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

UNIVERSITY OF MUMBAI

Bachelor of Engineering

Computer Engineering (Second Year – Sem. III & IV)

Revised course

(REV- 2012) from

Academic Year 2012 -13

Under

FACULTY OF TECHNOLOGY

(As per Semester Based Credit and Grading System)

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 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

Preamble:

The engineering education in India in general is expanding in manifolds. Now, the challenge is to ensure its quality to the stakeholders along with the 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. 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.

The Program Educational Objectives finalized for undergraduate program in Computer Engineering are listed below:

1. To prepare Learner's with a sound foundation in the mathematical, scientific and engineering fundamentals
2. To prepare Learner's to use effectively modern tools to solve real life problems
3. To equip Learner's with broad education necessary to understand the impact of computer Technology in a global and social context
4. To encourage , motivate and prepare Learner's for Lifelong-learning
5. To inculcate professional and ethical attitude, good leadership qualities and commitment to social responsibilities

In addition to above 2 to3 more program educational objectives of their own may be added by affiliated Institutes. The Program outcomes are the skills and ability that Learner will demonstrate upon completion of undergraduate degree program in Computer Engineering. Few may be listed as follows:

1. Ability to effectively apply knowledge of computing and mathematics to computer science problems.
2. Ability to design, implement and evaluate computer-based components, systems, processes or programs to meet desired needs and specifications.
3. Ability and skills to effectively use state-of-the-art techniques and computing tools for analysis, design, and implementation of computing systems.
4. Ability to function effectively as a member of a team assembled to undertake a common goal.
5. An understanding of professional, ethical, legal, security, and social issues and responsibilities.
6. Ability to communicate effectively to both technical and non-technical audiences.
7. The ability to successfully pursue professional development thru lifelong learning

In addition to Program Educational Objectives, for each course of undergraduate program, Course Objectives and expected outcomes from learner's point of view are also included in the curriculum to support the philosophy of outcome based education. In order to achieve outcome 1,2,and 3 a major emphasis is planned towards designing Laboratory courses third year onwards. I believe strongly that small step taken in right direction will definitely help in providing quality education to the stake holders.

Dr. Prachi Gharpure

Chairperson, Adhoc Board of Studies in Computer Engineering

University of Mumbai, Mumbai

Program Structure for B.E. Computer Engineering

Second Year (Computer) (Semester III)

(REV 2012)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/ Pract	Tut	Total
CSC301	Applied Mathematics III*	4	-	1#	4	-	1	5
CSC 302	Object Oriented Programming Methodolgy*	4	2	-	4	1	-	5
CSC303	Data Structures	4	2	-	4	1	-	5
CSC304	Digital Logic Design and Analysis	3	2	-	3	1	-	4
CSC305	Discrete Structures	4	-	-	4	-	-	4
CSC306	Electronic Circuits and Communication Fundamentals	4	2	-	4	1	-	5
	Total	**23**	**8**	**1**	**23**	**4**	**1**	**28**

Course Code	Course Name	Examination Scheme							
		Internal Assesment							
		Internal Assesment			End Sem Exam	Exam Duration (in Hrs)	TW	Pract / oral	Tot
		Test 1	Test 2	Avg					
CSC301	Applied Mathematics III*	20	20	20	80	03	25!	-	125
CSC302	Object Oriented Programming Methodolgy*	20	20	20	80	03	25	25	150
CSC303	Data Structures	20	20	20	80	03	25	25	150
CSC304	Digital Logic Design and Analysis	20	20	20	80	03	25	-	125
CSC305	Discrete Structures	20	20	20	80	03	-	-	100
CSC306	Electronic Circuits and Communication Fundamentals	20	20	20	80	03	25	25	150
	Total	**-**	**-**	**120**	**480**	**-**	**125**	**75**	**750**

* Common Subjects with IT # Tutorial to be taken class wise ! **Tutorials will be evaluated as Term work**

Program Structure for B.E. Computer Engineering

Second Year (Computer) (Semester IV)

(REV 2012)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/ Pract	Tut	Total
CSC401	Applied Mathematics IV*	4	-	1	4	-	1#	5
CSC402	Analysis of Algorithms	4	2	-	4	1	-	5
CSC403	Computer Organization and Architecture*	4	2	-	4	1	-	5
CSC404	Data Base Management systems	4	2	-	4	1	-	5
CSC405	Theoretical Computer Science	4	-		4	-	-	4
CSC406	Computer Graphics	3	2	-	3	1	-	4
	Total	**23**	**8**	**1**	**23**	**4**	**1**	**28**

Course Code	Course Name	Examination Scheme							
		Internal Assesment							
		Internal Assesment			End Sem Exam	Exam Duration (in Hrs)	TW	Prac / oral	Tot
		Test 1	Test 2	Avg					
CSC401	Applied Mathematics IV*	20	20	20	80	03	25!	-	125
CSC402	Analysis of Algorithms	20	20	20	80	03	25	25	150
CSC403	Computer Organization and Architecture*	20	20	20	80	03	25	25	150
CSC404	Data Base Management systems	20	20	20	80	03	25	25	150
CSC405	Theoretical Computer Science	20	20	20	80	03	-	-	100
CSC406	Computer Graphics	20	20	20	80	03	25	25	150
	Total	**-**	**-**	**120**	**480**	-	**125**	**100**	**825**

* Common Subjects with IT # Tutorial to be taken class wise

! **Tutorials will be evaluated as Term work**

Program Structure for B.E. Computer Engineering

Third Year (Computer)
(Semester V)

(REV 2012)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/ Pract	Tut	Total
CPC501	Microprocessor	4	2	-	4	1	-	5
CPC502	Operating Systems	4	2	-	4	1	-	5
CPC503	Structured and Object Oriented Analysis and Design	4	2	-	4	1	-	5
CPC504	Computer Networks	4	2	-	4	1	-	5
CPL501	Web Technologies Laboratory	-	4	-	-	2	-	2
CPL502	Business Communication and Ethics*	-	2	2	-	2		2
	Total	**18**	**12**	**2**	**16**	**8**	**-**	**24**

* 2 hours shown as Practicals to be taken class wise and 2 hours for tutorials to be taken as batch wise

Course Code	Course Name	Examination Scheme							
		Internal Assesment							
		Internal Assesment			End Sem Exam	Exam Duration (in Hrs)	TW	Oral / Pract	Total
		Test 1	Test 2	Avg					
CPC501	Microprocessor	20	20	20	80	03	25	25 prac	125
CPC502	Operating Systems	20	20	20	80	03	25	25 (prac	150
CPC503	Structured and Object Oriented Analysis and Design	20	20	20	80	03	25	25 (oral)	150
CPC504	Computer Networks	20	20	20	80	03	25	25 prac	150
CPL501	Web Technologies Laboratory	-	-	-	-	-	25	50 (oral)	75
CPL502	Business Communication and Ethics	-	-	-	-	-	50	-	50
	Total	**-**	**-**	80	320		175	150	725

Program Structure for B.E. Computer Engineering

Third Year (Computer) (Semester VI)

(REV 2012)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/ Pract	Tut	Total
CPC601	System Programming and Compiler Construction	4	2	-	4	1	-	5
CPC602	Software Engineering	4	2	-	4	1	-	5
CPC603	Distributed Databases	4	2	-	4	1	-	5
CPC604	Mobile Communication and Computing	4	2	-	4	1	-	5
CPE6011	Elective-I	3	-	-	-	2	-	2
CPL601	Network Programming Laboratory	-	4	-	-	2	-	2
	Total	**19**	**12**	**-**	**16**	**8**	**-**	**24**

Course Code	Course Name	Examination Scheme							
		Internal Assesment							
		Internal Assesment			End Sem Exam	Exam Duration (in Hrs)	TW	oral / pract	Tot
		Test 1	Test 2	Avg					
CPC601	System Programming and Compiler Construction	20	20	20	80	03	25	25 (pract)	150
CPC602	Software Engineering	20	20	20	80	03	25	25 (oral)	150
CPC603	Distributed Databases	20	20	20	80	03	25	25 (oral)	150
CPC604	Mobile Communication and Computing	20	20	20	80	03	25	25 (pract)	150
CPE601X	Elective-I	-	-	-	-	-	50	-	50
CPL601	Network Programming Laboratory	-	-	-	-	-	25	50 (oral	75
	Total	**-**	**-**	**80**	**320**	-	**175**	**150**	**725**

Elective I Sem 6

CPE6011 Operation Research

CPE6012 Project Management

CPE6013 Foreigh Language – German

CPE6014 Foreigh Language – French

Elective II Sem 7

System Group	**CPE7021**	Advance Algorithms
	CPE7022	Computer Simulation and Modeling
Electronics Group	**CPE7023**	Image Processing
Software Group	**CPE7024**	Software Architecture
	CPE7025	Soft Computing
DB Group	**CPE7026**	ERP and Supply Chain Management

Elective III - Sem 8

Electronics Group	**CPE8031**	Machine Learning
Digital Group	**CPE8032**	Embedded Systems
Network Group	**CPE8033**	Adhoc wireless networks
	CPE8034	Digital Forensic
DB Group	**CPE8035**	Big data Analytics

AC 7/6/2014
Item 4.27

UNIVERSITY OF MUMBAI

Bachelor of Engineering

Computer Engineering (Final Year – Sem. VII & VIII),
Revised course

(REV- 2012) from Academic Year 2015 - 16,
Under

FACULTY OF TECHNOLOGY

(As per Semester Based Credit and Grading System)

Preamble

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6. Ability to communicate effectively to both technical and non-technical audiences.
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In addition to Program Educational Objectives, for each course of undergraduate program,Course Objectives and expected outcomes from learner's point of view are also included in the curriculum to support the philosophy of outcome based education. I believe strongly that small step taken in right direction will definitely help in providing quality education to the stake holders.

Dr. Prachi Gharpure

Chairperson, Adhoc Board of Studies in Computer Engineering,

University of Mumbai, Mumbai

Program Structure B.E. Computer Engineering

Fourth Year (Computer) (Semester VII)

(REV 2012)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/ Pract	Tut	Total
CPC701	Digital Signal Processing	4	2	-	4	1	-	5
CPC702	Cryptography and System Security	4	2	-	4	1	-	5
CPC703	Artificial Intelligence	4	2	-	4	1	-	5
CPE7042X	Elective-II	4	2	-	4	1	-	5
CPP701	Project I	-	6#	-	-	3	-	3
CPL701	Network Threats and Attacks Laboratory	-	4	-	-	2	-	2
	Total	**16**	**18**	**-**	**16**	**9**	-	**25**

Course Code	Course Name	Examination Scheme							
		Internal Assesment							
		Internal Assesment			End Sem Exam	Exam Duration (in Hrs)	TW	oral	Total
		Test 1	Test 2	Avg					
CPC701	Digital Signal Processing	20	20	20	80	03	25	-	125
CPC702	Cryptography and System Security	20	20	20	80	03	25	25	150
CPC703	Artificial Intelligence	20	20	20	80	03	25	25	150
CPE7042X	Elective-II	20	20	20	80	03	25	25	150
CPP701	Project I	-	-	-	-	-	50	50	100
CPL701	Network Threats and Attacks Laboratory	-	-	-	-	-	25	50	75
	Total	**-**	**-**	**80**	**320**	-	**175**	**175**	**750**

Program Structure for B.E. Computer Engineering

Second Year (Computer) (Semester VIII)

(REV 2012)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract	Tut	Theory	TW/ Pract	Tut	Total
CPC801	Data Warehouse and Mining	4	2	-	4	1	-	5
CPC802	Human Machine Interaction	4	2	-	4	1	-	5
CPC803	Parallel and distributed Systems	4	2	-	4	1	-	5
CPE803X	Elective-III	4	2	-	4	1	-	5
CPP802	Project II	-	12 #	-	-	6	-	6
CPL801	Cloud Computing Laboratory	-	2	-	-	1	-	1
	Total	**16**	**22**	**-**	**16**	**11**	-	**27**

Course Code	Course Name	Examination Scheme							
		Internal Assesment							
		Internal Assesment			End Sem Exam	Exam Duration (in Hrs)	TW	oral	Tot
		Test 1	Test 2	Avg					
CPC801	Data Warehouse and Mining	20	20	20	80	03	25	25	150
CPC802	Human Machine Interaction	20	20	20	80	03	25	25	150
CPC803	Parallel and distributed Systems	20	20	20	80	03	25	25	150
CPE803X	Elective-III	20	20	20	80	03	25	25	150
CPP802	Project II	-	-	-	-	-	50	50	100
CPL801	Cloud Computing Laboratory	-	-	-	-	-	25	-	25
	Total			80	320		175	150	725

 # Indicate workload for Learner and not for Faculty in semester VII and VIII

Elective II Sem 7

System Group	**CPE7021**	Advance Algorithms
	CPE7022	Computer Simulation and Modeling
Electronics Group	**CPE7023**	Image Processing
Software Group	**CPE7024**	Software Architecture
	CPE7025	Soft Computing
DB Group	**CPE7026**	ERP and Supply Chain Management

Elective III - Sem 8

Electronics Group	**CPE8031**	Machine Learning
Digital Group	**CPE8032**	Embedded Systems
Network Group	**CPE8033**	Adhoc wireless networks
	CPE8034	Digital Forensic
DB Group	**CPE8035**	Big data Analytics