<b>Tardy:</b>

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	The students should respect the timing of attending the lectures. They should attend within 10 minutes from starting of the lecture.
.3	<b>Exam Attendance/Punctuality:</b> The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for mid-term exam and final exam.
.4	<b>Assignments &amp; Projects:</b> The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time.
.5	<b>Cheating:</b> If any cheating occurred during the examination, the student is not allowed to continue and he has to face the examination committee for <b>enquiries</b> .
6.	<b>Plagiarism:</b> The student will be terminated from the Faculty, if one student <b>attends</b> the exam on another university. behalf according to the policy, rules and regulations of the
7.	<b>Other Policies:</b> <ul style="list-style-type: none"> <li>• All the teaching materials should be kept out the examination hall.</li> <li>• The mobile phone is not allowed.</li> <li>• There should be a respect between the student and his teacher.</li> </ul>

Reviewed By	Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat. President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi. Asst. Prof. Dr. Hatem Al-Dois.
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