

SELECTION OF ELECTIVES- ME PROGRAM

MECHANICAL ENGINEERING (ME) PROGRAM

List of technical electives (ME Program)

Students enrolled in the Mechanical engineering program are allowed to take two courses (each three credit hours) from: College of Science, College of Engineering Sciences, or College of Computer Science & Engineering, with the following restrictions:

- 1) The course must be 3XX or 4XX levels.
- 2) The following courses are not accepted because of overlap with ME required courses: CE 432, CHE 300, CHE 303.
- 3) The following courses overlap with ME elective courses and will not be credited if both are taken: CHE 432/ME437, CHE 463/ME 480, CHE 472/ME 472, CHE 473/ME 496, CHE 480

List of major electives

(TWO ME ELECTIVES ME 4XX CAN BE TAKEN)

One of them say ME 4xx -ME (Design) Elective 1 must be from a restricted list of Electives with Major Design Components (Table 1)

The second ME Elective can be any course from the all ME Elective list in (Table

Table 1- Select One Elective from the Following List (ME 4xx- ME (Design) Elective 1)

**Mandatory ME (Design) Elective I
Tentative List**

(One Course (3 credits) from the Following List)

- ME 437 Design and Rating of Heat Exchangers
- ME 438 Pumping Machinery
- ME 463 Tool Design (Production Engineering I)
- ME 469 Computer-Aided Manufacturing(CAD/CAM)
- ME 483 Mechanisms – Theory and Design (3-0-3)
- ME 485 Mechanical System Design
- ME 486 Optimization of Mechanical Systems
- ME 489 FEA in Mechanical Design
- ME 443: Mechanics of Robotic Manipulators (3-0-3)
- ME 444: Introduction to Mechatronics (2-3-3) *(MIT Collaboration Benefit)*
A mutli-discipline course ME ,EE and SE Department
- ME 409: Design and Manufacturing of Composite Structures (3-0-3)

- **ME 442 Design of PV-Solar Systems (3-0-3) (MIT Collaboration Benefit) A mutli-discipline course ME and EE Department**
- **ME 408 Rapid Prototyping and Digital Manufacturing (2-3-3)**
- **ME 459 Design of Renewable Energy Systems (3-0-3) (MIT Collaboration Benefit) A mutli-discipline course ME and CHE Department**
- **ME 465 : Designing Robust Products and Systems (3-0-3) (MIT Collaboration Benefit) A mutli-discipline course ME and SE Department**

Table 2- Select One Elective from the Following List (ME 4xx- ME Elective II)

ME 408 Rapid Prototyping and Digital Manufacturing	(2-3-3)
ME 409 Design and Manufacturing of Composite Structures	(3-0-3)
ME 410 Ceramics	(3 0 3)
ME 422 Propulsion Systems	(3-0-3)
ME 423 Energy Conversion	(3-0-3)
ME 424 Maintenance Engineering	(3-0-3)
ME 425 Compressible Fluid Flow	(3-0-3)
ME 427 Turbomachinery	(3-0-3)
ME 428 Structure of Flight Vehicles	(3-0-3)
ME 430 Air Conditioning	(3-0-3)
ME 431 Refrigeration	(3-0-3)
ME 432 Internal Combustion Engines	(3-0-3)
ME 433 Fundamentals of Combustion	(3-0-3)
ME 434 Wind Engineering	(3-0-3)
ME 435 Thermal Power Plants	(2-3-3)
ME 436 Fluid Power Systems	(3-0-3)

ME 437 Design and Rating of Heat Exchangers	(3-0-3)
ME 438 Pumping Machinery	(3-0-3)
ME 439 Solar Energy Conversion	(3-0-3)
ME 440 Convective Heat and Mass Transfer	(3-0-3)
ME 441 Energy and the Environment	(3-0-3)
ME 442 Design of PV-Solar Systems	(3-0-3)
ME 443 Mechanics of Robotic Manipulators	(3-0-3)
ME 444 Introduction to Mechatronics	(2-3-3)
ME 445 Principles of Nanostructure Materials & Sensor Technology	(3 0 3)
ME 446 Computational Fluid Dynamics and Heat Transfer	(3-0-3)
ME 450 Mechanical Engineering Experimentation	(2-3-3)
ME 459 Design and Operation of Renewable Energy Systems	(3-0-3)
ME 460 Thermal Desalination Systems	(3-0-3)
ME 462 Products and Systems Reliability	
ME 461 Risk Management Tools In Systems Design and Operation	(3-0-3)
ME 463 Tool Design	(3-0-3)
ME 464 Quality in Manufacturing	(3-0-3)
ME 465 Designing Robust Products and Systems	(3-0-3)
ME466 Fundamentals of Heat Treatment	(3-0-3)
ME 468 Casting and Welding Engineering	(3-0-3)
ME 469 Computer-Aided Manufacturing	(3-0-3)
ME 471 Mechanical Metallurgy	(3-0-3)
ME 472 Corrosion Engineering I	(3-0-3)

ME 473 Corrosion Engineering II	(3-0-3)
ME 474 Physical Metallurgy	(3-0-3)
ME 475 Mechanical Behavior of Materials	(3-0-3)
ME 476 Non-Metallic Materials	(3-0-3)
ME 477 Non-Ferrous Extractive Metallurgy	(3-0-3)
ME 478 Iron and Steel Making	(3-0-3)
ME 479 Modern Materials	(3-0-3)
ME 480 Plastics Materials and Processing	(3-0-3)
ME 481 Advanced Dynamics	(3-0-3)
ME 482 Mechanical Vibrations.	(3-0-3)
ME 483 Mechanisms	(2-3-3)
ME 484 Acoustics	(3-0-3)
ME 485 Mechanical System Design	(3-0-3)
ME 486 Optimization of Mechanical Systems	(3-0-3).
ME 487 Mechanics of Materials	(3-0-3)
ME 488 Systems Control	(3-0-3)
ME 489 Finite Element Analysis in Mechanical Design	(3-0-3)
ME 494 Fundamentals of Nondestructive Evaluation	(3-0-3)
ME495 Directed Research / BSc Research Thesis	(3-0-3)
ME 490 Special Topics in Mechanical Engineering	(3-0-3)
ME 491 Special Topics in Energy	(3-0-3)
ME 492 Special Topics in Dynamics & Control	(3-0-3)

ME 493 Special Topics in Materials & Manufacturing

(3-0-3)

List of general electives

The students can take any GS course with the following conditions

GS Elective 1 - can be taken any 200 or above level course from GS courses

GS Elective 2 - can be taken from any 200 or above level course from GS courses

List of courses to be included in major GPA calculation.

ME 201 Dynamics	(3-0-3)
ME 203 Thermodynamics I	(3-0-3)
ME 204 Thermodynamics II	(3-0-3)
ME 205 Materials Science (for non-ME students)	(2-3-3)
ME 210 Mechanical Engineering Drawing & Graphics	(2-3-3)
ME 216 Materials Science and Engineering	(3-0-3)
ME 217 Materials Lab	(0-3-1)
ME 218 Introduction to Mechanical Engineering Design	(1-3-2)
ME 307 Machine Design I	(3-0-3)

ME 308 Machine Design II	(3-3-4)
ME 309 Mechanics of Machines	(3-0-3)
ME 311 Fluid Mechanics	(3-0-3)
ME 315 Heat Transfer	(3-0-3)
ME 316 Thermofluids Lab	(0-3-1)
ME 322 Manufacturing Processes	(3-0-3)
ME 323 Manufacturing Lab	(0-3-1)
ME 351 Applied Mechanical Engineering Cooperative Work	(0-0-9)
ME 399 Summer Training	(0-0-0)
ME 411 Senior Design Project I	(1-0-1)
ME 412 Senior Design Project II	(0-6-2)
ME 413 Systems Dynamics and Control	(2-3-3)
ME 451 Design and Analysis of Engineering Experiments	(3-0-3)
ME 452 Measurements and Lab	(0-3-1)
ME 4xx ME Elective 1	(3-0-3) or (2-2-3)
ME 4xx ME Elective 2	(3-0-3) or (2-2-3)