

# Mechanical Engineering (ME)

## Curriculum Outline

Mechanical engineering is concerned with the mechanisms of energy conversion and their utilization in all fields of industry, as well as in improving the quality of life for everyone. The mechanical engineering discipline has always been central to engineering. Mechanical engineers are involved in a wide range of technological activities which include: production, building-facilities, chemical processing, power generation, material science, mining and mineral extraction, transportation, aerospace engineering, and so on. For these reasons, all industries require the services of mechanical engineers.

The aim of the Mechanical Engineering Program at SIIT is to provide an effective education to prospective engineers, giving them the ability to plan, administer, and manage the latest technologies. Two main areas of study are emphasized in this program; these are: (1) general mechanical engineering, and (2) energy management.

Engineering science is taught mainly in the first and second years. Specialized mechanical engineering courses are offered to the third and fourth year students. Additionally, fundamentals on electrical engineering and industrial practice are included in the undergraduate program in mechanical engineering.

In order to serve industry competently, students have to be exposed to real equipment and processes. Two laboratory courses are required. An extended laboratory course is offered as an elective subject to senior projects, and guided by members of the teaching staff. As engineering students should obtain some experience of industry in order to learn the ways of industrial life and work, an industrial training course is offered for mechanical engineering students.

In addition, ME students can choose among three optional tracks (Senior Project Track, Foreign Exchange Track, and Extended Training Track).

- Senior Project Track is designed for ME students who wish to conduct a project under the supervision of ME faculty members.
- Foreign Exchange Track is designed for students who wish to participate in a student exchange program with foreign partner universities.
- Extended Training Track is designed for students who wish to conduct a co-operative training program with industries.

## Structure and Components

<b>1. General Basic Courses</b>	<b>30 Credits</b>
1.1 Part I	21 Credits
1.1.1 Humanities	2 Credits
1.1.2 Social Sciences	5 Credits
1.1.3 Languages	9 Credits
1.1.4 Science and Mathematics	5 Credits
1.2 Part II	9 Credits
<b>2. Core Courses</b>	<b>113 Credits</b>
2.1 Compulsory Courses	95 Credits
2.2 Compulsory Elective Courses	18 Credits
<b>3. Free Elective Courses</b>	<b>6 Credits</b>
<b>Total</b>	<b>149 Credits</b>

## Details of the Curriculum

<b>1. General Basic Courses</b>	<b>30 Credits</b>
1.1 Part I	21 Credits
1.1.1 Humanities (1 course)	2 Credits
TU110	
1.1.2 Social Sciences (2 courses)	5 Credits
TU100    TU120	
1.1.3 Languages (3 courses)	9 Credits
EL171    EL172    TU140	
1.1.4 Science and Mathematics (2 courses)	5 Credits
ITS100    TU130	
1.2 Part II	9 Credits
GTS132    GTS133    GTS202	
<b>2. Core Courses</b>	<b>113 Credits</b>
2.1 Compulsory Courses	95 Credits
2.1.1 Science and Mathematics (10 courses)	24 Credits
MAS116    MAS117    MAS210    MAS215	
SCS126    SCS138    SCS139    SCS176	
SCS183    SCS184	
2.1.2 ME Courses (27 courses)	55 Credits
MES300    MES302    MES311    MES321	
MES331    MES333    MES341    MES342	
MES350    MES351    MES352    MES371	
MES382    MES383    MES391    MES392	
MES403    MES422    MES462    MES481	
2.1.3 Non- ME Courses (7 courses)	16 Credits
ECS203    ECS204    ECS306    ECS307	
GTS302    IES301    IES361	
2.2 Compulsory Elective Courses	18 Credits
2.2.1 Students choose one of	6 Credits
three optional tracks:	
1. For Students who wish to join the Senior Project Track (2 courses)	
MES303    MES407	
2. For Students who wish to join the Foreign Exchange Track (3 courses)	
MES303    MES405    MES406	
3. For Students who wish to join the Extended Training Track (1 course)	
MES408	
2.2.2 Students choose one of two	12 Credits
optional studies:	
1. <b>Option I: General Mechanical Engineering</b>	
(4 courses)	
IES341    IES371    MES313    MES381	
2. <b>Option II: Energy Management</b>	
(4 courses)	
MES312    MES444    MES473    MES474	
<b>3. Free Elective Courses</b>	<b>6 Credits</b>
Select any courses offered by the university, except basic courses.	
XXXxxx	
<b>Total Credit Requirement</b>	<b>149 Credits</b>

**ME Curriculum : 149 Credits****Course Credits (lecture-practice-self study hours)****First Year****Semester I**

EL171	English Course II	3(3-0-6)
ITS100	Introduction to Computers and Programming	3(2-3-4)
MAS116	Mathematics I	3(3-0-6)
SCS126	Chemistry for Engineers	3(3-0-6)
SCS138	Applied Physics I	3(3-0-6)
SCS176	Chemistry Laboratory	1(0-3-0)
SCS183	Physics Laboratory I	1(0-3-0)
TU100	Civic Education	3(3-0-6)
TU130	Integrated Sciences and Technology	2(2-0-4)
<b>Sub-Total</b>		<b>22(19-9-38)</b>

**Semester II**

EL172	English Course III	3(3-0-6)
GTS132	Introduction to Biological Science	3(3-0-6)
GTS133	Environmental Studies	3(2-2-5)
MAS117	Mathematics II	3(3-0-6)
SCS139	Applied Physics II	3(3-0-6)
SCS184	Physics Laboratory II	1(0-3-0)
TU140	Thai Studies	3(3-0-6)
<b>Sub-Total</b>		<b>19(17-5-35)</b>

**Second Year****Semester I**

ECS203	Basic Electrical Engineering	3(3-0-6)
IES301	Manufacturing Tools and Operations	3(2-3-4)
MAS210	Mathematics III	3(3-0-6)
MAS215	Differential Equations	3(3-0-6)
MES300	Engineering Drawing	3(2-3-4)
MES311	Thermodynamics	3(3-0-6)
MES350	Engineering Statics	3(3-0-6)
<b>Sub-Total</b>		<b>21(19-6-38)</b>

**Semester II**

ECS204	Basic Electrical Engineering Laboratory	1(0-3-0)
ECS306	Basic Electrical Machines and Power System	3(3-0-6)
GTS202	English Language Structures	3(3-0-6)
MES302	Introduction to Computer Aided Design	2(1-3-2)
MES331	Solid Mechanics I	3(3-0-6)
MES341	Fluid Dynamics	3(3-0-6)
MES351	Engineering Dynamics	3(3-0-6)
TU110	Integrated Humanities	2(2-0-4)
<b>Sub-Total</b>		<b>20(18-6-36)</b>

**Third Year****Semester I**

ECS307	Basic Electromechanical Energy Conversion Laboratory	1(0-3-0)
GTS302	Technical Writing	2(2-1-3)
MES342	Refrigeration and Air Conditioning	3(3-0-6)
MES352	Mechanics of Machinery	3(3-0-6)
MES371	Material Science for Engineers	3(3-0-6)
MES391	Mechanical Engineering Laboratory I	2(1-3-2)

**Option I: General Mechanical Engineering**

IES341	Engineering Economy	3(3-0-6)
MES381	Measurement and Instrumentation	3(3-0-6)
<b>Sub-Total</b>		<b>20(18-7-35)</b>

**Option II: Energy Management**

MES444	Renewable Energy Resources	3(3-0-6)
MES474	Thermal Energy Management	3(3-0-6)
<b>Sub-Total</b>		<b>20(18-7-35)</b>

**Course Credits (lecture-practice-self study hours)****Semester II**

IES361	Manufacturing Process Design	3(3-0-6)
MES321	Heat Transfer	3(3-0-6)
MES333	Design of Machine Elements	3(3-0-6)
MES382	Vibration and Noise Control	3(3-0-6)
MES383	Hydraulic and Pneumatic Control	3(3-0-6)
MES392	Mechanical Engineering Laboratory II	2(1-3-2)

**Option I: General Mechanical Engineering**

MES313	Internal Combustion Engines	3(3-0-6)
<b>Sub-Total</b>		<b>20(19-3-38)</b>

**Option II: Energy Management**

MES312	Combustion and Emission Control	3(3-0-6)
<b>Sub-Total</b>		<b>20(19-3-38)</b>

**Summer**

Select either Senior Project Track, Foreign Exchange Track, or Extended Training Track.

**1. Senior Project Track and Foreign Exchange Track**

MES303	Mechanical Engineering Training	0(0-0-0)
<b>Sub-Total</b>		<b>0(0-0-0)</b>

**2. Extended Training Track**

XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
<b>Sub-Total</b>		<b>6(x-x-x)</b>

**Fourth Year****Semester I**

MES403	Senior Project I	1(0-2-1)
MES422	Thermal System Design	3(3-0-6)
MES462	Turbomachinery	3(3-0-6)
MES481	Power Plant Engineering	3(3-0-6)
TU120	Integrated Social Sciences	2(2-0-4)

**Option I: General Mechanical Engineering**

IES371	Engineering Management	3(3-0-6)
<b>Sub-Total</b>		<b>15(14-2-29)</b>

**Option II: Energy Management**

MES473	Energy Economics	3(3-0-6)
<b>Sub-Total</b>		<b>15(14-2-29)</b>

**Semester II****1) Senior Project Track**

MES407	Senior Project II	6(0-18-0)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
<b>Sub-Total</b>		<b>12(x-x-x)</b>

**2) Foreign Exchange Track**

MES405	Special Study in Mechanical Engineering I	3(3-0-6)
MES406	Special Study in Mechanical Engineering II	3(3-0-6)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
<b>Sub-Total</b>		<b>12(x-x-x)</b>

**3) Extended Training Track**

MES408	Extended Mechanical Engineering Training	6(0-40-0)
<b>Sub-Total</b>		<b>6(0-40-0)</b>