UPDATED CURRICULUM

Mechanical Engineering Program (MEC)

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
COLLEGE OF ENGINEERING
MAJMAAH UNIVERSITY

Updated curriculum of Mechanical Engineering Program (2-Semesters academic year)
131-units Study Plan

Updated MEC Curriculum

ME CURRICULUM STATISTICS

#	Requirement	Units	%
1	MU requirements	12	7.3
2	COE requirements	48	29.3
3	Program requirements	60	36.6
4	Specialization requirements	19	11.6
5	Preparatory Year (PY)	25	15.2
Total		164	100

COLOR MAP

University requirement	College requirement	Program requirement	Specialization requirement	Professional certificate	Exit point

FOUNDATION YEAR (33 UNITS)

Level	Course Code		Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 1	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	ENGL	001	English Language 1	R	---	6(5,0,9)	Foundation
	MATH	001	Pre-Calculus	R	---	3(3,1,0)	Foundation
	COMS	001	Computer Skills	R	---	2(1,0,2)	Foundation
	PHYS	001	General Physics	R	---	3(3,1,0)	Foundation
					Total	16 (27)	
Level 2	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	ENGL	002	English Language 2	R	ENGL 001	6(5,0,9)	Foundation
	MATH	002	Differential Calculus	R	MATH 001	3(3,1,0)	Foundation
	ENGL	003	Scientific and Engineering English Language	R	ENGL 001	2(1,0,2)	Foundation
	CHMS	001	General Chemistry	R	---	4(3,1,2)	College
					Total	17 (29)	

FIRST YEAR (32 UNITS)

Level 3	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	MATH	103	Integral Calculus	R	MATH 002	3(3,1,0)	College
	PHYS	102	Physics	R	PHYS 001	4(3,1,2)	College
	GENG	102	Statics	R	---	3(3,1,0)	College
	FENG	101	Introduction to Engineering	R	---	1(1,0,0)	College
	GENG	101	Principles of Engineering Drawing	R	---	3(1,0,4)	College
					Total	16 (22)	
Level 4	GENG	103	Fundamentals of Engineering Technology	R	---	2(1,0,2)	College
	ENGL	104	Engineering English Language	R	ENGL 003	2(1,0,2)	College
	GENG	104	Dynamics	R	GENG 102	3(3,1,0)	College
	MATH	104	Algebra and Analytic Geometry	R	---	3(3,1,0)	College
	MEC	121	Mechanical Engineering Drawing	R	GENG 101	3(1,0,4)	Department
	MEC	151	Thermodynamics I	R	-	3(3,1,0)	Department
					Total	16 (23)	
Professional certificate: AutoCAD							

SECOND YEAR (32 UNITS)

Level 5	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	MATH	207	Differential Equations	R	MATH 103	3(3,1,0)	College
	GENG	205	Engineering Ethics	R	---	1(1,0,0)	College
	MEC	231	Materials Science & Engineering	R	CHMS 001	3(2,1,2)	Department
	MEC	241	Machine dynamics	R	GENG 104	2(2,1,0)	Department
	MEC	232	Mechanics of Materials	R	GENG 102	3(3,1,0)	Department
	MEC	252	Thermodynamics II	R	MEC 151	2(2,1,0)	Department
					Total	16 (22)	
Level 6	STAT	201	Statistics and Probability	R	---	3(3,1,0)	College
	MEC	212	Manufacturing Processes	R	GENG 103	3(2,1,2)	Department
	MEC	222	Machine Elements Design	R	MEC 232	3(2,1,2)	Department
	MEC	242	Mechanical vibrations	R	MEC 241	3(2,1,2)	Department
	MEC	253	Fluid Mechanics	R	MEC 252	4(3,1,2)	Department
					Total	16 (25)	
Exit point: Diploma in Mechanical Engineering							
Professional certificate: Piping Engineering							

	Foundation Year (FY)	First Year	Second Year	Total	Total without FY
Cr. Hrs	33	32	32	97	64

THIRD YEAR (33 UNITS)

Level 7	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	GENG	306	Engineering Report Writing	R	STAT 201	2(2,0,0)	College
	EEL	302	Electric circuits and machines	R	PHYS 102	3(3,1,0)	Department
	MEC	301	Computer Programming for mechanical engineering	R	-	2(1,1,2)	Department
	MEC	354	Heat transfer	R	MEC 253	3(3,1,0)	Department
	MEC	344	Automatic control	R	MEC 242	2(2,1,0)	Department
	MEC	323	Mechanical design	R	MEC 222	3(3,1,0)	Department
					Total	17 (23)	

THERMO-FLUIDS ENGINEERING TRACK

Level	Course Code		Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 8	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	MATH	306	Numerical Methods	R	MATH 207	3(3,1,0)	College
	MEC	311	Mechanical measurements	R	MEC 253	3(2,1,2)	Department
	MEC	345	Machinery fault diagnosis	R	MEC 242	2(2,1,0)	Department
	MEC	364	Desalination Plants	R	MEC 354	3(3,1,0)	Track
	MEC	355	Refrigeration & Air Conditioning	R	MEC 354	3(2,1,2)	Track
					Total	16 (23)	
Professional certificate: HVAC professional course							

MEC	390	Field Training	R	Department Approval (successful completion of 110 units excluding FY)	3	Department

FOURTH YEAR (31 UNITS)

Level 9	GENG	408	Energy Efficiency	R	---	2(2,1,0)	College
	GENG	407	Engineering Economy	R	---	2(2,1,0)	College
	MEC	498	Senior Design 1	R	GENG 306	2(2,0,0)	Department
	MEC	466	Renewable energy	R	MEC 354	3(3,1,0)	Department
	MEC	493	Thermo-fluids Engineering Lab	R	MEC 311	1(0, 0, 2)	Track
	MEC	XXX	Elective Course 1	E	---	3(3,1,0)	Track
	MEC	468	Applied heat transfer		MEC 354	3(2,1,2)	Track
				R	Total	16	
Level 10	GENG	409	Sustainability	R	GENG 408	2(2,1,0)	College
	GENG	410	Engineering Project management	R	---	2(2,1,0)	College
	MEC	499	Senior Design 2	R	MEC 498	2(1,0,2)	Department
	MEC	481	Safety engineering	R	GENG 103	3(3,1,0)	Department
	MEC	XXX	Elective Course 2	E	---	3(3,1,0)	Track
	MEC	460	Power plants	R	MEC 354	3(3,1,0)	Track
					Total	15	

ELECTIVE COURSES (6 CREDIT HOURS):

Course Code	Course Number	Course Title	Required or Elective	Pre-Req.	CH	Type of requirements (Institution, College or Department)
MEC	458	Turbomachinery	E	MEC 253	3(3,1,0)	Track
MEC	459	Internal Combustion Engines	E	MEC 252	3(3,1,0)	Track
MEC	465	Energy Conversions	E	MEC 354	3(3,1,0)	Track
MEC	456	Turbulent flow	E	MEC 253	3(3,1,0)	Track
MEC	463	Gas dynamics	E	MEC 252	3(3,1,0)	Track
MEC	467	Ventilation and Air Conditioning Systems	E	MEC 355	3(3,1,0)	Track

DESIGN AND MANUFACTURING ENGINEERING TRACK

Level	Course Code		Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 8	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	MATH	306	Numerical Methods	R	MATH 207	3(3,1,0)	College
	MEC	311	Mechanical measurements	R	MEC 253	3(2,1,2)	Department
	MEC	345	Machinery fault diagnosis	R	MEC 242	2(2,1,0)	Department
	MEC	317	Modern Manufacturing technology	R	MEC 212	3(2,1,2)	Track
	MEC	324	Computer Aided Design (CAD)	R	MEC 323	3(2,0,3)	Track
					Total	16 (24)	
Professional certificate: Certified SOLIDWORKS Professional (CSWP)							

MEC	390	Field Training		R	Department Approval (successful completion of 110 units excluding FY)	3	Department

FOURTH YEAR (31 UNITS)

Level 9	GENG	408	Energy Efficiency	R	---	2(2,1,0)	College
	GENG	407	Engineering Economy	R	---	2(2,1,0)	College
	MEC	498	Senior Design 1	R	GENG 306	2(2,0,0)	Department
	MEC	466	Renewable energy	R	MEC 354	3(3,1,0)	Department
	MEC	491	Mechanical Design and Manufacturing Lab	R	MEC 311	1(0, 0, 2)	Track
	MEC	XXX	Elective Course 1	E	--	3(-, -, -)	Track
	MEC	415	Computer-aided Manufacturing (CAM)	R	MEC 212, MEC 324	3(2,1,2)	Track
					Total	16	
Level 10	GENG	409	Sustainability	R	GENG 408	2(2,0,0)	College
	GENG	410	Engineering Project management	R	---	2(2,1,0)	College
	MEC	499	Senior Design 2	R	MEC 498	2(1,0,2)	Department
	MEC	481	Safety engineering	R	GENG 103	3(3,1,0)	Department
	MEC	XXX	Elective Course 2	E		3(-, -, -)	Track
	MEC	437	Non-destructive Testing of Materials	R	MEC 231, MEC 311	3(2,1,2)	Track
					Total	15	

ELECTIVE COURSES (6 CREDIT HOURS):

Course Code	Course Number	Course Title	Required or Elective	Pre-Req.	CH	Type of requirements (Institution, College or Department)
MEC	426	Design of Production Facilities	E	MEC 323	3(3,1,0)	Track
MEC	428	Tribology	E	MEC 231	3(3,1,0)	Track
MEC	435	Composite Materials	E	MEC 231	3(3,1,0)	Track
MEC	416	Welding Technology	E	MEC 212	3(2,1,2)	Track
MEC	434	Powder Metallurgy	E	MEC 231	3(2,1,2)	Track
MEC	436	Introduction to Nanomaterials	E	MEC 231	3(3,1,0)	Track

INDUSTRIAL ENGINEERING TRACK

Level	Course Code		Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College or Department)
Level 8	MURE	XXX	University Requirement	R	---	2(2,0,0)	University
	MATH	306	Numerical Methods	R	MATH 207	3(3,1,0)	College
	MEC	311	Mechanical measurements	R	MEC 253	3(2,1,2)	Department
	MEC	345	Machinery fault diagnosis	R	MEC 242	2(2,1,0)	Department
	MEC	373	Reliability & Maintenance Engineering	R	GENG 103, STAT 201	3(3,1,0)	Track
	MEC	371	Operations Research	R	MATH 104	3(3,1,0)	Track
				R	Total	16 (22)	
Professional certificate: Project Management Professional (PMP)							
	MEC	390	Field Training	R	Department Approval (successful completion of 110 units excluding FY)	3	Department

FOURTH YEAR (31 UNITS)

Level 9	GENG	408	Energy Efficiency	R	---	2(2,1,0)	College
	GENG	407	Engineering Economy	R	---	2(2,1,0)	College
	MEC	498	Senior Design 1	R	GENG 306	2(2,0,0)	Department
	MEC	466	Renewable energy	R	MEC 354	3(3,1,0)	Department
	MEC	4XX	Elective Course 1	E	--	3(-, -, -)	Track
	MEC	495	Work study & Human factors Engineering Lab	R	MEC 311 & CO-MEC 474	1(0,0,3)	Track
	MEC	474	Human factors engineering	R	MEC 371	3(3,1,0)	Track
					Total	16	
Level 10	GENG	409	Sustainability	R	GENG 408	2(2,0,0)	College
	GENG	410	Engineering Project management	R	---	2(2,1,0)	College
	MEC	499	Senior Design 2	R	MEC 498	2(1,0,2)	Department
	MEC	481	Safety engineering	R	GENG 103	3(3,1,0)	Department
	MEC	XXX	Elective Course 2	E	---	3(-, -, -)	Track
	MEC	476	Inventory Control	R	MEC 371	3(2,1,2)	Track
					Total	15	

ELECTIVE COURSES (6 CREDIT HOURS):

Course Code	Course Number	Course Title	Required or Elective	Pre-Req.	CH	Type of requirements (Institution, College or Department)
MEC	472	Quality Control	E	STAT 201	3(3,1,0)	Track
MEC	485	Production planning and control	E	MEC 371	3(3,1,0)	Track
MEC	486	Design of Manufacturing Systems	E	MEC 371	3(2,1,2)	Track
MEC	487	Manufacturing economics	E	GENG 307	3(3,1,0)	Track
MEC	482	Supply chain management	E	MEC 371	3(2,1,2)	Track
MEC	484	Engineering optimization	E	MEC 371	3(2,1,2)	Track