AC 6/6/2012
Item No. 4.76

UNIVERSITY OF MUMBAI

Bachelor of Engineering

First Year Engineering (Semester I & II), Revised course (REV- 2012) from Academic Year 2012 -13, (Common for All Branches of Engineering)

(As per Credit Based Semester and Grading System with effect from the academic year 2012–2013)

First Year Engineering (Semester I & II), Revised course from Academic Year 2012 -13, (REV- 2012),

Sub Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Pract.	Tut.	Theory	TW/Pract	Tut.	Total
FEC101	Applied Mathematics-I	04	-	01	04		01	05
FEC102	Applied Physics-I	03	01	-	03	0.5	-	3.5
FEC103	Applied Chemistry -I	03	01	-	03	0.5	-	3.5
FEC104	Engineering Mechanics	05	02	-	05	01	-	06
FEC105	Basic Electrical & Electronics Engineering	04	02	-	04	01	-	05
FEC106	Environmental studies	02	-	-	02	-	-	02
FEL101	Basic Workshop Practice-I	-	04	-	-	02	-	02
		21	10	01	21	05	01	27

(Common for all branches of Engineering)

Scheme for FE - Semester - I

Sub. Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Pract.	Oral	Total
		Internal Assessment			End sem. exam				
		Test 1	Test 2	Average of Test 1 and Test 2					
FEC101	Applied Mathematics-I	20	20	20	80	25	-	-	125
FEC102	Applied Physics-I	15	15	15	60	25	-	-	100
FEC103	Applied Chemistry -I	15	15	15	60	25	-	-	100
FEC104	Engineering Mechanics	20	20	20	80	25	-	25	150
FEC105	Basic Electrical & Electronics Engineering	20	20	20	80	25	-	25	150
FEC106	Environmental studies	15	15	15	60	-	-	-	75
FEL101	Basic Workshop Practice-I	-	-	-	-	50	-	-	50
				105	420	175		50	750

First Year Engineering (Semester I & II), Revised course from Academic Year 2012 -13, (REV- 2012), (Common for all branches)

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Pract.	Tut.	Theory	TW/Pract	Tut.	Total
FEC201	Applied Mathematics-II	04	-	01	04		01	05
FEC202	Applied Physics-II	03	01	-	03	0.5	-	3.5
FEC203	Applied Chemistry -II	03	01	-	03	0.5		3.5
FEC204	Engineering Drawing	03	04	-	03	02	-	05
FEC205	Structured Programming Approach	04	02	-	04	01	-	05
FEC206	Communication Skills	02	02	-	02	01	-	03
FEL201	Basic Workshop Practice -II	-	04	-	-	02	-	02
		19	14	01	19	07	01	27

Scheme for Semester - II

Sub. Code	Subject Name	Examination Scheme							
		Theory marks				Term Work	Pract.	Oral	Total
		Internal Assessment			End sem. exam				
		Test 1	Test 2	Av. of Test 1 & 2					
FEC201	Applied Mathematics-II	20	20	20	80	25	-	-	125
FEC202	Applied Physics-II	15	15	15	60	25	-	-	100
FEC203	Applied Chemistry -II	15	15	15	60	25	-	-	100
FEC204	Engineering Drawing	15	15	15	60	25	50	-	150
FEC205	Structured Programming Approach	20	20	20	80	25	25	-	150
FEC206	Communication Skills	10	10	10	40	25	-	-	75
FEL201	Basic Workshop Practice-II	-	-	-	-	50	-	-	50
				95	380	200	75		750

AC29/4/2013 Item no 4.80

UNIVERSITY OF MUMBAI

Revised Syllabus

Program- Bachelor of Engineering

Course -Mechanical Engineering

(Second Year – Sem. III & IV)

Under

FACULTY OF TECHNOLOGY

(As per Credit Based Semester and Grading System from 2013-14)

Deans Preamble:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education.The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited. In line with this Faculty of Technology of University of Mumbai has taken a lead in incorporating philosophy of outcome based education in the process of curriculum development.

Faculty of Technology, University of Mumbai, in one of its meeting unanimously resolved that, each Board of Studies shall prepare some Program Educational Objectives (PEO's) and give freedom to affiliated Institutes to add few (PEO's) and course objectives and course outcomes to be clearly defined for each course, so that all faculty members in affiliated institutes understand the depth and approach of course to be taught, which will enhance learner's learning process. It was also resolved that, maximum senior faculty from colleges and experts from industry to be involved while revising the curriculum. I am happy to state that, each Board of studies has adhered to the resolutions passed by Faculty of Technology, and developed curriculum accordingly. In addition to outcome based education, semester based credit and grading system is also introduced to ensure quality of engineering education.

Semester based Credit and Grading system enables a much-required shift in focus from teacher-centric to learner-centric education since the workload estimated is based on the investment of time in learning and not in teaching. It also focuses on continuous evaluation which will enhance the quality of education. University of Mumbai has taken a lead in implementing the system through its affiliated Institutes and Faculty of Technology has devised a transparent credit assignment policy and adopted ten points scale to grade learner's performance. Credit assignment for courses is based on 15 weeks teaching learning process, however content of courses is to be taught in 12-13 weeks and remaining 3-2 weeks to be utilized for revision, guest lectures, coverage of content beyond syllabus etc.

Credit and grading based system was implemented for First Year of Engineering from the academic year 2012-2013. Subsequently this system will be carried forward for Second Year Engineering in the academic year 2013-2014, for Third Year and Final Year Engineering in the academic years 2014-2015 and 2015-2016 respectively.

Dr. S. K. Ukarande
Dean,
Faculty of Technology,
Member - Management Council, Senate, Academic Council
University of Mumbai, Mumbai

Chairman Preamble:

Engineering education in India is expanding and is set to increase manifold. Themajorchallenge in the current scenario is to ensure quality to the stakeholders along with expansion. To meet this challenge, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education and reflects the fact that in achieving recognition, the institution or program of study is committed and open to external review to meet certain minimum specified standards.The major emphasis of this accreditation process is to measure the outcomes of the program that is being accredited. Program outcomes are essentially a range of skills and knowledge that a student will have at the time of graduation from the program. In line with this Faculty of Technology of University of Mumbai has taken a lead in incorporating the philosophy of outcome based education in the process of curriculum development.

As the Chairman, Board of Studies in Mechanical Engineering of University of the Mumbai, I am happy to state here that, the Program Educational Objectives were finalized in a brain storming session, which was attended by more than 20 members from different affiliated Institutes of the University. They are either Heads of Departments or their senior representatives from the Department of Mechanical Engineering. The Program Educational Objectives finalized for the undergraduate program in Mechanical Engineering are listed below;

1. To prepare the Learnerwith a sound foundation in the mathematical, scientific and engineering fundamentals.
2. To prepare the Learner to use modern tools effectively in order to solve real life problems.
3. To prepare the Learner for a successful career in Indian and Multinational Organisations and to excel in their Postgraduate studies.
4. To encourage and motivate the Learnerin the art of self-learning.
5. To inculcate a professional and ethical attitude, good leadership qualities and commitment to social responsibilities in the Learner’s thought process.

In addition to the above, 2 to3 more program educational objectives of their own may be added by affiliated Institutes.

In addition to Program Educational Objectives, for each course of undergraduate program, objectives and expected outcomes from the point of view of a learnerare also included in the curriculum to support the philosophy of outcome based education. I strongly believe that even a small step taken in the right direction will definitely help in providing quality education to the major stake holders.

Dr. S. M. Khot
Chairman, Board of Studies in Mechanical Engineering, University of Mumbai

Program Structure for B E Mechanical Engineering

S. E. (Mechanical/Automobile) Sem.- III

Course Code	CourseName	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MEC301	Applied Mathematics III[@]	4	--	4	--	4
MEC302	Thermodynamics[$]	4	--	4	--	4
MEC303	Strength of Materials[$]	4	2	4	1	5
MEC304	Production Process- I[$]	4	--	4	--	4
MEL305	Computer Aided M/c Drawing[+]	--	2*+4	-	3	3
MEL306	Data Base &Information Retrieval System[#]	--	2*+2	-	2	2
MEL307	Machine Shop Practice- I[$]	--	4	--	2	2
Total		**16**	**16**	**16**	**8**	**24**

Course Code	CourseName	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
MEC301	Applied Mathematics III[@]	20	20	20	80	03	--	--	100
MEC302	Thermodynamics[$]	20	20	20	80	03	--	--	100
MEC303	Strength of Materials[$]	20	20	20	80	03	25	--	125
MEC304	Production Process- I[$]	20	20	20	80	03	--	--	100
MEL305	Computer Aided M/c Drawing[+]	--	--	--	--	--	50	50	100
MEL306	Data Base &Information Retrieval System[#]	--	--	--	--	--	50	50	100
MEL307	Machine Shop Practice- I[$]	--	--	--	--	--	50	--	50
Total		**--**	**--**	**80**	**320**	**--**	**175**	**100**	**675**

* Theory for entire class to be conducted, [@] Course common to Mech/Auto/Prod/Civil, [+]Course common to Mech/Auto/Prod, [#] Course common to Mech/Auto/Prod/Civil, [$] Courses common to Mech/Auto

S. E. (Mechanical/Automobile) Sem.- IV

Course Code	CourseName	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MEC401	Applied Mathematics IV[@]	4	--	4	--	4
MEC402	Fluid Mechanics[$]	4	2	4	1	5
MEC403	Theory of Machines- I[$]	4	2	4	1	5
MEC404	Production Process- II[$]	4	--	4	--	4
MEC405	Material Technology[$]	3	2	3	1	4
MEC406	Industrial Electronics[$]	3	2	3	1	4
MEL407	Machine Shop Practice- II[$]	--	4	--	2	2
Total		**22**	**12**	**22**	**6**	**28**

Course Code	CourseName	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
MEC401	Applied Mathematics IV[@]	20	20	20	80	03	--	--	100
MEC402	Fluid Mechanics[$]	20	20	20	80	03	25	25	150
MEC403	Theory of Machines- I[$]	20	20	20	80	03	25	--	125
MEC404	Production Process- II[$]	20	20	20	80	03	--	--	100
MEC405	Material Technology[$]	20	20	20	80	03	25	--	125
MEC406	Industrial Electronics[$]	20	20	20	80	03	25	25	150
MEL407	Machine Shop Practice- II[$]	--	--	--	--	--	50	25	75
Total		**--**	**--**	**120**	**480**	**--**	**150**	**75**	**825**

[@] Course common to Mech/Auto/Prod/Civil, [$] Courses common to Mech/Auto

Course Code	Course/Subject Name	Credits

UNIVERSITY OF MUMBAI

Bachelor of Engineering

Mechanical Engineering

Third Year (Sem. V & VI) and Final Year (Sem. VII & VIII)

Revised Syllabus (REV- 2012) w. e. f. Academic Year 2014 - 15 and 2015-2016 respectively

Under

FACULTY OF TECHNOLOGY

(As per Semester Based Credit and Grading System)

Deans Preamble

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Dr. S. M. Khot

Chairman, Board of Studies in Mechanical Engineering, University of Mumbai

Program Structure for B E Mechanical Engineering
T. E. Mechanical -(Semester V)

Subject Code	Subject Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MEC501	I C Engines [&]	4	2	4	1	5
MEC502	Mechanical Measurements and Control	4	2	4	1	5
MEC503	Production Process-III [&]	4	2	4	1	5
MEC504	Theory of Machines- II[&]	4	2	4	1	5
MEC505	Heat Transfer [&]	4	2	4	1	5
MEL5O1	Business Communication and Ethics [#]	-	2[$]+2	-	2	2
Total		**20**	**14**	**20**	**7**	**27**

Subject Code	Subject Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
MEC501	I C Engines [&]	20	20	20	80	03	25	25	150
MEC502	Mechanical Measurements and Control	20	20	20	80	03	25	25	150
MEC503	Production Process-III [&]	20	20	20	80	03	25	--	125
MEC504	Theory of Machines- II[&]	20	20	20	80	03	25	--	125
MEC505	Heat Transfer [&]	20	20	20	80	03	25	25*	150
MEL5O1	Business Communication and Ethics [#]	--	--	--	--	--	50	--	50
Total		**--**	**--**	**100**	**400**	**--**	**175**	**75**	**750**

[$] **Theory for entire class to be conducted** [#] **common for all engineering programs**
[&] **Common with Automobile Engineering** *** Only ORAL examination based on term work and syllabus**

T. E. Mechanical -(Semester VI)

Subject Code	Subject Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MEC601	Metrology and Quality Engineering	3	2	3	1	4
MEC602	Machine Design I [&]	4	2	4	1	5
MEC603	Mechanical Vibrations [&]	4	2	4	1	5
MEC604	Thermal and Fluid Power Engineering [&]	4	2	4	1	5
MEC605	Mechatronics	4	2	4	1	5
MEC606	Finite Element Analysis [&]	3	2	3	1	4
Total		**22**	**12**	**22**	**6**	**28**

Subject Code	Subject Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
MEC601	Metrology and Quality Engineering	20	20	20	80	03	25	25	150
MEC602	Machine Design I [&]	20	20	20	80	03	25	--	125
MEC603	Mechanical Vibrations [&]	20	20	20	80	03	25	25*`	150
MEC604	Thermal and Fluid Power Engineering [&]	20	20	20	80	03	25	--	125
MEC605	Mechatronics	20	20	20	80	03	25	--	125
MEC606	Finite Element Analysis [&]	20	20	20	80	03	25	25	150
Total		**--**	**--**	**120**	**480**	**--**	**150**	**75**	**825**

[&] **Common with Automobile Engineering** *** Only ORAL examination based on term work and syllabus**

UNIVERSITY OF MUMBAI

Bachelor of Engineering

Mechanical Engineering

Third Year (Sem. V & VI) and Final Year (Sem. VII & VIII)

Revised Syllabus (REV- 2012) w. e. f. Academic Year 2014 - 15 and 2015-2016 respectively

Under

FACULTY OF TECHNOLOGY

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Dr. S. M. Khot

Chairman, Board of Studies in Mechanical Engineering, University of Mumbai

B. E. Mechanical-(Semester VII)

Subject Code	Subject Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MEC701	Machine Design -II	4	2	4	1	5
MEC702	CAD/CAM/CAE [&]	4	2	4	1	5
MEC703	Mechanical Utility Systems	4	2	4	1	5
MEC704	Production Planning and Control	4	2	4	1	5
MEE701X	Elective- I	3	2	3	1	4
MEP701	Project- I	--	6[#]	--	3	3
Total		**19**	**16**	**19**	**8**	**27**

Subject Code	Subject Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
MEC701	Machine Design- II	20	20	20	80	03	25	25	150
MEC702	CAD/CAM/CAE[&]	20	20	20	80	03	25	25	150
MEC703	Mechanical Utility Systems	20	20	20	80	03	25	--	125
MEC704	Production Planning and Control	20	20	20	80	03	25	25*	150
MEE701X	Elective -I	20	20	20	80	03	25	--	125
MEP701	Project- I	--	--	--	--	--	50	--	50
Total		**--**	**--**	**100**	**400**	**--**	**175**	**75**	**750**

[&] Common with Automobile Engineering *** Only ORAL examination based on term work and syllabus**

B. E. Mechanical-(Semester VIII)

Subject Code	Subject Name	Teaching Scheme (Contact Hours)		Credits Assigned		
		Theory	Pract.	Theory	Pract.	Total
MEC801	Design of Mechanical Systems	4	2	4	1	5
MEC802	Industrial Engineering and Management	4	2	4	1	5
MEC803	Refrigeration and Air Conditioning	4	2	4	1	5
MEE802X	Elective- II	3	2	3	1	4
MEP802	Project- II	--	12[#]	--	6	6
Total		**15**	**20**	**15**	**10**	**25**

Subject Code	Subject Name	Examination Scheme							
		Theory					Term Work	Pract. /oral	Total
		Internal Assessment			End Sem. Exam.	Exam. Duration (in Hrs)			
		Test1	Test 2	Avg.					
MEC801	Design of Mechanical Systems	20	20	20	80	03	25	25	150
MEC802	Industrial Engineering and Management	20	20	20	80	03	25	--	125
MEC803	Refrigeration and Air Conditioning	20	20	20	80	03	25	25	150
MEE802X	Elective -II	20	20	20	80	03	25	--	125
MEP802	Project- II	--	--	--	--	--	50	100	150
Total		**--**	**--**	**80**	**320**	**--**	**150**	**150**	**700**

* Only ORAL examination based on term work and syllabus

# indicates work load of Learner (Not faculty) in VII and VIII semester for Project

Project –I and II: Students groups and load of faculty per week
Project Groups: Students can form groups with minimum 2 (Two) and not more than 4 (Four)
Faculty Load : In semester VII 1/2 hour per week per project group
In semester VIII 1 hour per week per project group
Each faculty is permitted to take (guide) maximum 4 (Four) project groups.

Course codes	**Elective I**	Course codes	**Elective II**
MEE7011	Product Life Cycle Management (PLM)	MEE8021	Micro Electro Mechanical Systems (MEMS)
MEE7012	Power Plant Engineering [&]	MEE8022	Renewable Energy Sources
MEE7013	Energy Management	MEE8023	Project Management [&]
MEE7014	Supply Chain Management [&]	MEE8024	Business Process Reengineering
MEE7015	Computational Fluid Dynamics [&]	MEE8025	Cryogenics
MEE7016	Advanced Turbo Machinery	MEE8026	Automobile Engineering
MEE7017	Piping Engineering	MEE8027	Process Equipment Design
MEE7018	Emission and Pollution Control	MEE8028	Alternative Fuels
MEE7019	Operations Research	MEE8029	Enterprise Resource Planning
MEE70110	Total Productive Maintenance (TPM)	MEE80210	World Class Manufacturing [&]
MEE70111	Robotics	MEE80211	Nanotechnology
MEE70112	Digital Prototyping for Product Design –I	MEE80212	Digital Prototyping for Product Design –II

[&] Common with Automobile Engineering