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 of 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 in industry.

Structure and Components

1. General Basic Courses	**30 Credits**
1.1 Part I	21 Credits
1.1.1 Social Sciences	6 Credits
1.1.2 Humanities	3 Credits
1.1.3 Science and Mathematics	3 Credits
1.1.4 Languages	9 Credits
1.2 Part II	9 Credits
2. Major Courses	**113 Credits**
2.1 Basic Courses	40 Credits
2.2 Specialized Courses	73 Credits
3. Free Elective Courses	**6 Credits**
Total	**149 Credits**

Details of the Curriculum

1. General Basic Courses **30 Credits**

1.1 Part I 21 Credits

1.1.1 Social Sciences (2 courses) 6 Credits
TU100 TU101

1.1.2 Humanities (1 course) 3 Credits
TU102

1.1.3 Science and Mathematics (1 courses) 3 Credits
TU103

1.1.4 Languages (3 courses) 9 Credits
TU104 TU105 TU106

1.2 Part II 9 Credits
GTS133 GTS202 ITS100

2. Major Courses **113 Credits**

2.1 Basic Courses **40 Credits**

2.1.1 Basic Mathematics and Science Courses (10 courses) 24 Credits
MAS116 MAS117 MAS210 MAS215
SCS126 SCS138 SCS139 SCS176
SCS183 SCS184

2.1.2 Basic Engineering Courses (7 courses) 16 Credits
EES203 EES204 EES306 EES307
GTS302 IES301 IES361

2.2 Specialized Courses **73 Credits**

2.2.1 Compulsory Engineering Courses 55 Credits

2.2.1.1 Mechanical Design (11 courses) 28 Credits
MES300 MES302 MES331 MES333
MES350 MES352 MES371 MES391
MES392 MES403 MES462

2.2.1.2 Thermal Science and Fluid Mechanics (7 courses) 21 Credits
MES311 MES321 MES341 MES342
MES383 MES422 MES484

2.2.1.3 Dynamic Systems and Control (2 courses) 6 Credits
MES351 MES382

2.2.2 Elective Engineering Courses 18 Credits

2.2.2.1 Students choose one of three optional tracks: 6 Credits

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 MES409

3. For Students who wish to join the Extended Training Track (1 course)
MES408

2.2.2.2 Students choose one of two optional studies: 12 Credits

2.2.2.2.1 Option I: General Mechanical Engineering (4 courses)
IES341 IES371 MES313 MES381

2.2.2.2.2 Option II: Energy Management (4 courses)
MES312 MES444 MES473 MES474

3. Free Elective Courses **6 Credits**

Students may choose any free elective courses (not less than 6 credits in total) offered by SIIT or TU, including general basic courses, except:

1. General basic courses in Science and Mathematics.
2. General basic TU courses.
3. Courses with contents similar to those of other courses in the curriculum already taken by the students.

Total Credit Requirement **149 Credits**

ME Curriculum : 149 Credits

First Year

Semester I

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)
TU103	Life and Sustainability	3(3-0-6)
TU104	Critical Thinking, Reading, and Writing	3(3-0-6)
	Sub-Total	**20(18-6-36)**

Semester II

GTS133	Environmental Studies	3(3-0-6)
ITS100	Introduction to Computers and Programming	3(2-3-4)
MAS117	Mathematics II	3(3-0-6)
SCS139	Applied Physics II	3(3-0-6)
SCS184	Physics Laboratory II	1(0-3-0)
TU105	Communication Skills in English	3(3-0-6)
TU106	Creativity and Communication	3(3-0-6)
	Sub-Total	**19(17-6-34)**

Second Year

Semester I

EES203	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)
	Sub-Total	**21(19-6-38)**

Semester II

EES204	Basic Electrical Engineering Laboratory	1(0-3-0)
EES306	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)
TU102	Social Life Skills	3(3-0-6)
	Sub-Total	**21(19-6-38)**

Third Year

Semester I

EES307	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)
	Sub-Total	**20(18-7-35)**
	Option II: Energy Management	
MES444	Alternative and Renewable Energy Resources	3(3-0-6)
MES474	Thermal Energy Management	3(3-0-6)
	Sub-Total	**20(18-7-35)**

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)
	Sub-Total	**20(19-3-38)**
	Option II: Energy Management	
MES312	Combustion and Emission Control	3(3-0-6)
	Sub-Total	**20(19-3-38)**

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	1(0-40-0)
	Sub-Total	**1(0-40-0)**

2. Extended Training Track

XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
	Sub-Total	**6(x-x-x)**

Fourth Year

Semester I

MES403	Mechanical Engineering Project I	1(0-2-1)
MES422	Thermal System Design	3(3-0-6)
MES462	Turbomachinery	3(3-0-6)
MES484	Automatic Control	3(3-0-6)
TU101	Thailand, ASEAN, and the World	3(3-0-6)
	Option I: General Mechanical Engineering	
IES371	Engineering Management	3(3-0-6)
	Sub-Total	**16(15-2-31)**
	Option II: Energy Management	
MES473	Energy Economics	3(3-0-6)
	Sub-Total	**16(15-2-31)**

Semester II

1) Senior Project Track

MES407	Mechanical Engineering Project II	5(0-15-0)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
	Sub-Total	**11(x-x-x)**

2) Foreign Exchange Track

MES405	Special Study in Mechanical Engineering I	3(3-0-6)
MES409	Special Study in Mechanical Engineering III	2(2-0-4)
XXXxxx	Free Elective	3(x-x-x)
XXXxxx	Free Elective	3(x-x-x)
	Sub-Total	**11(x-x-x)**

3) Extended Training Track

MES408	Extended Mechanical Engineering Training	6(0-40-0)
	Sub-Total	**6(0-40-0)**