



# Bachelor Degree in Mechanical Engineering

## *MECHANICAL ENGINEERING / MECHATRONICS Track*

### 2020 Study Plan

## 1. University Graduation Requirements

To graduate with a BME, a student must satisfactorily fulfill all requirements related to credit hours, grade point average, program of study, and courses.

## 2. Degree Requirements

Type of Requirement	Credit Hours
University Requirements	30
College Requirements	37
<i>Compulsory</i> Specialization Requirements	55
<i>Elective</i> Specialization Requirements	12
<b>Total</b>	<b>134</b>

## 3. University Requirements

➤ University Requirements consist of 30 credit hours distributed as follows:

Course Number	Course Title	Credit Hours	Prerequisite
ARAB 101	Basic Academic Arabic	3	
ARAB 201	Advanced Academic Arabic	3	ARAB 101
CSC 101	Introduction to Computing for Engineers	3	
ENGL 101	Basic Academic English I	3	
ENGL 102	Basic Academic English II	3	ENGL 101
ENGL 203	Advanced Academic English I	3	ENGL 102
SOCS 101	Islamic Civilization I	3	

SOCS 202	World Civilization	3	
MATH 101	Calculus I	3	
	Free Elective	3	
<b>Total</b>		<b>30</b>	

- *Free Elective Course* (3 credit hours) could be chosen from the following list.

Course Number	Course Title	Credit Hours	Prerequisite
ASTR 150	Introduction to Astronomy	3	
CHEM 150	Chemistry & Society	3	
FREN 101	Basic French I	3	
PHED 101	Physical Education 1	3	
SOCS 201	Islamic Civilization II	3	SOCS 101

## 4. College Requirements

College Requirements consist of 37, credit hours distributed as follows:

Course Code	Title of the Course	Credit Hours	Pre-requisite
CHEM 101	General Chemistry I	3	
CHEM 101 L	General Chemistry Lab	1	CHEM 101
PHYS 101	General Physics I	3	
PHYS 102	General Physics II	3	PHYS 101
PHYS 103 L	General Physics Lab	1	PHYS 102(co)
CIVE 205	Engineering Drawing	1	CSC 101
ELEE 230	Programming for Engineers	3	CSC 101
ENGL 206	Technical Writing	3	ENGL 203
MATH 102	Calculus II	3	MATH 101
MATH 201	Calculus and Analytic Geometry III	3	MATH 102
MATH 202	Differential equations	3	MATH 102
MATH 215	Linear algebra and Numerical Techniques	3	MATH 201
STAT 230	Probability and Statistics	3	MATH 201
COEN 300	Engineering Economy	3	STAT 230
COEN 401	Engineering Ethics	1	ENGL 203
<b>Total</b>		<b>37</b>	

## 5. Program Specialization Requirements

Program specialization requirements consist of **67** credit hours: **55** compulsory credit hours, 12 elective credit hours distributed as follows.

- **Compulsory Specialization Requirements:** (55) credit hours distributed as follows:

Course Number	Course Title	Credit Hours	Pre-requisite
CIVE 210	Statics	3	PHYS 101 MATH 102(co)
MECH 201	Engineering Graphics	1	CIVE 205
MECH 210	Thermodynamics I	3	PHYS 101, CHEM 101
MECH 220	Dynamics	3	CIVE 210, MATH 201(co)
MECH 231	Strength of Materials	3	CIVE 210
MECH 232	Engineering Materials	2	CHEM 101
MECH 233	Materials Lab	1	MECH 231, MECH 232
MECH 308	Electrical Circuits and Machines	3	PHY 102
MECH 310	Thermodynamics II	3	MECH 210
MECH 320	Kinematics of Mechanical Systems	3	MECH 220
MECH 330	Mechanical Design	3	MECH 201, MECH 231(co)
MECH 341	Fluid Mechanics	3	MECH 220
MECH 342	Heat Transfer	3	MATH 202, MECH 210 MECH 310(co)
MECH 343	Heat Transfer Lab.	1	MATH 202, MECH 210 MECH 342(co)
MECH 344	Fluid Mechanics Lab	1	MECH 220 MECH 341(co)
MECH 352	Instrumentation and Measurements	2	PHY 102 MECH 308(co)
MECH 353	Instrumentation and Measurements Lab	1	PHY 102 MECH 352(co)
MECH 360	Manufacturing Processes I	3	MECH 231, MECH 232
MECH 361L	Manufacturing Processes I Lab	1	MECH 231, MECH 232 MECH 360(co)
MECH 400	Summer Internship	1	Last Summer
MECH 434	Mechanical Vibrations	3	MECH 220, MATH202
MECH 490	Dynamic Systems and Control	3	MECH 220, MECH308, MECH 352
MECH 491	Dynamic Systems and Control Lab	1	MECH 220, MECH308, MECH 352 MECH 490(co)
MECH 498	Final Year Project (1)	1	90 C. hrs., ENGL 206
MECH 499	Final Year Project (2)	3	MECH 498

<b>Total</b>	<b>55</b>	
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➤ **Elective Specialization Requirements - 12** credit hours could be chosen from the following list.

<b>Course Number</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Prerequisite</b>
<b>MECHANICAL ENGINEERING / MECHATRONICS &amp; ROBOTICS ELECTIVES</b>			
MECH 413	Introduction to Mechatronics,	3	MECH 308 MECH 320
MECH 430	Product Design and Development	3	MECH 320 ,MECH 330.
MECH 432	Mechanical CAD/CAE/CAM	3	MECH 201, MECH330, MECH360
MECH 433	Mechatronics System Design	3	MECH 413
MECH 435	Introduction to Robotics	3	MECH 308 MECH 320
MECH 460	Finite Element Methods in Mechanical Engineering	3	MECH 330, MECH 342
MECH 470	Mechanics of Composite Materials	3	MECH 232, MECH 231
MECH 481	Computer-Integration Manufacturing Systems	3	MECH 232,MECH 433
MECH 485	Industrial Robotics	3	MECH 435
MECH 492	Special Topics in Mechatronics & Robotics	3	Discretion of HOD

## Proposed Sequence of Study

### *Year I – Level 1*

Course	Title	Credits	Pre-requisites
CHEM 101L	General Chemistry Lab	1	CHEM 101
CIVE 205	Engineering Drawing	1	CSC 101
CIVE 210	Statics	3	
ENG 203	Advanced Academic English I	3	ENG 102
MATH 201	Calculus and Analytic Geometry III	3	MATH 102
MATH 202	Differential equations	3	MATH 102
MECH 232	Engineering Materials	2	CHEM 101, co CHEM 101L
PHY 103L	General Physics Lab	1	PHY 102
<b>Total</b>		<b>17</b>	

First Semester		18 Credit hours	
Course Code	Title	Credits	Pre-requisites
ARAB 101	Arabic Communication Skills	3	
CSC 101	Introduction to Computing	3	
ENGL 101	Basic Academic English I	3	
MATH 101	Calculus I	3	
PHYS 101	Physics 101	3	
SOCS 101	Islamic Civilization I	3	
<b>TOTAL</b>		<b>18</b>	

### *Year I – Level 2*

Second Semester		18 Credit hours	
Course Code	Title	Credits	Pre-requisites
ARAB 201	Advanced Academic Arabic	3	ARAB 101
CHEM 101	Chemistry I	3	
ELEE 230	Programming for Engineers	3	CSC 101
ENGL 102	Basic Academic English II	3	ENGL 101
MATH 102	Calculus II	3	MATH 101
PHYS 102	Physics II	3	PHYS 101
<b>TOTAL</b>		<b>18</b>	

**Year II - Level 3**

Third Semester		15 Credit hours	
Course Code	Title	Credits	Pre-requisites
CHEM 101 L	Chemistry Lab	1	CHEM 101
CIVE 205	Engineering Drawing	1	CSC 101
ENG 203	Advanced Academic English I	3	ENG 102
MATH 201	Calculus and Analytic Geometry III	3	MATH 102
MATH 202	Differential equations	3	MATH 102
PHY 103L	Physics Lab.	1	PHY 102
SOCS 201	Islamic Civilization I	3	
<b>TOTAL 15</b>			

**Year II - Level 4**

Fourth Semester		17 Credit hours	
Course Code	Title	Credits	Pre-requisites
MECH 220	Dynamics	3	CIVE 210
MECH 231	Strength Of Materials	3	CIVE 210, MECH 232
ENGL 206	Technical Writing	3	ENGL 203
MATH 215	Linear algebra and Numerical	3	MATH 201
MECH 210	Thermodynamics I	3	PHYS 101, CHEM 101
STAT 230	Probability and Statistics	3	MATH 201
SOCS 201	Islamic Civilization I	3	
<b>TOTAL 18</b>			

**Year III - Level 5**

Fifth Semester		16 Credit hours	
Course Code	Title	Credits	Pre-requisites
MECH 201	Mechanical Engineering Graphics	1	CIVE 205
MECH 220	Dynamics	3	CIVE 210
STAT 230	Probability and Statistics	3	MATH 201
MECH 231	Strength Of Materials	3	CIVE 210
MECH 308	Electric Circuits and Machines	3	PHY 102
MECH 310	Thermodynamics II	3	MECH 210
MECH 320	Kinematics of Mechanical Systems	3	MECH 220
<b>Total 16</b>			

**Year III - Level 6**

<b>Sixth Semester 17 Credit hours</b>			
<b>Course Code</b>	<b>Title</b>	<b>Credits</b>	<b>Pre-requisites</b>
MECH 330	Mechanical Design	3	MECH 201, MECH 231
MECH 341	Fluid Mechanics	3	MECH 220
MECH 344	Fluid Mechanics Lab	1	MECH 220
MECH 352	Instrumentation and Measurements	2	PHY 102
MECH 353	Instrumentation and Measurements Lab	1	PHY 102, Co. MECH 352
MECH 360	Manufacturing Processes I	3	MECH 232,
MECH 361L	Manufacturing Processes I Lab	1	MECH 260, MECH 231
MECH 342	Heat Transfer	3	MATH 202,
<b>Total 17</b>			

**Year II – Summer Semester**

<b>Summer Semester 1 Credit hours</b>			
<b>Course Code</b>	<b>Title</b>	<b>Credits</b>	<b>Pre-requisites</b>
MECH 400	Summer internship	1	
<b>Total 1</b>			

**Year IV III - Level 7**

Seventh Semester		17 Credit hours	
Course Code	Title	Credits	Pre-requisites
COEN 401	Engineering Ethics	1	ENGL 203
MECH 233	Materials Lab	1	MECH 230, MECH 231
MECH 343	Heat Transfer Lab	1	MATH 202, MECH 210
MECH 434	Mechanical Vibrations	3	MECH 220, MATH202
MECH 490	Dynamic Systems and Control	3	MECH 220, MECH 308
MECH 491	Dynamic Systems and Control Lab	1	MECH 220, MECH308, MECH 350
MECH 498	Final Year Project (1)	1	90 C. hrs., ENGL 206
MECH xxx	ME Elective	3	-
MECH xxx	ME Elective	3	-
<b>TOTAL</b>		<b>17</b>	

**Year IV III - Level 8**

Eighth Semester		15 Credit hours	
Code Course	Title	Credits	Pre-requisites
COEN 300	Engineering Economy	3	STAT 230
MECH 499	Final Year Project (2)	3	MECH 401
MECH xxx	ME Elective	3	-
MECH xxx	ME Elective	3	-
	University free elective	3	
<b>TOTAL</b>		<b>15</b>	