Sana'a University
Faculty of Engineering
Mechanical Engineering Department
Mechanical Engineering Program

44. Course Specification of Automatic Control

I. Course Identification and General Information:

1.	Course Title:	Automatic Control.				
2.	Course Code & Number:	ME324.				
3.	Credit Hours:	C.H				Total Cr. Hrs
		Th.	Seminar/Tu	Pr	Tr.	
		2	-	2	-	3
4.	Study level/ semester at which this course is offered:	Fourth Year - First Semester.				
5.	Pre –requisite (if any):	Differential Equations and Electronic Circuits.				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered:	Mechanical Engineering Program				
8.	Language of teaching the course:	English Language				
9.	Location of teaching the course:	Mechanical Engineering Department				
10.	Prepared By:	Asst. Prof. Dr. Mohammed Abdullah Al-Olofi				
11.	Date of Approval:					

II. Course Description:

The course introduces the basic concepts of analog control systems, and develops knowledge for model, analysis, and design of analog feedback control systems. It includes examples of feedback control systems – dynamics characteristics – Mathematical modeling of control systems using transfer function model and state variable model – analysis of control system in transfer function model and state variable model – block diagrams reduction and signal flow graphs – characteristics and performance of feedback control systems – transient response analysis - stability analysis - Root-Locus method – PID controllers – Frequency response method - Logarithmic plots – Bode diagram method – introduction to design, series and feedback compensation - State space design methods – controllability and observability – design of linear feedback control systems – linear time varying state models – pole placement design method – observer design method – transfer function of controller.

Head of Department	Quality Assurance Unit	Dean of the Faculty	Academic Development Center & Quality Assurance	Rector of Sana'a University
Asst. Prof. Dr. Adel Ahmed Al-Shakiri	Assoc. Prof. Dr. Mohammad Algorafi	Prof. Dr. Mohammed AL-Bukhaiti	Assoc. Prof. Dr. Huda Al-Emad	Prof. Dr. Al-Qassim Mohammed Abbas

	III. Alignments of the Course Intended learning outcomes (CILOs)	Referenced PILOs
a1	Show the concepts and the mathematical modeling of analog feedback control systems in transfer function model and state variable model.	A1
a2	Explain basic principles, components of analog control systems, and application of analog control systems in mechanical systems.	A3
b1	Analyze the mechanical engineering systems using the modern control engineering tools.	B1
b2	Design the analog controllers and the others components of the mechanical products by using the control system design methods.	B2
c1	Apply the analog control system tools to measure and evaluate the mechanical systems performance.	C1
c2	Employ the information technology tools to solve the control systems problems in the field of mechanical systems.	C2
d1	Work productively as an individual and as a member of a team / multi-disciplinary team.	D1
d2	Effectively manage project tasks, time and resources.	D2
d3	Engage in independent lifelong learning.	D3

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(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Show the concepts and the mathematical modeling of analog feedback control systems in transfer function model and state variable model.	Lectures, Tutorials Seminars	Reports, Homework Presentations
a2- Explain basic principles, components of analog control systems, and application of analog control systems in mechanical systems.	Lectures, Tutorials, Seminars, Projects.	Homework Presentations, Individual and Group Project Reports

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Analyze the mechanical engineering systems using the modern control. engineering tools.	Lectures, Tutorials, Seminars, Projects	Examinations, Homework, Presentations, Individual and Group Project Reports
b2- Design the analog controllers and the others components of the mechanical products by using the control system design methods.	Lectures, Tutorials, Seminars, Projects	Examinations, Homework, Presentations, Individual and Group Project Reports

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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
c1- Apply the analog control system tools to measure and evaluate the mechanical systems performance.	Lectures, Seminars, Projects, Small Group	Presentations, Individual and Group Project Reports.
c2- Employ the information technology tools to solve the control systems problems in the field of mechanical systems.	Lectures, Seminars, Projects, Small Group	Presentations, Individual and Group Project Reports.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Work productively as an individual and as a member of a team / multi-disciplinary team.	Seminars, Projects, Small Group	Presentations, Reports
d2- Effectively manage project tasks, time and resources.	Tutorials, Seminars, Projects, Small Group	Presentations, Reports.
d3 - Engage in independent lifelong learning.	Seminars, Assignments, Projects.	Presentations, Reports

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1	Introduction of Control Systems.	a1, a2	Introduction of Control Systems, Types of Control Systems, Components, Steps to Design A Control Systems.	1	2
2	Mathematical Models of Systems.	a1, a2, b1, b2, c1, c2	Mathematical Models of Electrical, Mechanical, Thermal, Fluid, Hydraulic Systems, Differential Equation, Linear Approximation of Control Systems, Laplace Transform And Theorems , Transfer Function Models, S-Plane Analysis of Feedback Control Systems, Block Diagram Reduction, Signal Flow Graph	1	2
3	State-Variable Models.	a1, a2, b1, b2, c1, c2	State-Variable Model, Analysis in State-Variable, Transform From State-Variable Model to Transfer Function Model	1	2
4	Feedback Control System Characteristics.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Feedback Control System Characteristics, Error Signal Analysis, Sensitivity of Feedback Control System to Parameters Variation, Disturbance and Noise Signal Rejection, Cost of Feedback Control System, Design Examples.	1	2
5	Performance of The Feedback Control System.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Performance of 2nd Order Feedback Control System, Test Input Signals, Steady-State Error of Feedback	1	2

			Control System, Performance Index of Feedback Control Systems, Design Examples.		
6	The Stability of Feedback Control System.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Stability Analysis of Feedback Control System, The Routh-Hurwitz Stability Criterion, Relative Stability, Stability of State Variable Systems, Design Examples.	1	2
7	The Root Locus Method.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Root Locus Concept, Root Locus Procedures,	1	2
8	Mid-Term Exam.	a1, a2, b1, b2, c1, c2	The First Seven Chapters	1	2
9	The Root Locus Method.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Parameters Design By the Root Locus, PID Controllers, Design Examples	1	2
10	Frequency Response Methods.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Frequency Response Plots, Bode Diagram, Frequency Response Measurements, Performance Specifications in Frequency Response, Design Example	1	2
11	The Design of Feedback Control Systems.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Approaches to System Design, Cascade Compensation Networks, Phase-Lead Design Using the Bode Diagram and Root Locus, System Design using Integration Networks, Phase-Lag Design Using the Bode Diagram and Root Locus, Design on the Bode Diagram using Analytical Methods, Systems with A Pre-Filter, Design for Dead Beat Response, Design Examples.	3	6

12	The design of state variable feedback control systems.	a1, a2, b1, b2, c1, c2, d1, d2, d3	Controllability and Observability, Full-State Feedback Control Design, Observer Design, Integrated Full-State Feedback and Observer, Reference Inputs, Internal Model Design, Design Examples	2	4
13	Final Exam.	a1, a2, b1, b2, c1, c2	All the Chapters	1	2
Number of Weeks /and Units Per Semester				**16**	**32**

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B - Practical Aspect:

Order	Tasks/ Experiments	Week Due	Contact Hours	Learning Outcomes
1	Introduction of Analog Control Systems.	1	2	a1, a2
2	Introduction of Matlab Software.	2	2	a1, a2,b1, b2, c2, d2
3	Control Systems Toolbox in Matlab Software.	3, 4	4	a2, c1, c2, b1, d1, d2, d3
4	Mathematical Models of Analog Control System in Matlab Software.	5, 6	4	a1, a2, b1, b2, c1, c2, d1, d2, d3
5	Block Diagram Reduction in Matlab Software.	7	2	a1, a2, b1, b2, c1, c2, d1, d2, d3
6	Mid Term Practical Exam.	8	2	a1, a2, b1, b2, c1, c2
7	Analysis of Analog Control Systems Response and Performance .	9	2	a1, a2, b1, b2, c1, c2, d1, d2, d3
8	Root Locus Method in Matlab Program.	10	2	a1, a2, b1, b2, c1, c2, d1, d2, d3
9	Bode Plot Method in Matlab Program.	11	2	a1, a2, b1, b2, c1, c2, d1, d2, d3
10	Analog Controller Design Method in Matlab Program.	12	2	a1, a2, b1, b2, c1, c2, d1, d2, d3
11	Analog Control System Simulation in Matlab Program.	13	2	a1, a2, b1, b2, c1, c2, d1, d2, d3
12	Final Practical Exam .	14	2	a1, a2, b1, b2, c1, c2

Number of Weeks /and Units Per Semester	**14**	**28**	

V. Teaching strategies of the course:

- Active Lectures (supported with discussions).
- Hands-on Laboratory Work.
- Independent Learning and Work.
- Group Learning and Problem-Based Learning.
- Field Classes.
- Independent Applications of Engineering Analysis.
- Seminars, Journal Clubs and Workshops.
- The use of Communication and Information Technology.
- Computer and Web-Based Learning.
- Case Studies.

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Problems, and Advance Problems, and Computer Problems of the Chapter 2	a1, a2, b1, c1	2	2
2	Problems, and Advance Problems, and Computer Problems of the Chapter 3	a1, a2, b1, c1, c2, d2, d3	3	2
3	Problems, and Advance Problems, and Computer Problems of the Chapter 4, 5	a1, a2, b1, b2, c1, c2, d2, d3	5	2
4	Problems, and Advance Problems, and Computer Problems of the Chapter 6, 7	a1, a2, b1,b2, c1, c2, d2, d3	9	2
5	Problems, and Advance Problems, and Computer Problems of the Chapter 8	a1, a2, b1,b2, c1, c2, d2, d3	10	4

6	Problems, and Advance Problems, and Computer Problems of the Chapter 10	a1, a2, b1,b2, c1, c2, d2, d3	13	4
7	Problems, and Advance Problems, and Computer Problems of the Chapter 11	a1, a2, b1,b2, c1, c2, d2, d3	15	4
Total				**20**

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	Every 3 weeks	10	6.67%	a1, a2, b1, b2, c1,c2, d2, d3
2	Assignments	Weekly	20	13.3%	a1, a2, b1, b2, c1,c2, d2, d3
3	Mid-Term Exam	8th	15	10%	a1, a2, b1, b2, c1,c2
4	Practical Projects	12th	15	10%	a1, a2, b1, b2, c1,c2, d1,d2,d3
5	Final Exam Practical	15th	15	10%	a1, a2, b1, b2, c1,c2
6	Final Exam Theory	16th	75	50%	a1, a2, b1, b2, c1,c2
Total Assessments Mark/Percentage			**150**	**100%**	

VIII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

Richard C. Dorf, Robert H. Bishop, 2013, Modern Control Systems, 12th Edition, Prentice Hall.

2- Essential References.

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	1. Katsuhiko Ogata, 2010, Modern Control Engineering, 5th Edition, Prentice Hall.
3- Electronic Materials and Web Sites *etc*.	
	1. http://www.sciencedirect.com/ 2. http://dl.acm.org/dl.cfm 3. http://ieeexplore.ieee.org/Xplore/guesthome.jsp 4. http://www.emeraldinsight.com 5. http://www.scopus.com/home.url 6. http://link.springer.com/

I. Course Policies:

1	**Class Attendance:** - The student should be attending not less than 75% of total contact hours of the subject, otherwise he will not able to take exam and be considerd as an exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic.
2	**Tardy:** - For lateness in attending the class, the student will be initially notified. If he repeates late in attending class he will be considered absent.
3	**Exam Attendance/Punctuality:** - The student should attend the exam on time. He is permitted to attend the exam half one hour from exam beginning, after that he/she will not be permitted to take exam and he/she is considered absent in the exam.
4	**Assignments & Projects:** - In general one assignment is given after each chapter of a course. The student should submit the assignment on time, mostly one week after giving the assignment
5	**Cheating**: - For cheating in exam, the student is considered as failure. In case the cheating is repeated three times during study the student will be disengaged from the Faculty
6	**Plagiarism**: Plagiarism is the attending of the student the exam of a course instead of other student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Affair Council of the university.
7	**Other policies:**

	- The mobile phone is not allowable to be used during class lecture. It must be switched off, otherwise the student will be ordered to leave the lecture room. - The mobile phone is not allowed to be taken during the examination time. - Lecture notes and assignments may be given directly to students using soft or hard copy.

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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** **Name of Reviewer from the Department: Asst. Prof. Dr. Eng. Hamoud A. Al-Nahari**
	Deputy Rector for Academic Affairs Asst. Prof. Dr. Ibrahim AlMutaa **Assoc. Prof. Dr. Ahmed Mujahed** **Asst. Prof. Dr. Munasar Alsubri**

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44. Course Plan of Automatic Control

Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Mohammed Abdullah Al-olofi	**Office Hours**					
Location& Telephone No.	00967-773703712	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail	Al_olfe2001@yahoo.com						

II. Course Identification and General Information:						
1.	Course Title:	Automatic Control.				
2.	Course Number & Code:	ME324.				
3.	Credit Hours:	C.H				Total Cr. Hrs
		Th.	Seminar/Tu.	Pr.	Tr.	
		2	-	2	-	3
4.	Study level/year at which this course is offered:	Fourth Year - First Semester.				
5.	Pre –requisite (if any):	Differential Equations and Electronic Circuits.				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered	Mechanical Engineering Program.				
8.	Language of teaching the course:	English Language.				
9.	System of Study:	Semesters.				
10.	Mode of delivery:	Lectures and Practical.				
11.	Location of teaching the course:	Mechanical Engineering Department				

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III. Course Description:

The course introduces the basic concepts of analog control systems, and develops knowledge for model, analysis, and design of analog feedback control systems. It includes examples of feedback control systems – dynamics characteristics – Mathematical modeling of control systems using transfer function model and state variable model – analysis of control system in transfer function model and state variable model – block diagrams reduction and signal flow graphs – characteristics and performance of feedback control systems – transient response analysis - stability analysis - Root-Locus method – PID controllers – Frequency response method - Logarithmic plots – Bode diagram method – introduction to design, series and feedback compensation - State space design methods – controllability and observability – design of linear feedback control systems – linear time varying state models – pole placement design method – observer design method – transfer function of controller.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1. Show the concepts and the mathematical modeling of analog feedback control systems in transfer function model and state variable model.
2. Explain basic principles, components of analog control systems, and application of analog control systems in mechanical systems.
3. Analyze and evaluate the mechanical engineering systems using the modern control engineering tools.
4. Design the analog controllers and the others components of the mechanical products by using the control system design methods.
5. Apply the analog control system tools to measure and evaluate the mechanical systems performance.
6. Employ the information technology tools to solve the control systems problems in the field of mechanical systems.
7. Work productively as an individual and as a member of a team / multi-disciplinary team.
8. Effectively manage project tasks, time and resources.
9. Engage in independent lifelong learning.

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V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	Contact Hours
1	Introduction of Control Systems	Introduction of Control Systems, Types of Control Systems, Components, Steps to Design A Control Systems.	1st	2
2	Mathematical Models of Systems.	Mathematical Models of Electrical, Mechanical, Thermal, Fluid, Hydraulic Systems, Differential Equation, Linear Approximation of Control Systems, Laplace Transform And Theorems , Transfer Function Models, S-Plane Analysis of Feedback Control Systems, Block Diagram Reduction, Signal Flow Graph	2nd	2
3	State-Variable Models	State-Variable Model, Analysis in State-Variable, Transform From State-Variable Model to Transfer Function Model	3rd	2
4	Feedback Control System Characteristics	Feedback Control System Characteristics, Error Signal Analysis, Sensitivity of Feedback Control System to Parameters Variation, Disturbance and Noise Signal Rejection, Cost of Feedback Control System, Design Examples.	4th	2
5	Performance of The Feedback Control System	Performance of 2nd Order Feedback Control System, Test Input Signals, Steady-State Error of Feedback Control System, Performance Index of Feedback Control Systems, Design Examples.	5th	2
6	The Stability of Feedback Control System	Stability Analysis of Feedback Control System, The Routh-Hurwitz Stability Criterion, Relative Stability, Stability of State Variable Systems, Design Examples.	6 th	2

7	The Root Locus Method	Root Locus Concept, Root Locus Procedures,	7 th	2
8	Mid Term Exam.	The First Seven Chapters	8 th	2
9	The Root Locus Method	Parameters Design By the Root Locus, PID Controllers, Design Examples	9 th	2
10	Frequency Response Methods	Frequency Response Plots, Bode Diagram, Frequency Response Measurements, Performance Specifications in Frequency Response, Design Example	10 th	2
11	The Design of Feedback Control Systems	Approaches to System Design, Cascade Compensation Networks, Phase-Lead Design Using the Bode Diagram and Root Locus, System Design using Integration Networks, Phase-Lag Design Using the Bode Diagram and Root Locus, Design on the Bode Diagram using Analytical Methods, Systems with A Pre-Filter, Design for Dead Beat Response, Design Examples.	11 th, 12th, 13 th	6
12	The design of state variable feedback control systems	Controllability and Observability, Full-State Feedback Control Design, Observer Design, Integrated Full-State Feedback and Observer, Reference Inputs, Internal Model Design, Design Examples	14 th, 15th	4
13	Final Exam	All the Chapters	16 th	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Week Due	Contact Hours
1	Introduction of Analog Control Systems.	1st	2
2	Introduction of Matlab Software.	2nd	2
3	Control Systems Toolbox in Matlab Software.	3rd, 4th	4

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4	Mathematical Models of Analog Control System in Matlab Software.	5 th, 6 th	4
5	Block Diagram Reduction in Matlab Software.	7 th	2
6	Midterm Practical Exam	8 th	2
7	Analysis of Analog Control Systems Response and Performance	9 th	2
8	Root Locus Method in Matlab Program.	10 th	2
9	Bode Plot Method in Matlab Program.	11 th	2
10	Analog Controller Design Method in Matlab Program.	12 th	2
11	Analog Control System Simulation in Matlab Program.	13 th	2
12	Final Practical Exam .	14 th	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VI. Teaching strategies of the course:

- Active Lectures (supported with discussions).
- Hands-on Laboratory Work.
- Independent Learning and Work.
- Group Learning and Problem-Based Learning.
- Field Classes.
- Independent Applications of Engineering Analysis.
- Seminars, Journal Clubs and Workshops.
- The use of Communication and Information Technology.
- Computer and Web-Based Learning.
- Case Studies.

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Problems, and Advance Problems, and Computer Problems of the Chapter 2	a1, a2, b1, c1	2	2

2	Problems, and Advance Problems, and Computer Problems of the Chapter 3	a1, a2, b1, c1, c2, d2, d3	3	2
3	Problems, and Advance Problems, and Computer Problems of the Chapter 4, 5	a1, a2, b1, b2, c1, c2, d2, d3	5	2
4	Problems, and Advance Problems, and Computer Problems of the Chapter 6, 7	a1, a2, b1,b2, c1, c2, d2, d3	9	2
5	Problems, and Advance Problems, and Computer Problems of the Chapter 8	a1, a2, b1,b2, c1, c2, d2, d3	10	4
6	Problems, and Advance Problems, and Computer Problems of the Chapter 10	a1, a2, b1,b2, c1, c2, d2, d3	13	4
7	Problems, and Advance Problems, and Computer Problems of the Chapter 11	a1, a2, b1,b2, c1, c2, d2, d3	15	4
Total				**20**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	Every 3 weeks	10	6.67%	a1, a2, b1, b2, c1,c2, d2, d3
2	Assignments	Weekly	20	13.3%	a1, a2, b1, b2, c1,c2, d2, d3
3	Mid-Term Exam	8 th	15	10%	a1, a2, b1, b2, c1,c2
4	Practical Projects	12 th	15	10%	a1, a2, b1, b2, c1,c2, d1,d2,d3
5	Final Exam Practical	15 th	15	10%	a1, a2, b1, b2, c1,c2
6	Final Exam Theory	16 th	75	50%	a1, a2, b1, b2, c1,c2,
Total Assessments Mark/Percentage			**150**	**100%**	

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IX. Learning Resources:

- *Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1. Richard C. Dorf, Robert H. Bishop, 2013, Modern Control Systems, 12th Edition, Prentice Hall.

2- Essential References.

1. Katsuhiko Ogata, 2010, Modern Control Engineering, 5th Edition, Prentice Hall.

3- Electronic Materials and Web Sites *etc*.

1. http://www.sciencedirect.com/
2. http://dl.acm.org/dl.cfm
3. http://ieeexplore.ieee.org/Xplore/guesthome.jsp
4. http://www.emeraldinsight.com
5. http://www.scopus.com/home.url
6. http://link.springer.com/

II. Course Policies:

1	**Class Attendance:** - The student should be attending not less than 75% of total contact hours of the subject, otherwise he will not able to take exam and be considerd as an exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic.
2	**Tardy:** - For lateness in attending the class, the student will be initially notified. If he repeates late in attending class he will be considered absent.
3	**Exam Attendance/Punctuality:** - The student should attend the exam on time. He is permitted to attend the exam half one hour from exam beginning, after that he/she will not be permitted to take exam and he/she is considered absent in the exam.
4	**Assignments & Projects:** - In general one assignment is given after each chapter of a course. The student should submit the assignment on time, mostly one week after giving the assignment
5	**Cheating**: - For cheating in exam, the student is considered as failure. In case the cheating is repeated three times during study the student will be disengaged from the Faculty
6	**Plagiarism**:

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	Plagiarism is the attending of the student the exam of a course instead of other student. If the examination committee proved a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Affair Council of the university.
7	**Other policies:** - The mobile phone is not allowable to be used during class lecture. It must be switched off, otherwise the student will be ordered to leave the lecture room. - The mobile phone is not allowed to be taken during the examination time. - Lecture notes and assignments may be given directly to students using soft or hard copy.

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