



## 12.Course Specification of Engineering Drawing

I. Course Identification and General Information:						
.1	Course Title:	Engineering Drawing.				
.2	Course Code & Number:	BR005.				
.3	Credit hours:	Contact hours				TOTAL CR.HR
		Th.	Seminar	Pr.	Tu.	
		2	-	2	2	4
.4	Study level/ semester at which this course is offered:	First Year - Second Semester.				
.5	Pre –requisite (if any):	None.				
.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:	Asst. Prof. Dr. Hamoud A. Al-Nahari. Asst. Prof. Dr. Abdullah A. Dhaiban.				
11.	Date of Approval:					

II.Course Description:
This course covers two sections, manual drawing and computer-aided drafting (CAD), such as SolidWorks. It is an introductory engineering drawing for problem solving and technical communication, including geometric construction, / methods of projection, free hand sketching, dimensioning and orthogonal projection, missing views, pictorial projection (isometric), sectional views, electrical circuits symbols, and introduction to assembly drawing. The manual drawing of this course will be taken in parallel with computer-aided drafting (CAD).

III.Course Intended learning outcomes (CILOs) of the course	Referenced PILOs
a1. Characterize the fundamental of engineering drawing and graphics.	A1
a2. Describe objects with free hand sketching, using CAD's software's, and standard engineering drawings, i.e. orthographic projections and isometric views of object (2D & 3D).	A2

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Department  
Assoc. Prof.  
Dr. Abdul-  
Malik Momin

Quality Assurance  
Unit  
Assoc. Prof. Dr.  
Mohammad  
Algorafi

Dean of the  
Faculty  
Prof. Dr.  
Mohammed AL-  
Bukhaiti

Academic Development  
Center & Quality Assurance  
Assoc. Prof. Dr. Huda Al-  
Emad

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Mohammed Abbas



<b>b1.</b>	Analyze appropriate solutions for engineering problems based on analytical thinking.	B1
<b>b2.</b>	Explore skills and create design ideas expressed in visualizing the various views of mechanical parts using computer models.	B2
<b>b3.</b>	Integrate main parameters to support Mechatronics product.	B5
<b>c1.</b>	Apply different techniques, skills, and modern engineering tools necessary for engineering practice.	C2
<b>c2.</b>	Perform standard specifications while designing.	C5
<b>d1.</b>	Cooperate in work effectively and share learned knowledge.	D1
<b>d2.</b>	Justify the results effectively through different forms.	D6

**(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:**

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
<b>a1.</b> Characterize the fundamental of engineering drawing and graphics.	<ul style="list-style-type: none"> <li>Lectures.</li> <li>Discussions &amp;</li> <li>Class Activity.</li> <li>Class Work.</li> </ul>	<ul style="list-style-type: none"> <li>Homework.</li> <li>Quizzes.</li> <li>Problem Sets (Exercises).</li> </ul>
<b>a2.</b> Describe objects with free hand sketching, using CAD's software, and standard engineering drawings, i.e. orthographic projections and isometric views of object (2D & 3D).		

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

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
<b>b1.</b> Analyze appropriate solutions for engineering problems based on analytical thinking.	<ul style="list-style-type: none"> <li>Lectures &amp; Class Activity.</li> <li>Class Drawing Exercises.</li> <li>Solving Engineering Projection Sheets.</li> </ul>	<ul style="list-style-type: none"> <li>Homework.</li> <li>Quizzes.</li> <li>Class Participation.</li> </ul>
design <b>b2.</b> Explore skills and create ideas expressed in visualizing the various views of mechanical parts using computer models.		
<b>b3</b> Integrate main parameters to support product. Mechatronics		

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

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Assoc. Prof.  
Dr. Abdul-Malik Momin

Quality Assurance Unit  
Assoc. Prof. Dr. Mohammad Algorafi

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Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
<b>c1.</b> Apply different techniques, skills, and modern engineering tools necessary for engineering practice.	<ul style="list-style-type: none"> <li>Lectures &amp; Class Activity.</li> <li>Class Drawing Exercises.</li> <li>Solving Engineering Projection sheets.</li> </ul>	<ul style="list-style-type: none"> <li>Homework.</li> <li>Quizzes.</li> <li>Class Participation.</li> </ul>
<b>c2.</b> Perform standard specifications while designing.		

<b>(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
<b>d1.</b> Cooperate in work effectively and share learned knowledge.	<ul style="list-style-type: none"> <li>Lectures.</li> <li>Class Activity.</li> <li>Semester Work.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions.</li> <li>Class Work.</li> </ul>
<b>d2.</b> Justify the results effectively through different forms.		

#### 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-Aided Drafting (CAD).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	<ul style="list-style-type: none"> <li>Engineering drawing concept.</li> <li>Importance of engineering drawings.</li> <li>Computers in design and drafting.</li> <li>Drawing sets and their uses.</li> <li>Units and scale.</li> <li>Standard sheet sizes.</li> <li>Kinds of lines and lettering.</li> </ul>	1	2
2.	Geometrical Constructions, Computer-Aided Drafting (CAD).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	<ul style="list-style-type: none"> <li>Computer-aided design and drafting.</li> <li>Geometrical constructions.</li> <li>Tangency.</li> </ul>	2	4
3.	Projection Methods and	a1, a2, b1,b2, b3,	<ul style="list-style-type: none"> <li>Projection methods.</li> <li>Perpendicular (orthogonal) projection.</li> </ul>	2	4

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Assoc. Prof.  
Dr. Abdul-Malik Momin

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Mohammed AL-Bukhaiti

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	CAD Applications.	c1, c2, d1,d2.	- First and third angle projections. - Orthogonal projection of a point, Line & plane. - Free hand sketching.		
4.	Orthogonal Projection and 3D Modeling.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	- Choice of front view (elevation). - First angle projection of Isometric on three planes. - Construction orthographic projection of models from their pictorial views.	1	2
5.	Dimensioning and Parametric Modeling.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	- Principle of dimensioning. - Apply dimensioning on orthogonal projection.	1	2
6.	Mid-Term Exam.	a1, a2, b1,b2, b3, c1, c2.	- The first 5 chapters.	1	2
7.	Missing Views.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	- Two views are known, one view is missing (to find third missing view).	1	2
8.	Pictorial Projection.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	- Kinds of pictorial projection (Isometric& oblique ).	1	2
9.	Sectioning Views.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	- Importance of sectioning. - Cutting plane lines. - Types of sections views. - Rules for hatching.	2	4
10.	Electrical Circuits, Electrical Device Symbol and Assembly Drawing.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	- Electrical device symbol. - Electrical circuits. - Assembly drawing concept. - Types of assembly drawing.	1	2
11.	Assembly Drawing.	a1, a2, b1,b2, b3,	- Steps of creating assembly drawing.	2	4

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Dr. Abdul-Malik Momin

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Mohammad Algorafi

Dean of the Faculty  
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Mohammed AL-Bukhaiti

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		c1, c2, d1,d2.	- Section of assembly drawing.		
12.	Final Exam	a1, a2, b1,b2, b3, c1, c2.	- All the chapters.	1	2
<b>Number of Weeks /and Units Per Semester</b>				<b>16</b>	<b>32</b>

### B – Tutorial Aspect:

Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	Introduction to Engineering Drawing and Computer-Aided Drafting (CAD).	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
2.	Geometrical Constructions, Computer-Aided Drafting (CAD).	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
3.	Projection Methods and CAD Applications.	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
4.	Orthogonal Projection and 3D Modeling.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
5.	Dimensioning and Parametric Modeling.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
6.	Missing Views.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
7.	Pictorial Projection.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
8.	Sectioning Views.	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
9.	Electrical Circuits, Electrical Device Symbol and Assembly Drawing.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
10.	Assembly Drawing.	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
<b>Number of Weeks /and Units Per Semester:</b>		<b>14</b>	<b>28</b>	

### B - Practical Aspect: (CAD lab)

Order	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes
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Head of the Department  
Assoc. Prof.  
Dr. Abdul-Malik Momin

Quality Assurance Unit  
Assoc. Prof. Dr.  
Mohammad Algorafi

Dean of the Faculty  
Prof. Dr.  
Mohammed AL-Bukhaiti

Academic Development Center & Quality Assurance  
Assoc. Prof. Dr. Huda Al-Emad

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1.	Introduction to Computer Aided Drafting Software. - CAD hardware and software requirements. - Using the main menu and screen menus. - Setting up a drawing: units/limits. - Save, quit and end commands.	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
2.	Use of CAD to Draw and Modify 2D Drawing - Sketch entities: arcs and circles, polygons, ellipse, spline, and text.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
3.	Sketch and Editing (2D Drawing). - Sketch tools. - Editing tools. - Apply on sketching geometric operations and drawing.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
4.	Sketch Tools - Blocks. - Relations. - Dimensioning. - Parametric modeling.	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
5.	3D Modeling Tools	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
6.	3D Editing Tools.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
7.	Mid-Term Exam.	1	2	a1, a2, b1,b2, b3, c1, c2.
8.	Advanced 3D Modeling and Editing.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
9.	Generating 2d Drawing from 3D Part - Generating 2d orthogonal views. - Generating isometric and auxiliary views. - Generating section views.	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.

Head of the Department  
Assoc. Prof.  
Dr. Abdul-Malik Momin

Quality Assurance Unit  
Assoc. Prof. Dr.  
Mohammad Algorafi

Dean of the Faculty  
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Mohammed AL-Bukhaiti

Academic Development Center & Quality Assurance  
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10.	<p style="text-align: center;">Assembly Modeling Tools</p> <ul style="list-style-type: none"> <li>- Approaches of assembly drawing.</li> <li>- Mates tools.</li> <li>- Clearance.</li> <li>- Generating various types of assembly drawing.</li> <li>- editing assembly drawing</li> <li>- analyzing the motion of assembled parts.</li> <li>- Plotting.</li> </ul>	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
11.	Final exam or (discussion CAD project discussion)	2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
<b>Number of Weeks /and Units Per Semester:</b>		<b>16</b>	<b>32</b>	

### V. Teaching strategies of the course:

Lectures.  
Discussions & Class Activity.  
Class Work Exercises.  
Lab. Drawing Exercises.  
Solving Engineering Projection Sheets.

### VI. Assignments:

No.	Assignment	Aligned CILOs(symbols)	Week Due	Mark
1.	Weekly Drawing (Class Work).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	2-14	8
2.	Weekly Drawing (Home Work).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	3-12	7
3.	Weekly Drawing (CAD. Lab.).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	2-14	10
4.	CAD Project.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	13	5
<b>Total</b>				<b>30</b>

### 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.	Weekly Drawing Class work.	2-14	16	8%	a1, a2, b1,b2, b3, c1, c2, d1,d2.

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Assoc. Prof.  
Dr. Abdul-Malik Momin

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Assoc. Prof. Dr.  
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2.	Weekly Drawing Homework	2-14	14	7%	a1, a2, b1,b2, b3, c1, c2.
3.	Mid-Term Exam.	8	20	10%	a1, a2, b1,b2, b3, c1, c2.
4.	CAD Lab. Exercises.	3-13	14	7%	a1, a2, b1,b2, b3, c1, c2.
5.	Mid-Term Exam (CAD Lab).	8	16	8%	a1, a2, b1,b2, b3, c1, c2.
6.	Final Practical Exam or ( Discussion CAD Project).	13	20	10%	a1, a2, b1,b2, b3, c1, c2.
7.	Final Exam.	16	100	50%	a1, a2, b1,b2, b3, c1, c2.
<b>Total</b>			<b>200</b>		

## VIII. Learning Resources:

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

- 1- M. B. Shah and B. C. Rana, 2007-. "Engineering Drawing". Person Education.
- 2- Bertoline–Wiebe, 2006 "Engineering Graphics, Fundamentals of Graphics Communication" Fifth Edition- McGraw Hill.
- 3- David A. Madsen, David P. Madsen, 2012- "Engineering Drawing and Design", Fifth Edition, Delmar Engage learning, 2012.
- 4- William Howard, and Joe Musto, 2017-"Introduction to Solid Modeling Using Solid Works", McGraw Hill.

### 2- Essential References.

1. محي الدين قشلان " الرسم الميكانيكي و الكهربائي دار الراءب الجامعية – لبنان
2. Gary Robert, and Eric N. Webe, 2006, "Fundamentals of Graphics Communications", McGraw Hill.
3. Thomas, E.F., 2004, "Fundamentals of Engineering Drawing", McGraw-Hill.
4. Thomas, E.F. and Vierck, C.J., 2001, "Engineering Drawing and Graphic Technology", McGraw-Hill.

### 3- Electronic Materials and Web Sites etc.

- 1- <http://www.technologystudent.com./designpro/drawdex.htm>
- 2- <http://www.ces.clemson.edu>
- 3- <http://www.prenhall.com/Giesecke>
- 4- <http://www.osu.okmulgee.edu2>

Head of the Department  
Assoc. Prof.  
Dr. Abdul-Malik Momin

Quality Assurance Unit  
Assoc. Prof. Dr.  
Mohammad Algorafi

Dean of the Faculty  
Prof. Dr.  
Mohammed AL-Bukhaiti

Academic Development Center & Quality Assurance  
Assoc. Prof. Dr. Huda Al-Emad

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IX.Course Policies:	
1.	Class Attendance: - The students should have more than 75% of attendance according to rules and regulations of the faculty.
2.	Tardy: - The students should respect the timing of attending the lectures. They should attend within 15 minutes from starting of the lecture.
3.	Exam Attendance/Punctuality: - 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.	Assignments & Projects: - The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5.	Cheating: - 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.	Plagiarism: - If one student attends the exam on another behalf; he will be dismissed from the faculty according to the policy, rules and regulations of the university.
7.	Other Policies: - All the teaching materials should be kept out the examination hall and mobile phones are not allowed. - Mutual respect should be maintained between the student and his teacher and also among students. Failing in keeping this respect is subject to the policy, rules and regulations of the university.

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. Head of Mechatronics Engineering Department: Assoc. Prof. Dr. Abdul-Malik Momin. Assoc. Prof. Dr. Riyadh Muharam.
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Head of the Department  
Assoc. Prof. Dr. Abdul-Malik Momin

Quality Assurance Unit  
Assoc. Prof. Dr. Mohammad Algorafi

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Academic Development Center & Quality Assurance  
Assoc. Prof. Dr. Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



## Course Plan of Engineering Drawing

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member	Asst. Prof. Dr. Hamoud A. Al-Nahari. Asst. Prof. Dr. Abdullah Dhaiban.		Office Hours					
	Location & Telephone No.	774581887	SAT	SUN	MON	TUE	WED	THU
E-mail	h.nehari@gmail.com Adaiban2@google.com		2				2	

II. Course Identification and General Information:						
1.	Course Title:	Engineering Drawing.				
2.	Course Number & Code:	BR005.				
3.	Credit hours:	Contact hours				TOTAL CR.HR
		Th.	Seminar	Pr.	Tu.	
		2	--	2	2	4
4.	Study level/year at which this course is offered:	First year -Second Semester.				
5.	Pre –requisite (if any):	None.				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered	Mechatronics Engineering Department.				
8.	Language of teaching the course:	English Language.				
9.	System of Study:	Semesters.				
10.	Mode of delivery:	Lectures, Tutorials and Lab.				
11.	Location of teaching the course:	Mechatronics Engineering Department.				

### III. Course Description:

This course covers two sections, manual drawing and computer-aided drafting (CAD), such as SolidWorks. It is an introductory engineering drawing for problem solving and technical communication, including geometric construction, / methods of projection, free hand sketching, dimensioning and orthogonal projection, missing views, pictorial projection (isometric), sectional views, electrical circuits symbols, and introduction to assembly drawing. The manual drawing of this course will be taken in parallel with computer-aided drafting (CAD).

Head of the  
Department  
Assoc. Prof.  
Dr. Abdul-  
Malik Momin

Quality Assurance  
Unit  
Assoc. Prof. Dr.  
Mohammad  
Algorafi

Dean of the  
Faculty  
Prof. Dr.  
Mohammed AL-  
Bukhaiti

Academic Development  
Center & Quality Assurance  
Assoc. Prof. Dr. Huda Al-  
Emad

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Mohammed Abbas



IV. Course Intended learning outcomes (CILOs) of the course		Reference PILOs
a1.	Characterize the fundamental of engineering drawing and graphics.	A1
a2.	Describe objects with free hand sketching, using CAD's software's, and standard engineering drawings, i.e. orthographic projections and isometric views of object (2D & 3D).	A2
b1.	Analyze appropriate solutions for engineering problems based on analytical thinking.	B1
b2.	Explore skills and create design ideas expressed in visualizing the various views of mechanical parts using computer models.	B2
b3.	Integrate main parameters to support Mechatronics product.	B5
c1.	Apply different techniques, skills, and modern engineering tools necessary for engineering practice.	C2
c2.	Perform standard specifications while designing.	C5
d1.	Cooperate in work effectively and share learned knowledge.	D1
d2.	Justify the results effectively through different forms.	D6

V. Course Content:				
A – Theoretical Aspect:				
Order	Units/Topics List	Sub- Topics List	Number of Weeks	Contact Hours
1.	Introduction to Engineering Drawing and Computer-Aided Drafting (CAD).	<ul style="list-style-type: none"> <li>- Engineering drawing concept.</li> <li>- Importance of engineering drawings.</li> <li>- Computers in design and drafting.</li> <li>- Drawing sets and their uses.</li> <li>- Units and scale.</li> <li>- Standard sheet sizes.</li> <li>- Kinds of lines and lettering.</li> </ul>	1	2
2.	Geometrical Constructions, Computer-Aided Drafting (CAD).	<ul style="list-style-type: none"> <li>- Computer-aided design and drafting.</li> <li>- Geometrical constructions.</li> <li>- Tangency.</li> </ul>	2,3	4
3.	Projection Methods and CAD Applications.	<ul style="list-style-type: none"> <li>- Projection methods.</li> <li>- Perpendicular (orthogonal) projection.</li> <li>- First and third angle projections.</li> </ul>	4,5	4

Head of the Department  
Assoc. Prof.  
Dr. Abdul-Malik Momin

Quality Assurance Unit  
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Mohammad Algorafi

Dean of the Faculty  
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Mohammed AL-Bukhaiti

Academic Development Center & Quality Assurance  
Assoc. Prof. Dr. Huda Al-Emad

Rector of Sana'a University  
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		- Orthogonal projection of a point, Line & plane. - Free hand sketching.		
4.	Orthogonal Projection and 3D Modeling.	- Choice of front view (elevation). - First angle projection of Isometric on three planes. - Construction orthographic projection of models from their pictorial views.	6	2
5.	Dimensioning and Parametric Modeling.	- Principle of dimensioning. - Apply dimensioning on orthogonal projection.	7	2
6.	Mid-Term Exam.	- The first 5 chapters.	8	2
7.	Missing Views.	- Two views are known, one view is missing (to find third missing view).	9	2
8.	Pictorial Projection.	- Kinds of pictorial projection (Isometric & oblique).	10	2
9.	Sectioning Views.	- Importance of sectioning. - Cutting plane lines. - Types of sections views. - Rules for hatching.	11,12	4
10.	Electrical Circuits, Electrical Device Symbol and Assembly Drawing.	- Electrical device symbol. - Electrical circuits. - Assembly drawing concept. - Types of assembly drawing.	13	2
11.	Assembly Drawing.	- Steps of creating assembly drawing. - Section of assembly drawing.	14,15	4
12.	Final Exam	- All the chapters.	16	2
<b>Number of Weeks /and Units Per Semester</b>			<b>16</b>	<b>32</b>
<b>B – Tutorial Aspect:</b>				
Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1.	Introduction to Engineering Drawing and Computer-Aided Drafting (CAD).	1	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.

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Dr. Abdul-Malik Momin

Quality Assurance Unit  
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Mohammad Algorafi

Dean of the Faculty  
Prof. Dr.  
Mohammed AL-Bukhaiti

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Assoc. Prof. Dr. Huda Al-Emad

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2.	Geometrical Constructions, Computer-Aided Drafting (CAD).	2,3	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
3.	Projection Methods and CAD Applications.	4,5	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
4.	Orthogonal Projection and 3D Modeling.	6	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
5.	Dimensioning and Parametric Modeling.	7	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
6.	Missing Views.	8	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
7.	Pictorial Projection.	9	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
8.	Sectioning Views.	10,11	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
9.	Electrical Circuits, Electrical Device Symbol and Assembly Drawing.	12	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
10.	Assembly Drawing.	13,14	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
<b>Number of Weeks /and Units Per Semester:</b>		<b>14</b>	<b>28</b>	

<b>B - Practical Aspect: (CAD lab)</b>				
<b>Order</b>	<b>Tasks/ Experiments</b>	<b>Number of Weeks</b>	<b>Contact Hours</b>	<b>Learning Outcomes</b>
1.	Introduction to Computer Aided Drafting Software. - CAD hardware and software requirements. - Using the main menu and screen menus. - Setting up a drawing: units/limits. - Save, quit and end commands.	1,2	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
2.	Use of CAD to Draw and Modify 2D Drawing - Sketch entities: arcs and circles, polygons, ellipse, spline, and text.	3	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.

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3.	Sketch and Editing (2D Drawing). - Sketch tools. - Editing tools. - Apply on sketching geometric operations and drawing.	4	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
4.	Sketch Tools - Blocks. - Relations. - Dimensioning. - Parametric modeling.	5,6	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
5.	3D Modeling Tools	7,8	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
6.	3D Editing Tools.	9	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
7.	Mid-Term Exam.	10	2	a1, a2, b1,b2, b3, c1, c2.
8.	Advanced 3D Modeling and Editing.	11	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
9.	Generating 2d Drawing from 3D Part - Generating 2d orthogonal views. - Generating isometric and auxiliary views. - Generating section views.	12	2	a1, a2, b1,b2, b3, c1, c2, d1,d2.
10.	Assembly Modeling Tools - Approaches of assembly drawing. - Mates tools. - Clearance. - Generating various types of assembly drawing. - editing assembly drawing - analyzing the motion of assembled parts. - Plotting.	13,14	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.

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11.	Final exam or (discussion CAD project discussion)	15,16	4	a1, a2, b1,b2, b3, c1, c2, d1,d2.
<b>Number of Weeks /and Units Per Semester:</b>				
<b>VI. Teaching strategies of the course:</b>				
Lectures. Discussions & Class Activity. Class Work Exercises. Lab. Drawing Exercises. Solving Engineering Projection Sheets.				

<b>VII. Assignments:</b>				
No.	Assignment	Aligned CILOs(symbols)	Week Due	Mark
1.	Weekly Drawing (Class Work).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	2-14	8
2.	Weekly Drawing (Home Work).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	3-12	7
3.	Weekly Drawing (CAD. Lab.).	a1, a2, b1,b2, b3, c1, c2, d1,d2.	2-14	10
4.	CAD Project.	a1, a2, b1,b2, b3, c1, c2, d1,d2.	13	5
<b>Total</b>				<b>30</b>

<b>VIII. Schedule of Assessment Tasks for Students During the Semester:</b>					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	Weekly Drawing Class work.	2-14	16	8%	a1, a2, b1,b2, b3, c1, c2, d1,d2.
2.	Weekly Drawing Homework	2-14	14	7%	a1, a2, b1,b2, b3, c1, c2.
3.	Mid-Term Exam.	8	20	10%	a1, a2, b1,b2, b3, c1, c2.
4.	CAD Lab. Exercises.	3-13	14	7%	a1, a2, b1,b2, b3, c1, c2.
5.	Mid-Term Exam (CAD Lab).	8	16	8%	a1, a2, b1,b2, b3, c1, c2.
6.	Final Practical Exam or (Discussion CAD Project).	13	20	10%	a1, a2, b1,b2, b3, c1, c2.
7.	Final Exam.	16	100	50%	a1, a2, b1,b2, b3, c1, c2.

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Total		200	
<b>IX. Learning Resources:</b>			
<b>1- Required Textbook(s) ( maximum two ).</b>			
	1 M. B. Shah and B. C. Rana, 2007-. "Engineering Drawing". Person Education. 2 Bertoline–Wiebe, 2006 "Engineering Graphics, Fundamentals of Graphics Communication" Fifth Edition- McGraw Hill. 3 David A. Madsen, David P. Madsen, 2012- "Engineering Drawing and Design", Fifth Edition, Delmar Engage Learning. 4 William Howard, and Joe Musto, 2017-"Introduction to Solid Modeling Using Solid Works", McGraw Hill.		
<b>2- Essential References.</b>			
	1. محي الدين قشلان " الرسم الميكانيكي و الكهربائي دار الراءب الجامعية – لبنان 2. Gary Robert, and Eric N. Webe, 2006, "Fundamentals of Graphics Communications", McGraw Hill. 3. Thomas, E.F.,2004, "Fundamentals of Engineering Drawing", McGraw-Hill. 4. Thomas, E.F. and Vierck, C.J., 2001, "Engineering Drawing and Graphic Technology", McGraw-Hill.		
<b>3- Electronic Materials and Web Sites etc.</b>			
	1. <a href="http://www.technologystudent.com./designpro/drawdex.htm">http://www.technologystudent.com./designpro/drawdex.htm</a> 2. <a href="http://www.ces.clemson.edu">http://www.ces.clemson.edu</a> 3. <a href="http://www.prenhall.com/Giesecke">http://www.prenhall.com/Giesecke</a> 4. <a href="http://www.osu.okmulgee.edu2">http://www.osu.okmulgee.edu2</a>		
<b>X. Course Policies:</b>			
	<b>Class Attendance:</b>		
.1	The students should have more than 75% of attendance according to rules and regulations of the faculty.		
	<b>Tardy:</b>		
.2	The students should respect the timing of attending the lectures. They should attend within 15 minutes from starting of the lecture.		
	<b>Exam Attendance/Punctuality:</b>		
.3	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.		
	<b>Assignments &amp; Projects:</b>		
.4	The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.		
	<b>Cheating:</b>		
.5	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> .		
	<b>Plagiarism:</b>		
.6			

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	If one student attends the exam on another behalf; he will be dismissed from the faculty according to the policy, rules and regulations of the university.
7.	<b>Other Policies:</b> All the teaching materials should be kept out the examination hall and mobile phones are not allowed. Mutual respect should be maintained between the student and his teacher and also among students. Failing in keeping this respect is subject to the policy, rules and regulations of the university.

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