



14. Course Specification of Engineering Drawing

I. Course Identification and General Information:						
1.	Course Title:	Engineering Drawing .				
2.	Course Code & Number:	BR003.				
3.	Credit hours:	C.H				TOTAL CR. HRS.
		Th.	Seminar/Tu.	Pr	Tr.	
		1	-	4	-	
4.	Study level/ semester at which this course is offered:	First Year -First Semester.				
5.	Pre –requisite (if any):	None.				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered:	B.Sc. Mechanical Engineering.				
8.	Language of teaching the course:	English Language.				
9.	Location of teaching the course:	Faculty of Engineering.				
10.	Prepared By:	Asst. Prof. Dr. Abdulsalam Almakhlafy.				
11.	Date of Approval:					

II. Course Description:
<p>Engineering drawing is a beginning drawing course. Students are introduced to fundamental knowledge and skills such as line work, lettering, scale use, and sketching, multi-view drawings, sectional views, with the basics of manual drawing techniques and the use of computer aided drafting equipment (CAD). This course is designed to provide the students with the rules of engineering drawing. The students will learn the techniques of graphical communication and standard practices of technical drawing.</p>

	III. Alignments of the Course Intended learning outcomes (CILOs) of the course	Referenced PILOs
a1	Depict knowledge of technical drawings professions and means of communications to others.	A1
a2	Describe the shapes, angles and lines and others which is essential for mechanical engineer.	A2
a3	Establish the main ideas of using dimensions for engineering drawing.	A4

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b1	Analyze the principle of projection and sectioning.	B1
b2	Construct three dimensions objects on the paper and draw the pectoral drawings.	B2
c1	Choose the proper scale for drawing.	C1
c2	Employ projection and section views in the drawing.	C3
d2	Cooperate effectively with engineers in drawing.	D5

(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- Depict knowledge of technical drawings professions and means of communications to others.	<ul style="list-style-type: none"> Interactive lectures, Interactive class discussions, Class work Exercises and Homework, 	<ul style="list-style-type: none"> Major Exams Home works and assignments,
a2- Describe the shapes, angles and lines and others which is essential for mechanical engineer.	<ul style="list-style-type: none"> Interactive lectures, Interactive class discussions, Class work(drawing exercises0 Exercises and Homework, 	<ul style="list-style-type: none"> Major Exams Homework and assignments,
a3- Establish the main ideas of using dimensions for engineering drawing.	<ul style="list-style-type: none"> Interactive lectures, Interactive class discussions, Class work(drawing exercises0 Exercises and Homework, 	<ul style="list-style-type: none"> Major Exams Homework and assignments,

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

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b1- Analyze the principle of projection and sectioning.	<ul style="list-style-type: none"> Lectures & Class activity 	<ul style="list-style-type: none"> Homework Major Exams Class work Exercises Class attendance & participation
b2- Construct three dimensions objects on the paper and draw the pectoral drawings.	<ul style="list-style-type: none"> Class work (drawing exercises) Solving engineering projection sheets 	

© 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- Choose the proper scale for drawing.	<ul style="list-style-type: none"> Lectures & Class activity Class work (drawing exercises) Solving engineering projection sheets 	<ul style="list-style-type: none"> Homework Major Exams Class work Exercises Class attendance & participation
c2- Employ projection and section views in the drawing		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d2- Cooperate effectively with engineers in drawing.	<ul style="list-style-type: none"> Lectures Class activity Semester work 	<ul style="list-style-type: none"> Class work Exercises Written exams

IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact hours
1.	Introduction to Engineering Drawing And Computer-	a1	<ul style="list-style-type: none"> Drawing tools and its uses Drawing sheets standards Alphabet of lines. Basic Dimensions and lettering 	1	1

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	Aided Drafting (CAD)				
2.	Geometrical Constructions (using manual tools and CAD))	a1, a2	<ul style="list-style-type: none"> • Lines • Bisect a given line and angle • Draw different fillet arcs • Tangents to circles • Reverse Curve • Conic Sections 	2	2
3.	Theory of Projection (using manual tools and CAD)	a3, b1	<ul style="list-style-type: none"> • Conception of Projection • Orthographic Projection • Central Projection • Oblique projection • First and Third Angle Projection • Projection of Point, Straight Line and Plane • Projection of Three Dimensions Objects • Standard dimensions of drawing. • General data of drawing sheet. (Drawings distribution on the drawing sheet and tabling) 	3	3
4.	Projection of Three Dimension Objects (using manual tools and CAD)	b1,b2,c1,c2	<ul style="list-style-type: none"> • Construction of isometric view. • Construction of orthogonal isometric • Construction of isometric from projections • Construction of isometric from two projections 	1	1
5.	Midterm Exam	a1,a2,a3,b1,b2	<ul style="list-style-type: none"> • The First 4 Chapters. 	1	1

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6.	Projection of Three Dimension Objects (using manual tools and CAD)	b1,b2,c1,c2	<ul style="list-style-type: none"> • Construction of isometric view. • Construction of orthogonal isometric • Construction of isometric from projections • Construction of isometric from two projections 	1	1
7.	Drawing the missing view using two given views.	b1,c2,d2	<ul style="list-style-type: none"> • Exercises for drawing the third projection from two given projections 	3	3
8.	Sections	a2,c2	<ul style="list-style-type: none"> • Types of sections. • Full section • Half section • Interposed or revolved sections • Partial section • Aligned Section • Hatching Lines • Non-Sectioned Parts. 	3	3
9.	Final Test	a1,a2,a3,b1,b2, c1,c2	<ul style="list-style-type: none"> • All the Chapters. 	1	1
Number of Weeks /and Units Per Semester				16	16

B - Practical Aspect:				
Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	<ul style="list-style-type: none"> ▪ Train to use drawing tools, CAD. ▪ Train drawing types of lines. 	1	4	a1,a2
2.	<ul style="list-style-type: none"> ▪ Drawing geometrical constructions (manual tools and CAD) 	2	8	a3,b1

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3.	<ul style="list-style-type: none"> Drawing projection of simple parts (manual tools and CAD) 	3	12	b1,b2,c1
4.	<ul style="list-style-type: none"> Drawing isometric simple parts Draw isometric from given views Draw isometric from semi complex parts 	3	12	b2,c2
5.	<ul style="list-style-type: none"> Drawing the missing view from two given views. 	3	12	c1,d2
6.	<ul style="list-style-type: none"> Many exercises for drawing different types of sections. 	2	8	a1,d2
Number of Weeks /and Units Per Semester		14	56	

V. Teaching strategies of the course:

- Interactive lectures
- Interactive class discussions
- Class work (drawing exercises)
- Exercises and **Homework**
- Solving engineering projection sheets
- Class activity
- Semester work

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Assignment in practice (1,2,3)	a1,a3	2 th , 3 rd	7
2.	Assignment in practice (4,5,6)	a2, b1	4 th , 5 th , 6 th	7
3.	Assignment in practice 7, and Homework	a2,b2,	8 th , 9 th , 10 th , 11 th ,	10
5.	Assignment in practice (8,9,10)	b1, b2,c1,c2	12 th , 13 th	8
6.	Assignment in practice (11,12)	a2,b1,d1	14 th	7
Total				39

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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.	Practice assignment H.W(1-13).	2-14	40	26 %	a1, a2, a3, b1, b2, c1, c2
2.	Quiz.	2-14	5	4 %	a1, a2, a3, b1, b2, c1, c2
3.	Mid Term Exam.	8	30	20 %	a1, a2, a3, b1, b2, c1, c2
4.	Final Exam.	16	75	50 %	a1, a2, a3, b1, b2, c1, c2
Total			150 %	100 %	

VIII. Learning Resources:	
<ul style="list-style-type: none"> Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher). 	
1- Required Textbook(s) (maximum two).	
	1. Thomas, E.F., 2004, “Fundamentals of Engineering Drawing”, McGraw-Hill. 2. Thomas, E.F. and Vierck, C.J., 2001, “Engineering Drawing and Graphic Technology”, McGraw-Hill.
2- Essential References.	
	1- Hart, K.R., 2003, “Engineering Drawing”, The English Universities Press Ltd. 2- Bertoline–Wiebe, 2006, “Engineering Graphics” McGraw–Hill Primis. 3- ENGINEERING GRAPHICS FOR First Year Student Specialized Scientific Programs (SSP) Faculty of Engineering Alexandria University, Prepared By Assoc. Prof. / Raafat El sayed Shaker Ismail.
3- Electronic Materials and Web Sites etc.	
	1. http://www.ces.clemson.edu 2. http://www.prenhall.com/Giesecke 3. http://www.osu.okmulgee.edu

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IX. Course Policies:	
1.	<p>Class Attendance:</p> <p>-A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring an approved statement from university Clinic</p>
2.	<p>Tardy:</p> <p>- For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.</p>
3.	<p>Exam Attendance/Punctuality:</p> <p>- A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.</p>
4.	<p>Assignments & Projects:</p> <p>- The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.</p>
5.	<p>Cheating:</p> <p>- For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.</p>
6.	<p>Plagiarism:</p> <p>Plagiarism is the attending of a student the exam of a course instead of another 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 Council Affair of the university.</p>
7.	<p>Other policies:</p> <ul style="list-style-type: none"> - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. <p>Lecture notes and assignments my given directly to students using soft or hard copy</p>

Reviewed By	<p><u>Vice Dean for Academic Affairs and Post Graduate Studies: Asst. Prof. Dr. Tarek A. Barakat</u></p> <p><u>President of Quality Assurance Unit: Assoc. Prof. Dr. Mohammed Algorafi</u></p> <p><u>Name of Reviewer from the Department: Assoc. Prof. Dr. Riyad Muharam</u></p>
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14. Course Plan of Engineering Drawing

I. Information about Faculty Member Responsible for the Course:						
Name of Faculty Member	Asst. Prof. Dr. Abdulsalam Almakhlafy.	Office Hours				
Location & Telephone No.		SAT	SUN	MON	TUE	WED
E-mail						

II. Course Identification and General Information:						
1-	Course Title:	Engineering Drawing.				
2-	Course Number & Code:	(BR003).				
3-	Credit hours:	C.H				Total Cr. Hrs.
		Th.	Seminar/Tu.	Pr	Tr.	
		1	-	4	-	3
4-	Study level/year at which this course is offered:	First Year –First Semester.				
5-	Pre –requisite (if any):	None.				
6-	Co –requisite (if any):	None.				
7-	Program (s) in which the course is offered	B.Sc. Mechanical Engineering.				
8-	Language of teaching the course:	English Language.				
9-	System of Study:	Semesters.				
10-	Mode of delivery:	Lectures and Practice.				
11-	Location of teaching the course:	Faculty of Engineering.				

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III. Course Description:

Engineering drawing is a beginning drawing course. Students are introduced to fundamental knowledge and skills such as line work, lettering, scale use, and sketching, multi-view drawings, sectional views, with the basics of manual drawing techniques and the use of computer aided drafting equipment (CAD). This course is design to provide the students with the rules of engineering drawing. The student will learn the techniques of graphical communication and standard practices of technical drawing.

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

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

1.	Depict knowledge of technical drawings professions and means of communications to others.
2.	Describe the shapes, angles and lines and others which is essential for mechanical engineer.
3.	Establish the main ideas of using dimensions for engineering drawing.
4.	Analyze the principle of projection and sectioning.
5.	Construct three dimensions objects on the paper and draw the pectoral drawings.
6.	Choose the proper scale for drawing.
7.	Employ projection and section views in the drawing.
8.	Cooperate effectively with engineers in drawing.

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:				
Order	Topics List	Sub Topics	Week Due	Contact Hours
1.	Introduction to Engineering Drawing And Computer-Aided Drafting (CAD)	<ul style="list-style-type: none"> Drawing tools and its uses Drawing sheets standards Alphabet of lines. Basic Dimensions and lettering 	1 st	1
2.	Geometrical Constructions	<ul style="list-style-type: none"> Lines Bisect a given line and angle 	2 nd , 3 rd	2

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	(using manual tools and CAD))	<ul style="list-style-type: none"> • Draw different fillet arcs • Tangents to circles • Reverse Curve • Conic Sections 		
3.	Theory of Projection (using manual tools and CAD)	<ul style="list-style-type: none"> • Conception of Projection • Orthographic Projection • Central Projection • Oblique projection • First and Third Angle Projection • Projection of Point, Straight Line and Plane • Projection of Three Dimensions Objects • Standard dimensions of drawing. • General data of drawing sheet. (Drawings distribution on the drawing sheet and tabling) 	4 th , 5 th , 6 th	3
4.	Projection of Three Dimension Objects (using manual tools and CAD)	<ul style="list-style-type: none"> • Construction of isometric view. • Construction of orthogonal isometric • Construction of isometric from projections • Construction of isometric from two projections 	7 th	1
5.	Midterm Exam	<ul style="list-style-type: none"> • The First 4 Chapters. 	8 th	1
6.	Projection of Three Dimension Objects (using manual tools and CAD)	<ul style="list-style-type: none"> • Construction of isometric view. • Construction of orthogonal isometric • Construction of isometric from projections • Construction of isometric from two projections 	9 th	1
7.	Drawing the missing view using two given views.	<ul style="list-style-type: none"> • Exercises for drawing the third projection from two given projections 	10 th , 12 th	2

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8.	Sections	<ul style="list-style-type: none"> • Types of sections. • Full section • Half section • Interposed or revolved sections • Partial section • Aligned Section • Hatching Lines • Non-Sectioned Parts. 	13 th , 15 th	2
9.	Final Test	<ul style="list-style-type: none"> • All the Chapters. 	16 th	1
Number of Weeks /and Units Per Semester			16	16

B – Practical Aspect:			
Order	Topics List	Week Due	Contact Hours
1.	<ul style="list-style-type: none"> ▪ Train to use drawing tools, CAD. ▪ Train drawing types of lines. 	1 st	4
2.	<ul style="list-style-type: none"> ▪ Drawing geometrical constructions (manual tools and CAD) 	2 nd , 3 rd	8
3.	<ul style="list-style-type: none"> ▪ Drawing projection of simple parts (manual tools and CAD) 	4 th , 5 th , 6 th	12
4.	<ul style="list-style-type: none"> ▪ Drawing isometric simple parts ▪ Draw isometric from given views ▪ Draw isometric from semi complex parts 	7 th , 8 th , 9 th	12
5.	<ul style="list-style-type: none"> ▪ Drawing the missing view from two given views. 	10 th , 10 th , 12 th	12
6.	<ul style="list-style-type: none"> ▪ Many exercises for drawing different types of sections. 	13 th , 14 th	8
Number of Weeks /and Units Per Semester		14	56

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VI. Teaching strategies of the course:

- Interactive lectures
- Interactive class discussions
- Class work (drawing exercises)
- Exercises and **Homework**
- Solving engineering projection sheets
- Class activity
- Semester work

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1.	Assignment in practice (1,2,3)	a1,a3	2 th , 3 rd	7
2.	Assignment in practice 4,5,6	a2, b1	4 th , 5 th , 6 th	7
3.	Assignment in practice 7, and Homework	a2,b2,	8 th , 9 th , 10 th , 11 th ,	10
5.	Assignment in practice 8,9,10	b1, b2,,c1,c2	12 th , 13 th	8
6.	Assignment in practice 11,12	a2,b1,d1	14 th	7
	Total			39

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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.	Practice assignment H.W(1-13).	2-14	40	26%	a1, a2, a3, b1, b2, c1, c2
2.	Quiz.	2-14	5	4%	a1, a2, a3, b1, b2, c1, c2
3.	Mid-Term Exam.	8	30	20%	a1, a2, a3, b1, b2, c1, c2
4.	Final Exam.	16	75	50%	a1, a2, a3, b1, b2, c1, c2
	Total		150%	100%	

IX. Learning Resources:	
<ul style="list-style-type: none"> Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher). 	
1- Required Textbook(s) (maximum two).	
	<ol style="list-style-type: none"> 1. Thomas, E.F., 2004, “Fundamentals of Engineering Drawing”, McGraw-Hill. 2. Thomas, E.F. and Vierck, C.J., 2001, “Engineering Drawing and Graphic Technology”, McGraw-Hill.
2- Essential References.	
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3- Electronic Materials and Web Sites etc.	
	<ol style="list-style-type: none"> 1- http://www.ces.clemson.edu 2- http://www.prenhall.com/Giesecke 3- http://www.osu.okmulgee.edu

X. Course Policies:	
1.	Class Attendance:

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2.	Tardy: - For late in attending the class, the student will be initially notified. If he repeated lateness in attending class he will be considered as absent.
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5.	Cheating: - For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6.	Plagiarism: Plagiarism is the attending of a student the exam of a course instead of another 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 Council Affair of the university.
7.	Other policies: - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. Lecture notes and assignments my given directly to students using soft or hard copy

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