

Elective Subjects of B.E. Civil (2012 Pattern) for the A.Y. 2017-18

Savitribai Phule Pune University

Board of Studies in Civil Engineering

Structure for B.E. Civil 2012 Course (w.e.f. June 2015)

Semester – I									
Subject code	Subject	Teaching Scheme Hrs/Week			Examination Scheme				
		Lect	Tu	Pr	In-Semester Assessment	TW	Or	End - Semester Exam	Total
401 001	Environmental Engineering II	3		2	30	--	50	70	150
401 002	Transportation Engineering	3		2	30	50	--	70	150
401 003	Structural Design and Drawing III	4		2	30	--	50	70	150
401 004	Elective I	3		2	30	50		70	150
401 005	Elective II	3			30			70	100
401 006	Project Phase I	--	2			50			50
	Total →	16	2	8	150	150	100	350	750

Semester – II									
Subject code	Subject	Teaching Scheme Hrs/Week			Examination Scheme				
		Lect	Tu	Pr	In-Semester Assessment	TW	Or	End - Semester Exam	Total
401 007	Dams and Hydraulic Structures	3	--	2	30	---	50	70	150
401 008	Quantity Surveying, Contracts and Tenders	3	--	2	30	--	50	70	150
401 009	Elective III	3	--	2	30	50	--	70	150
401 010	Elective IV	3	--	2	30	50	--	70	150
401 006	Project	--	6		--	50	100	--	150
	Total →	12	6	8	120	150	200	280	750

Following will be the list of electives..

Semester I

Elective-I 401 004 1. Structural Design of Bridges 2. Systems Approach in Civil Engineering 3.. Advanced Concrete Technology 4. Architecture and Town Planning 5. Advanced Engineering Geology with Rock Mechanics	Elective-II 401 005 1. Matrix Methods of Structural Analysis 2. Integrated Water Resources and Planning 3. TQM & MIS in Civil Engineering 4. Earthquake Engineering 5. Advanced Geotechnical Engineering
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Semester II

Elective-III 401 009 1. Advanced Structural Design 2. Advanced Foundation Engineering 3. Hydropower Engineering 4. Air Pollution and control 5. Finite Element Method in Civil Engineering	Elective-IV 401 010 1 Construction Management 2. Advanced Transportation Engineering 3. Statistical Analysis and Computational Methods in Civil Engineering 4. Open Elective a). Plumbing Engineering b) Green Building Technology c) Ferrocement Technology d) Sub sea Engineering e) Wave Mechanics
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Elective Subjects of B.E. Civil (2012 Pattern) for the A.Y. 2016-17

Savitribai Phule Pune University

Board of Studies in Civil Engineering

Structure for B.E. Civil 2012 Course (w.e.f. June 2015)

Subject code	Subject	Semester – I							
		Teaching Scheme Hrs/Week			Examination Scheme				
		Lect	Tu	Pr	In-Semester Assessment	TW	Or	End - Semester Exam	Total
401 001	Environmental Engineering II	3		2	30	--	50	70	150
401 002	Transportation Engineering	3		2	30	50	--	70	150
401 003	Structural Design and Drawing III	4		2	30	--	50	70	150
401 004	Elective I	3		2	30	50		70	150
401 005	Elective II	3			30			70	100
401 006	Project Phase I	--	2			50			50
	Total →	16	2	8	150	150	100	350	750

Subject code	Subject	Semester – II							
		Teaching Scheme Hrs/Week			Examination Scheme				
		Lect	Tu	Pr	In-Semester Assessment	TW	Or	End - Semester Exam	Total
401 007	Dams and Hydraulic Structures	3	--	2	30	---	50	70	150
401 008	Quantity Surveying, Contracts and Tenders	3		2	30	--	50	70	150
401 009	Elective III	3	--	2	30	50	--	70	150
401 010	Elective IV	3	--	2	30	50	--	70	150
401 006	Project	--	6		--	50	100	--	150
	Total →	12	6	8	120	150	200	280	750

Following will be the list of electives..

Semester I

Elective-I 401 004 1. Structural Design of Bridges 2. Systems Approach in Civil Engineering 3. Advanced Concrete Technology 4. Architecture and Town Planning 5. Advanced Engineering Geology with Rock Mechanics	Elective-II 401 005 1. Matrix Methods of Structural Analysis 2. Integrated Water Resources and Planning 3. TQM & MIS in Civil Engineering 4. Earthquake Engineering 5. Advanced Geotechnical Engineering
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Semester II

Elective-III 401 009 1. Advanced Structural Design 2. Advanced Foundation Engineering 3. Hydropower Engineering 4. Air Pollution and control 5. Finite Element Method in Civil Engineering	Elective-IV 401 010 1. Construction Management 2. Advanced Transportation Engineering 3. Statistical Analysis and Computational Methods in Civil Engineering 4. Open Elective a). Plumbing Engineering b) Green Building Technology c) Ferrocement Technology d) Sub sea Engineering e) Wave Mechanics
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Savitribai Phule Pune University

Board of Studies in Civil Engineering

Structure for B.E. Civil 2012 Course (w.e.f. June 2015)

Subject code	Subject	Semester – I							
		Teaching Scheme Hrs/Week			Examination Scheme				
		Lect	Tu	Pr	In-Semester Assessment	TW	Or	End - Semester Exam	Total
401 001	Environmental Engineering II	3		2	30	--	50	70	150
401 002	Transportation Engineering	3		2	30	50	--	70	150
401 003	Structural Design and Drawing III	4		2	30	--	50	70	150
401 004	Elective I	3		2	30	50		70	150
401 005	Elective II	3			30			70	100
401 006	Project Phase I	--	2			50			50
	Total →	16	2	8	150	150	100	350	750

Subject code	Subject	Semester – II							
		Teaching Scheme Hrs/Week			Examination Scheme				
		Lect	Tu	Pr	In-Semester Assessment	TW	Or	End - Semester Exam	Total
401 007	Dams and Hydraulic Structures	3	--	2	30	---	50	70	150
401 008	Quantity Surveying, Contracts and Tenders	3	--	2	30	--	50	70	150
401 009	Elective III	3	--	2	30	50	--	70	150
401 010	Elective IV	3	--	2	30	50	--	70	150
401 006	Project	--	6		--	50	100	--	150
	Total →	12	6	8	120	150	200	280	750

Following will be the list of electives..

Semester I

Elective-I 401 004 1. Structural Design of Bridges 2. Systems Approach in Civil Engineering 3. Advanced Concrete Technology 4. Architecture and Town Planning 5. Advanced Engineering Geology with Rock Mechanics	Elective-II 401 005 1. Matrix Methods of Structural Analysis 2. Integrated Water Resources and Planning 3. TQM & MIS in Civil Engineering 4. Earthquake Engineering 5. Advanced Geotechnical Engineering
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Semester II

Elective-III 401 009 1. Advanced Structural Design 2. Advanced Foundation Engineering 3. Hydropower Engineering 4. Air Pollution and control 5. Finite Element Method in Civil Engineering	Elective-IV 401 010 1. Construction Management 2. Advanced Transportation Engineering 3. Statistical Analysis and Computational Methods in Civil Engineering 4. Open Elective a). Plumbing Engineering b) Green Building Technology c) Ferrocement Technology d) Sub sea Engineering e) Wave Mechanics
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Elective Subjects of B.E. Civil (2008 Pattern) for the A.Y. 2014-15

University of Pune

Structure of B.E. (Civil Engineering) 2008 Course (To be commenced w.e.f. July, 2011)

Semester I

Sub code No.	Subject Title	Teaching Scheme Hours per week			Examination Scheme				Total Marks
		Lect.	Tut.	Pract/ Drg	Paper	TW	Pract	Oral	
401001	Environmental Engineering-II	4	--	2	100	25	--	50	175
401002	Dams and Hydraulic Structures	4	--	2	100	25	--	50	175
401003	Structural Design-III	4	--	2	100 **	25	--	50	175
401004	Elective -I	4	--	2	100	25	--	--	125
401005	Elective -II	4	--	--	100	--	--	--	100
401006	Project Work	--	--	2	--	*	--	--	--
Total		20	--	10	500	100		150	750

* It is mandatory to present a seminar and submit report based on work of first semester.
hrs. duration

** Theory paper of 4

Semester II

Sub code No.	Subject Title	Teaching Scheme Hours per week			Examination Scheme				Total Marks
		Lect.	Tut.	Pract/ Drg	Paper	TW	Pract	Oral	
401007	Elective -III	4	--	2	100	25	--	--	125
401008	Elective-IV	4	--	--	100	--	--	--	100
401009	Quantity Surveying ,Contracts and Tenders	4	--	4	100 **	50	--	50	200
4010010	Transportation Engineering-II	4	--	2	100	25	--	50	175
401006	Project Work	--	--	6	--	100	--	50	150
Total		16	--	14	400	200		150	750

** Theory paper of 4 hrs. duration

Semester I

Elective-I 1. Structural Design of Bridges 2. Systems Approach in Civil Engineering 3. Air Pollution and Control 4. Architecture and Town Planning 5. Advanced Geotechnical Engineering	Elective-II 1. Matrix Methods of Structural Analysis 2. Hydroinformatics 3. TQM & MIS in Civil Engineering 4. Earthquake Engineering 5. Advanced Concrete Technology
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Semester II

Elective-III 1. Advanced Structural Design 2. Advanced Foundation Engineering 3. Advanced Engineering Geology with Rock Mechanics 4. Advanced Environmental Management 5. Construction Management	Elective-IV 1. Integrated Water Resources and Planning 2. Advanced Transportation Engineering 3. Statistical Analysis And Computational Methods in Civil Engg. 4. Open Elective Finite Element Method in civil engg. Geoinformatics Hydropower Engineering Industrial Waste Water Management
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Elective Subjects of B.E. Civil (2008 Pattern) for the A.Y. 2013-14

University of Pune

Structure of B.E. (Civil Engineering) 2008 Course (To be commenced w.e.f. July, 2011)

Semester I

Sub code No.	Subject Title	Teaching Scheme Hours per week			Examination Scheme				Total Marks
		Lect.	Tut.	Pract/ Drg	Paper	TW	Pract	Oral	
401001	Environmental Engineering-II	4	--	2	100	25	--	50	175
401002	Dams and Hydraulic Structures	4	--	2	100	25	--	50	175
401003	Structural Design-III	4	--	2	100 **	25	--	50	175
401004	Elective -I	4	--	2	100	25	--	--	125
401005	Elective -II	4	--	--	100	--	--	--	100
401006	Project Work	--	--	2	--	*	--	--	--
Total		20	--	10	500	100		150	750

* It is mandatory to present a seminar and submit report based on work of first semester.

** Theory paper of 4

hrs. duration

Semester II

Sub code No.	Subject Title	Teaching Scheme Hours per week			Examination Scheme				Total Marks
		Lect.	Tut.	Pract/ Drg	Paper	TW	Pract	Oral	
401007	Elective -III	4	--	2	100	25	--	--	125
401008	Elective-IV	4	--	--	100	--	--	--	100
401009	Quantity Surveying ,Contracts and Tenders	4	--	4	100 **	50	--	50	200
4010010	Transportation Engineering-II	4	--	2	100	25	--	50	175
401006	Project Work	--	--	6	--	100	--	50	150
Total		16	--	14	400	200		150	750

** Theory paper of 4 hrs. duration

Semester I

- Elective-I**
1. Structural Design of Bridges
 2. Systems Approach in Civil Engineering
 3. Air Pollution and Control
 4. Architecture and Town Planning
 5. Advanced Geotechnical Engineering

- Elective-II**
1. Matrix Methods of Structural Analysis
 2. Hydroinformatics
 3. TQM & MIS in Civil Engineering
 4. Earthquake Engineering
 5. Advanced Concrete Technology

Semester II

- Elective-III**
1. Advanced Structural Design
 2. Advanced Foundation Engineering
 3. Advanced Engineering Geology with Rock Mechanics
 4. Advanced Environmental Management
 5. Construction Management

- Elective-IV**
1. Integrated Water Resources and Planning
 2. Advanced Transportation Engineering
 3. Statistical Analysis And Computational Methods in Civil Engg.
 4. Open Elective
 - Finite Element Method in civil engg.
 - Geoinformatics
 - Hydropower Engineering
 - Industrial Waste Water Management

Elective Subjects of B.E. Computer (2012 Pattern) for the A.Y. 2017-18

**SAVITRIBAI PHULE PUNE UNIVERSITY
BE (COMPUTER ENGINEERING)- 2012 COURSE STRUCTURE**

Term-I

Subject Code	Subject	Teaching Scheme			Examination Scheme				Total Marks
		Lect	Tut	Pract	In Sem Asmnt	PR/TW	OR/TW	End Sem Asmnt	
410441	Design & Analysis of Algorithms	03	—	—	30	—	—	70	100
410442	Principles of Modern Compiler Design	04	—	—	30	—	—	70	100
410443	Smart System Design and Applications	03	—	—	30	—	—	70	100
410444	Elective-I	03	—	—	30	—	—	70	100
410445	Elective-II	03	—	—	30	—	—	70	100
410446	Computer laboratory-I	—	—	04	—	50	50	—	100
410447	Computer Laboratory-II	—	—	04	—	50	50	—	100
410448	Project	—	02	—	—	50	—	—	50
	Total	16	02	08	150	150	100	350	750
	Term-II								
410449	Software Design Methodologies & Testing	03	—	—	30	—	—	70	100
410450	High Performance Computing	03	—	—	30	—	—	70	100
410451	Elective-III	03	—	—	30	—	—	70	100
410452	Elective-IV Open Elective	03	—	—	30	—	—	70	100
410453	Computer laboratory-III	—	—	04	—	50	50	—	100
410454	Computer Laboratory-IV	—	—	04	—	50	50	—	100
410455	Project	—	06	—	—	50	100	—	150
	Total	12	06	08	120	150	200	280	750

Elective Subjects of B.E. Computer (2012 Pattern) for the A.Y. 2017-18

Electives:

Semester-I		Semester-II	
ELECTIVE-I		ELECTIVE-III	
1.	Image Processing	1.	Mobile Computing
2.	Computer Network Design and Modeling	2.	Web Technology
3.	Advanced Computer Programming	3.	Cloud Computing
4.	Data Mining Techniques and Applications	4.	Cyber Security
ELECTIVE-II		ELECTIVE-IV (Open Elective)	
1.	Problem Solving with Gamification	1.	Business Analytic and Intelligence
2.	Pervasive Computing	2.	Operations Research for Algorithms in Scientific Applications
3.	Embedded Security	3.	Mobile Applications
4.	Multidisciplinary NLP	4.	Open Elective

Open Elective: The listed open electives or any other Elective that is being taught in the current semester (semester-II) under the faculty of engineering or individual college and Industry can define new elective with complete (6 units) syllabus using defined framework of Elective IV and GET IT APPROVED FROM THE BOARD OF STUDIES (COMPUTER ENGINEERING) AND OTHER NECESSARY STATUTORY SYSTEMS IN THE SAVITRIBAI PHULE PUNE UNIVERSITY BEFORE 30th DECEMBER.

**SAVITRIBAI PHULE PUNE UNIVERSITY
BE (COMPUTER ENGINEERING)- 2012 COURSE STRUCTURE**

Term-I

Subject Code	Subject	Teaching Scheme			Examination Scheme				Total Marks
		Lect	Tut	Pract	In Sem Asmnt	PR/TW	OR/TW	End Sem Asmnt	
410441	Design & Analysis of Algorithms	03	—	—	30	—	—	70	100
410442	Principles of Modern Compiler Design	04	—	—	30	—	—	70	100
410443	Smart System Design and Applications	03	—	—	30	—	—	70	100
410444	Elective-I	03	—	—	30	—	—	70	100
410445	Elective-II	03	—	—	30	—	—	70	100
410446	Computer laboratory-I	—	—	04	—	50	50	—	100
410447	Computer Laboratory-II	—	—	04	—	50	50	—	100
410448	Project	—	02	—	—	50	—	—	50
	Total	16	02	08	150	150	100	350	750
	Term-II								
410449	Software Design Methodologies & Testing	03	—	—	30	—	—	70	100
410450	High Performance Computing	03	—	—	30	—	—	70	100
410451	Elective-III	03	—	—	30	—	—	70	100
410452	Elective-IV	03	—	—	30	—	—	70	100
	Open Elective								
410453	Computer laboratory-III	—	—	04	—	50	50	—	100
410454	Computer Laboratory-IV	—	—	04	—	50	50	—	100
410455	Project	—	06	—	—	50	100	—	150
	Total	12	06	08	120	150	200	280	750

Elective Subjects of B.E. Computer (2012 Pattern) for the A.Y. 2016-17

Electives:

Semester-I		Semester-II	
ELECTIVE-I		ELECTIVE-III	
1.	Image Processing	1.	Mobile Computing
2.	Computer Network Design and Modeling	2.	Web Technology
3.	Advanced Computer Programming	3.	Cloud Computing
4.	Data Mining Techniques and Applications	4.	Cyber Security
ELECTIVE-II		ELECTIVE-IV (Open Elective)	
1.	Problem Solving with Gamification	1.	Business Analytic and Intelligence
2.	Pervasive Computing	2.	Operations Research for Algorithms in Scientific Applications
3.	Embedded Security	3.	Mobile Applications
4.	Multidisciplinary NLP	4.	Open Elective

Open Elective: The listed open electives or any other Elective that is being taught in the current semester (semester-II) under the faculty of engineering or individual college and Industry can define new elective with complete (6 units) syllabus using defined framework of Elective IV and GET IT APPROVED FROM THE BOARD OF STUDIES (COMPUTER ENGINEERING) AND OTHER NECESSARY STATUTORY SYSTEMS IN THE SAVITRIBAI PHULE PUNE UNIVERSITY BEFORE 30th DECEMBER.

SAVITRIBAI PHULE PUNE UNIVERSITY
BE (COMPUTER ENGINEERING)- 2012 COURSE STRUCTURE

Term-I

Subject Code	Subject	Teaching Scheme			Examination Scheme				Total Marks
		Lect	Tut	Pract	In Sem Asmnt	PR/TW	OR/TW	End Sem Asmnt	
410441	Design & Analysis of Algorithms	03	—	—	30	—	—	70	100
410442	Principles of Modern Compiler Design	04	—	—	30	—	—	70	100
410443	Smart System Design and Applications	03	—	—	30	—	—	70	100
410444	Elective-I	03	—	—	30	—	—	70	100
410445	Elective-II	03	—	—	30	—	—	70	100
410446	Computer laboratory-I	—	—	04	—	50	50	—	100
410447	Computer Laboratory-II	—	—	04	—	50	50	—	100
410448	Project	—	02	—	—	50	—	—	50
	Total	16	02	08	150	150	100	350	750
	Term-II								
410449	Software Design Methodologies & Testing	03	—	—	30	—	—	70	100
410450	High Performance Computing	03	—	—	30	—	—	70	100
410451	Elective-III	03	—	—	30	—	—	70	100
410452	Elective-IV Open Elective	03	—	—	30	—	—	70	100
410453	Computer laboratory-III	—	—	04	—	50	50	—	100
410454	Computer Laboratory-IV	—	—	04	—	50	50	—	100
410455	Project	—	06	—	—	50	100	—	150
	Total	12	06	08	120	150	200	280	750

Elective Subjects of B.E. Computer (2012 Pattern) for the A.Y. 2015-16

Electives:

Semester-I		Semester-II	
ELECTIVE-I		ELECTIVE-III	
1.	Image Processing	1.	Mobile Computing
2.	Computer Network Design and Modeling	2.	Web Technology
3.	Advanced Computer Programming	3.	Cloud Computing
4.	Data Mining Techniques and Applications	4.	Cyber Security
ELECTIVE-II		ELECTIVE-IV (Open Elective)	
1.	Problem Solving with Gamification	1.	Business Analytic and Intelligence
2.	Pervasive Computing	2.	Operations Research for Algorithms in Scientific Applications
3.	Embedded Security	3.	Mobile Applications
4.	Multidisciplinary NLP	4.	Open Elective

Open Elective: The listed open electives or any other Elective that is being taught in the current semester (semester-II) under the faculty of engineering or individual college and Industry can define new elective with complete (6 units) syllabus using defined framework of Elective IV and GET IT APPROVED FROM THE BOARD OF STUDIES (COMPUTER ENGINEERING) AND OTHER NECESSARY STATUTORY SYSTEMS IN THE SAVITRIBAI PHULE PUNE UNIVERSITY BEFORE 30th DECEMBER.

BE (COMPUTER ENGINEERING)- 2008 COURSE STRUCTURE

Term-I

Subject Code	Subject	Teaching Scheme		Examination Scheme				Total Marks
		Lect.	Pract.	Th	TW	Pr	Or	
410441	Design & Analysis of Algorithms	04		100		—		100
410442	Principles of Compiler Design	04	—	100	—	—	—	100
410443	Object Oriented Modeling & Design	04	02	100	25	—	50	175
410444	Elective-I	03	02	100	25	—	50	175
410445	Elective-II	03		100	—	—	—	100
410446	Computer Laboratory-I	—	04	—	—	50	—	050
410447	Project Work	—	02	—	50	—	—	050
	Total	18	10	500	100	50	100	750
	Total of Part I (A)	28 Hrs		750				

Term II

Subject Code	Subject	Teaching Scheme		Examination Scheme				Total Marks
		Lect.	Pract	Th	TW	Pr	Or	
410448	Distributed Operating Systems	04	—	100	—	—	—	100
410449	Advanced Computer Architecture	04		100				100
410450	Elective-III	04	02	100	50	—	50	200
410451	Elective-IV	04	—	100	—	—	—	100
410452	Computer Laboratory II	—	04	—	50	50	—	100
410447	Project Work	—	06	—	100	—	50	150
	Total	16	12	400	200	50	100	750
	Total of Part II (B)	28 Hrs		750				
	Grand Total (A+B)			1500				

Th: Theory TW: Term Work

Pr: Practical Or: Oral

Elective I

- 1) Image Processing
- 2) Design & Analysis of Computer Networks
- 3) Artificial Intelligence
- 4) Software Architecture

Elective III

- 1) Pattern Recognition
- 2) High Performance networks
- 3) Neural Networks
- 4) Advanced Databases

Elective II

- 1) Multimedia Systems
- 2) Mobile Computing
- 3) Embedded Systems
- 4) Software Testing & Quality Assurance

Elective IV

- 1) VLSI & Digital System Design
 - 2) Operations Research
 - 3) Cloud Computing
 - 4) Information Security
- or Open Elective

Open Elective: Any other Electives that are being taught in Term II under the Faculty of Engineering or individual college and Industry, together, can define new elective using framework of Elective IV defined in syllabus structure and GET IT APPROVED FROM BOARD OF STUDIES COMPUTER ENGINEERING AND OTHER NECESSARY STATUTORY SYSTEMS IN THE UNIVERSITY OF PUNE BEFORE 30th DECEMBER.

The BE Project Term work assessment for Term I will be done by selecting panel of examiners amongst senior teachers of Computer Engineering. Existing prevailing practices are followed for all remaining examinations and assessment work.

Elective Subjects of B.E. Computer (2008 Pattern) for the A.Y. 2013-14

BE (COMPUTER ENGINEERING)- 2008 COURSE STRUCTURE

Term-I

Subject Code	Subject	Teaching Scheme		Examination Scheme				Total Marks
		Lect.	Pract.	Th	TW	Pr	Or	
410441	Design & Analysis of Algorithms	04		100		—		100
410442	Principles of Compiler Design	04	—	100	—	—	—	100
410443	Object Oriented Modeling & Design	04	02	100	25	—	50	175
410444	Elective-I	03	02	100	25	—	50	175
410445	Elective-II	03		100	----	—	---	100
410446	Computer Laboratory-I	—	04	—	----	50	—	050
410447	Project Work	---	02	---	50	---	---	050
	Total	18	10	500	100	50	100	750
	Total of Part I (A)	28 Hrs		750				

Term II

Subject Code	Subject	Teaching Scheme		Examination Scheme				Total Marks
		Lect.	Pract	Th	TW	Pr	Or	
410448	Distributed Operating Systems	04	—	100	—	—	—	100
410449	Advanced Computer Architecture	04		100				100
410450	Elective-III	04	02	100	50	—	50	200
410451	Elective-IV	04	---	100	---	—	---	100
410452	Computer Laboratory II	—	04	---	50	50	—	100
410447	Project Work	—	06	—	100	—	50	150
	Total	16	12	400	200	50	100	750
	Total of Part II (B)	28 Hrs		750				
	Grand Total (A+B)			1500				

Th: Theory TW: Term Work

Pr: Practical Or: Oral

Elective Subjects of B.E. Computer (2008 Pattern) for the A.Y. 2013-14

Elective I

- 1) Image Processing
- 2) Design & Analysis of Computer Networks
- 3) Artificial Intelligence
- 4) Software Architecture

Elective III

- 1) Pattern Recognition
- 2) High Performance networks
- 3) Neural Networks
- 4) Advanced Databases

Elective II

- 1) Multimedia Systems
- 2) Mobile Computing
- 3) Embedded Systems
- 4) Software Testing & Quality Assurance

Elective IV

- 1) VLSI & Digital System Design
 - 2) Operations Research
 - 3) Cloud Computing
 - 4) Information Security
- or Open Elective

Open Elective: Any other Electives that are being taught in Term II under the Faculty of Engineering or individual college and Industry, together, can define new elective using framework of Elective IV defined in syllabus structure and GET IT APPROVED FROM BOARD OF STUDIES COMPUTER ENGINEERING AND OTHER NECESSARY STATUTORY SYSTEMS IN THE UNIVERSITY OF PUNE BEFORE 30th DECEMBER.

The BE Project Term work assessment for Term I will be done by selecting panel of examiners amongst senior teachers of Computer Engineering. Existing prevailing practices are followed for all remaining examinations and assessment work.

BE (E & TC) Structure
2012 Course w.e.f. June 2015

Semester-I

Subject Code	Subject	Teaching Scheme			Examination Scheme					Marks
		LECT	TUT	PR	In Semester Assessment Phase I	PR	OR	TW	End Semester Examination	Total
									Phase II	
404181	VLSI Design & Technology	3			30					100
404182	Computer Networks	3			30				70	100
404183	Microwave Engineering	4			30				70	100
404184	Elective I	3			30				70	100
404185	Elective II	3			30				70	100
404186	Lab Practice I (CN & MWE)			4			50	50		100
404187	Lab Practice II (VLSI & Elective I)			4		50		50		100
404188	Project Phase I		2				50			50
	Total	16	2	8	150	50	100	100	350	750

Elective I

1. Digital Image Processing
2. Embedded Systems & RTOS
3. Software Defined Radio
4. Industrial Drives and Control

Elective II

1. Multi rate & Adaptive Signal Processing
2. Electronic Product Design
3. PLCs and Automation
4. Artificial Intelligence

Elective Subjects of B.E. E&TC (2012 Pattern) for the A.Y. 2017-18

Semester-II

Subject Code	Subject	Teaching Scheme			Examination Scheme					Marks Total
		LECT	TUT	PR	In Semester Assessment	PR	OR	TW	End Semester Examination	
					Phase I				Phase II	
404189	Mobile Communication	4			30				70	100
404190	Broadband Communication Systems	4			30				70	100
404191	Elective III	3			30				70	100
404192	Elective IV	3			30				70	100
404193	Lab Practice III(MC & BCS)			4			50	50		100
404194	Lab Practice IV(Elective III)			2		50		50		100
404195	Project Phase II		6			50		100		150
	Total	14	6	6	120	100	50	200	280	750

Elective III

1. Speech & Audio Signal Processing
2. RF Circuit Design
3. Audio Video Engineering
4. Soft Computing

Elective IV

1. Biomedical Signal Processing
2. Nano Electronics & MEMS
3. Detection & Estimation Theory
4. Wireless Networks
5. Open Elective*

*Any one subject from the list of Elective IV of computer/IT/Electrical/Instrumentation or Institute can offer elective IV based on any industry need with prior approval from BoS(Electronics). Repetition of subjects or topics is to be avoided.

Dr. D. S. Bormane
Chairman, BOS(Electronics)

BE (E & TC) Structure

2012 Course w.e.f. June 2015

Semester-I

Subject Code	Subject	Teaching Scheme			Examination Scheme					Marks Total
		LECT	TUT	PR	In Semester Assessment	PR	OR	TW	End Semester Examination	
					Phase I				Phase II	
404181	VLSI Design & Technology	3			30				70	100
404182	Computer Networks	3			30				70	100
404183	Microwave Engineering	4			30				70	100
404184	Elective I	3			30				70	100
404185	Elective II	3			30				70	100
404186	Lab Practice I (CN & MWE)			4			50	50		100
404187	Lab Practice II (VLSI & Elective I)			4		50		50		100
404188	Project Phase I		2				50			50
	Total	16	2	8	150	50	100	100	350	750

Elective I

1. Digital Image Processing
2. Embedded Systems & RTOS
3. Software Defined Radio
4. Industrial Drives and Control

Elective II

1. Multi rate & Adaptive Signal Processing
2. Electronic Product Design
3. PLCs and Automation
4. Artificial Intelligence

Semester-II

Subject Code	Subject	Teaching Scheme			Examination Scheme					Marks Total
		LECT	TUT	PR	In Semester Assessment	PR	OR	TW	End Semester Examination	
					Phase I				Phase II	
404189	Mobile Communication	4			30				70	100
404190	Broadband Communication Systems	4			30				70	100
404191	Elective III	3			30				70	100
404192	Elective IV	3			30				70	100
404193	Lab Practice III(MC & BCS)			4			50	50		100
404194	Lab Practice IV(Elective III)			2		50		50		100
404195	Project Phase II		6			50		100		150
	Total	14	6	6	120	100	50	200	280	750

Elective III

1. Speech & Audio Signal Processing
2. RF Circuit Design
3. Audio Video Engineering
4. Soft Computing

Elective IV

1. Biomedical Signal Processing
2. Nano Electronics & MEMS
3. Detection & Estimation Theory
4. Wireless Networks
5. Open Elective*

*Any one subject from the list of Elective IV of computer/IT/Electrical/Instrumentation or Institute can offer elective IV based on any industry need with prior approval from BoS(Electronics). Repetition of subjects or topics is to be avoided.

Dr. D. S. Bormane
Chairman, BOS(Electronics)

BE (E & TC) Structure**2012 Course w.e.f. June 2015****Semester-I**

Subject Code	Subject	Teaching Scheme			Examination Scheme					Marks
		LECT	TUT	PR	In Semester Assessment	PR	OR	TW	End Semester Examination	Total
					Phase I				Phase II	
404181	VLSI Design & Technology	3			30				70	100
404182	Computer Networks	3			30				70	100
404183	Microwave Engineering	4			30				70	100
404184	Elective I	3			30				70	100
404185	Elective II	3			30				70	100
404186	Lab Practice I (CN & MWE)			4			50	50		100
404187	Lab Practice II (VLSI & Elective I)			4		50		50		100
404188	Project Phase I		2				50			50
	Total	16	2	8	150	50	100	100	350	750

Elective I

1. Digital Image Processing
2. Embedded Systems & RTOS
3. Software Defined Radio
4. Industrial Drives and Control

Elective II

1. Multi rate & Adaptive Signal Processing
2. Electronic Product Design
3. PLCs and Automation
4. Artificial Intelligence

Elective Subjects of B.E. E&TC (2012 Pattern) for the A.Y. 2015-16

Semester-II

Subject Code	Subject	Teaching Scheme			Examination Scheme					Marks
		LECT	TUT	PR	In Semester Assessment	PR	OR	TW	End Semester Examination	Total
					Phase I				Phase II	
404189	Mobile Communication	4			30				70	100
404190	Broadband Communication Systems	4			30				70	100
404191	Elective III	3			30				70	100
404192	Elective IV	3			30				70	100
404193	Lab Practice III(MC & BCS)			4			50	50		100
404194	Lab Practice IV(Elective III)			2		50		50		100
404195	Project Phase II		6			50		100		150
	Total	14	6	6	120	100	50	200	280	750

Elective III

1. Speech & Audio Signal Processing
2. RF Circuit Design
3. Audio Video Engineering
4. Soft Computing

Elective IV

1. Biomedical Signal Processing
2. Nano Electronics & MEMS
3. Detection & Estimation Theory
4. Wireless Networks
5. Open Elective*

*Any one subject from the list of Elective IV of computer/IT/Electrical/Instrumentation or Institute can offer elective IV based on any industry need with prior approval from BoS(Electronics). Repetition of subjects or topics is to be avoided.

Dr. D. S. Bormane
Chairman, BOS(Electronics)

STRUCTURE OF

B.E. (ELECTRONICS & TELECOMMUNICATIONS) 2008 COURSE

TERM - I

SUBJECT CODE	NAME OF SUBJECT	TH	PR	TUT	PP	TW	OR	PR	TOTAL MARKS
404181	ELECTRONICS PRODUCT DESIGN	3		1	100	25			125
404182	VLSI DESIGN & TECHNOLOGY	4	2		100			50	150
404183	COMPUTER NETWORK	4	2		100		50		150
404184	ELECTIVE-I	4	2		100	25		50	175
404185	ELECTIVE-II	4			100				100
404186	PROJECT (PART-1)		2			50			50
		19	8	1	500	100	50	100	750

Elective –I

1. Digital Image Processing
2. Embedded System and RTOS
3. Industrial Drives Control
4. Microwave Communication and Radar

Elective-II

1. Entrepreneurship Development
2. Joint Time Frequency Analysis
3. Micro-electromechanical-system and System on chip (MEMS and SOC)
4. Mobile Communication

TERM – II

SUBJECT CODE	NAME OF SUBJECT	TH	PR	TUT	PP	TW	OR	PR	TOTAL MARKS
404187	TELECOMMUNICATION & SWITCHING SYSTEM	4	2	1	100		50		150
404188	OPTICAL FIBER COMMUNICATION	4	2		100	25		50	175
404189	ELECTIVE-III	4	2		100	25		50	175
404190	ELECTIVE-IV	4			100				100
404191	PROJECT (PART-II)***		6			100	50		150
		16	12	0	400	150	100	100	750

Elective-III

1. Soft Computing
2. Speech Processing
3. Television and Video Engineering
4. Test and Measurement Systems

Elective-IV

1. Artificial intelligence
2. Automotive Electronics
3. Nanotechnology
4. PLC and Industrial Process Automation
5. Any one subject from the list of Elective IV of Computer/IT/Electrical/Instrumentation OR institute can offer an elective-IV based on any industry need with prior approval of BOS (Electronics)

Note:

- 1) All Theory papers are three hours duration
- 2) Practical/Oral shall be based on term-work
- 3) Term-work of Project Part I consist of project report based on project
- 4) * * * Exam at the end of II term

Elective Subjects of B.E. E&TC (2008 Pattern) for the A.Y. 2013-14

STRUCTURE OF

B.E. (ELECTRONICS & TELECOMMUNICATIONS) 2008 COURSE

TERM - I

SUBJECT CODE	NAME OF SUBJECT	TH	PR	TUT	PP	TW	OR	PR	TOTAL MARKS
404181	ELECTRONICS PRODUCT DESIGN	3		1	100	25			125
404182	VLSI DESIGN & TECHNOLOGY	4	2		100			50	150
404183	COMPUTER NETWORK	4	2		100		50		150
404184	ELECTIVE-I	4	2		100	25		50	175
404185	ELECTIVE-II	4			100				100
404186	PROJECT (PART-1)		2			50			50
		19	8	1	500	100	50	100	750

Elective -I

1. Digital Image Processing
2. Embedded System and RTOS
3. Industrial Drives Control
4. Microwave Communication and Radar

Elective-II

1. Entrepreneurship Development
2. Joint Time Frequency Analysis
3. Micro-electromechanical-system and System on chip (MEMS and SOC)
4. Mobile Communication

Elective Subjects of B.E. E&TC (2008 Pattern) for the A.Y. 2013-14

TERM – II

SUBJECT CODE	NAME OF SUBJECT	TH	PR	TUT	PP	TW	OR	PR	TOTAL MARKS
404187	TELECOMMUNICATION & SWITCHING SYSTEM	4	2	1	100		50		150
404188	OPTICAL FIBER COMMUNICATION	4	2		100	25		50	175
404189	ELECTIVE-III	4	2		100	25		50	175
404190	ELECTIVE-IV	4			100				100
404191	PROJECT (PART-II)***		6			100	50		150
		16	12	0	400	150	100	100	750

Elective-III

1. Soft Computing
2. Speech Processing
3. Television and Video Engineering
4. Test and Measurement Systems

Elective-IV

1. Artificial intelligence
2. Automotive Electronics
3. Nanotechnology
4. PLC and Industrial Process Automation
5. Any one subject from the list of Elective IV of Computer/IT/Electrical/Instrumentation OR institute can offer an elective-IV based on any industry need with prior approval of BOS (Electronics)

Note:

- 1) All Theory papers are three hours duration
- 2) Practical/Oral shall be based on term-work
- 3) Term-work of Project Part I consist of project report based on project
- 4) ** * Exam at the end of II term

Savitribai Phule Pune University, Pune 2012 Course

B. E. (Mechanical) Semester – I

(w. e. f. Academic year 2015 -16)

Code	Subject	Teaching Scheme (Weekly Load in hrs)			Examination Scheme(Marks)					
		Lect.	Tut	Practical	In-Sem	End-Sem	TW	PR ⁺	OR ⁺	Total
402041	Refrigeration and Air Conditioning	3	--	2	30	70	25	--	50	175
402042	CAD/ CAM Automation	3	--	2	30	70	--	50	--	150
402043	Dynamics of Machinery	4	--	2	30	70	25	--	50	175
402044	Elective – I	3	--	--	30	70	--	--	--	100
402045	Elective – II	3	--	--	30	70	--	--	--	100
402046	Project – I	--	2	--	--	--	50*	--	--	50
Total of Semester – I		16	2	6	150	350	100	50	100	750

B. E. (Mechanical) Semester – II

Code	Subject	Teaching Scheme (Weekly Load in hrs)			Examination Scheme(Marks)					
		Lect.	Tut	Practical	In-Sem	End-Sem	TW	PR ⁺	OR ⁺	Total
402047	Power Plant Engineering	4	--	2	30	70	25	--	50	175
402048	Mechanical System Design	4	--	2	30	70	--	--	50	150
402049	Elective-III	4	--	--	30	70	--	--	--	100
402050	Elective-IV	4	--	2	30	70	25	--	--	125
402051	Project – II	--	6	--	--	--	150	--	50	200
Total of Semester – II		16	6	6	120	280	200	--	150	750

+ For all Oral/Practical heads: Examination will be based on term work and Theory Subject

* Assessment should be carried out by panel of examiners from same Institute

Elective-I		Elective-II	
Code	Subject	Code	Subject
402044 A	Energy Audit Management	402045 A	Gas Turbine Propulsion
402044 B	Tribology	402045 B	Product Design and Development
402044 C	Reliability Engineering	402045 C	Operation Research
402044 D	Machine Tool Design	402045 D	Advanced Manufacturing Processes
Elective-III		Elective-IV	
Code	Subject	Code	Subject
402049 A	Refrigeration and Air Conditioning Equipment Design	402050 A	Computational Fluid Dynamics
402049 B	Robotics	402050 B	Finite Element Analysis
402049 C	Industrial Engineering	402050 C	Design of Pumps, Blowers and Compressors
402049 D	Open Elective **		

** : Open Elective – Board of studies (BoS) - Mechanical will declare the list of subjects which can be taken under open electives or any other Electives that are being taught in the current semester, to the same level, as Elective – III under engineering faculty or individual college and Industry can define new elective with proper syllabus using defined framework of Elective III and GET IT APPROVED FROM BOARD OF STUDIES AND OTHER NECESSARY STATUTORY SYSTEMS IN THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE, BEFORE 30th NOVEMBER. Without approval from University statutory system, no one can introduce the open elective in curriculum.

B. E. (Mechanical) Semester – I

(w. e. f. Academic year 2015 - 16)

Code	Subject	Teaching Scheme (Weekly Load in hrs)			Examination Scheme(Marks)					
		Lect.	Tut	Practical	In-Sem	End-Sem	TW	PR ⁺	OR ⁺	Total
402041	Refrigeration and Air Conditioning	3	--	2	30	70	25	--	50	175
402042	CAD/ CAM Automation	3	--	2	30	70	--	50	--	150
402043	Dynamics of Machinery	4	--	2	30	70	25	--	50	175
402044	Elective – I	3	--	--	30	70	--	--	--	100
402045	Elective –II	3	--	--	30	70	--	--	--	100
402046	Project –I	--	2	--	--	--	50*	--	--	50
Total of Semester – I		16	2	6	150	350	100	50	100	750

B. E. (Mechanical) Semester – II

Code	Subject	Teaching Scheme (Weekly Load in hrs)			Examination Scheme(Marks)					
		Lect.	Tut	Practical	In-Sem	End-Sem	TW	PR ⁺	OR ⁺	Total
402047	Power Plant Engineering	4	--	2	30	70	25	--	50	175
402048	Mechanical System Design	4	--	2	30	70	--	--	50	150
402049	Elective-III	4	--	--	30	70	--	--	--	100
402050	Elective-IV	4	--	2	30	70	25	--	--	125
402051	Project – II	--	6	--	--	--	150	--	50	200
Total of Semester – II		16	6	6	120	280	200	--	150	750

+ For all Oral/Practical heads: Examination will be based on term work and Theory Subject

* Assessment should be carried out by panel of examiners from same Institute

Elective-I		Elective-II	
Code	Subject	Code	Subject
402044 A	Energy Audit Management	402045 A	Gas Turbine Propulsion
402044 B	Tribology	402045 B	Product Design and Development
402044 C	Reliability Engineering	402045 C	Operation Research
402044 D	Machine Tool Design	402045 D	Advanced Manufacturing Processes
Elective-III		Elective-IV	
Code	Subject	Code	Subject
402049 A	Refrigeration and Air Conditioning Equipment Design	402050 A	Computational Fluid Dynamics
402049 B	Robotics	402050 B	Finite Element Analysis
402049 C	Industrial Engineering	402050 C	Design of Pumps, Blowers and Compressors
402049 D	Open Elective **		

** : Open Elective – Board of studies (BoS) - Mechanical will declare the list of subjects which can be taken under open electives or any other Electives that are being taught in the current semester, to the same level, as Elective – III under engineering faculty or individual college and Industry can define new elective with proper syllabus using defined framework of Elective III and GET IT APPROVED FROM BOARD OF STUDIES AND OTHER NECESSARY STATUTORY SYSTEMS IN THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE, BEFORE 30th NOVEMBER. Without approval from University statutory system, no one can introduce the open elective in curriculum.

Savitribai Phule Pune University, Pune 2012 Course

B. E. (Mechanical) Semester – I

(w. e. f. Academic year 2015 - 16)

Code	Subject	Teaching Scheme (Weekly Load in hrs)			Examination Scheme(Marks)					
		Lect.	Tut	Practical	In-Sem	End-Sem	TW	PR ⁺	OR ⁺	Total
402041	Refrigeration and Air Conditioning	3	--	2	30	70	25	--	50	175
402042	CAD/ CAM Automation	3	--	2	30	70	--	50	--	150
402043	Dynamics of Machinery	4	--	2	30	70	25	--	50	175
402044	Elective – I	3	--	--	30	70	--	--	--	100
402045	Elective –II	3	--	--	30	70	--	--	--	100
402046	Project –I	--	2	--	--	--	50*	--	--	50
Total of Semester – I		16	2	6	150	350	100	50	100	750

B. E. (Mechanical) Semester – II

Code	Subject	Teaching Scheme (Weekly Load in hrs)			Examination Scheme(Marks)					
		Lect.	Tut	Practical	In-Sem	End-Sem	TW	PR ⁺	OR ⁺	Total
402047	Power Plant Engineering	4	--	2	30	70	25	--	50	175
402048	Mechanical System Design	4	--	2	30	70	--	--	50	150
402049	Elective-III	4	--	--	30	70	--	--	--	100
402050	Elective-IV	4	--	2	30	70	25	--	--	125
402051	Project – II	--	6	--	--	--	150	--	50	200
Total of Semester – II		16	6	6	120	280	200	--	150	750

+ For all Oral/Practical heads: Examination will be based on term work and Theory Subject

* Assessment should be carried out by panel of examiners from same Institute

Elective-I		Elective-II	
Code	Subject	Code	Subject
402044 A	Energy Audit Management	402045 A	Gas Turbine Propulsion
402044 B	Tribology	402045 B	Product Design and Development
402044 C	Reliability Engineering	402045 C	Operation Research
402044 D	Machine Tool Design	402045 D	Advanced Manufacturing Processes
Elective-III		Elective-IV	
Code	Subject	Code	Subject
402049 A	Refrigeration and Air Conditioning Equipment Design	402050 A	Computational Fluid Dynamics
402049 B	Robotics	402050 B	Finite Element Analysis
402049 C	Industrial Engineering	402050 C	Design of Pumps, Blowers and Compressors
402049 D	Open Elective **		

** : Open Elective – Board of studies (BoS) - Mechanical will declare the list of subjects which can be taken under open electives or any other Electives that are being taught in the current semester, to the same level, as Elective – III under engineering faculty or individual college and Industry can define new elective with proper syllabus using defined framework of Elective III and GET IT APPROVED FROM BOARD OF STUDIES AND OTHER NECESSARY STATUTORY SYSTEMS IN THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE, BEFORE 30th NOVEMBER. Without approval from University statutory system, no one can introduce the open elective in curriculum.

University of Pune, Pune

B. E. (Mechanical) Structure (2008 Course)

With effect from June 2011

Code	Subject	Teaching Scheme		Examination Scheme				
		L	P/D	P	TW	Or	Pr	Total
Semester I								
402041	CAD/CAM Automation	4	2	100	25	--	50	175
402042	Dynamics of Machinery	4	2	100	25	50		175
402043	Industrial Fluid Power	4	2	100	25	50		175
402044	Elective I ***	4	2	100	25			125
402045	Elective II	4		100				100
402046 A	Project Work		2					
Total of Semester I		20	10	500	100	100	50	750
Semester II								
402046 B	Project Work		6		100	50		150
402047	Power Plant Engineering	4	2	100	25	50		175
402048	Mechanical System Design **	4	2	100	25	50		175
402049	Elective III ***	4	2	100	50			150
402050	Elective IV	4		100				100
Total of Semester II		16	12	400	200	150		750

** Theory paper of 4 hours duration

*** The term work marks shall be based on assignments / seminar as prescribed by subject syllabus.

*** 402050D Open Elective – BoS Mechanical will declare the list of subjects which can be taken under open electives or any other Electives that are being taught in the current semester as Elective – IV under engineering faculty or individual college and Industry can define new elective with proper syllabus using defined framework of Elective IV and GET IT APPROVED FROM BOARD OF STUDIES AND OTHER NECESSARY STATUTORY SYSTEMS IN THE UNIVERSITY OF PUNE BEFORE 30th DECEMBER.

Elective I

- 402044 A Energy Audit and Management
- 402044 B Product Design and Development
- 402044 C Design of Pumps, Blowers and Compressors
- 402044 D Tribology

Elective II

- 402045 A Automobile Engineering
- 402045 B Machine Tool Design
- 402045 C Quantitative and decision making Techniques

Elective III

- 402049 A Computational Fluid Dynamics
- 402049 B Finite Element Method
- 402049 C Robotics
- 402049 D Advanced Air Conditioning and Refrigeration

Elective IV

- 402050 A Industrial Heat Transfer Equipments
- 402050 B Management Information System
- 402050 C Reliability Engineering
- 402050 D Open Elective

Legend: L Lecture
P/D Practical/ Drawing
P Paper

TW Term work
Or Oral
Pr Practical

Dean, Faculty of Engineering

Chairman, BOS
Mechanical Engineering

Elective Subjects of B.E. Mechanical (2008 Pattern) for the A.Y. 2013-14

B.E. Mechanical 2008 Structure (w.e.f. June – 2011)

FIRST TERM

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME				
		Lect.	Pract/Dwg	Paper	TW	Oral	Pr	Total
402041	CAD/CAM Automation	4	2	100	25	50	-	175
402042	Dynamics of Machinery	4	2	100	25	50	-	175
402043	Industrial Fluid Power	4	2	100	25	50	-	175
402044	Elective I ***	4	-	100	25	-	-	125
402045	Elective II	4	-	100	-	-	-	100
402046	Project Work	-	2	-	-	-	-	-
Total of First Term		20	8	500	100	150	-	750

SECOND TERM

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME				
		Lect.	Pract/Dwg	Paper	TW	Oral	Pr	Total
402046	Project Work	-	6	-	100	50	-	150
402047	Power Plant Engineering	4	2	100	25	50	-	175
402048	Mechanical System Design**	4	2	100	25	50	-	175
402049	Elective III	4	2	100	50	-	-	150
402050	Elective IV	4	-	100	-	-	-	100
Total of Second Term		16	12	400	200	150	-	750

** Theory paper of 4 Hours duration

*** The Term Work marks will be based on the Assignments / Seminar as prescribed by subject syllabus

**** Open Elective Subject- BOS Mechanical will declare the list of subjects which can be taken under open elective..

Elective 1		Elective 2	
402044A	Energy Audit & Management	402045A	Automobile Engineering
402044B	Product Design & Development	402045B	Machine Tool Design

402044C	Theory & Design of Pumps, Blowers and Compressors	402045C	Quantitative & Decision Making Techniques
402044D	Tribology	402045D	Open Elective Subject (self study)****

Elective 3		Elective 4	
402049A	Computational Fluid Dynamics	402050A	Industrial Heat Transfer Equipment
402049B	Finite Element Method	402050B	Management Information System
402049C	Robotics	402050C	Reliability Engineering
402049D	Advance Air-conditioning & Refrigeration	402050D	Open Elective Subject (self study)****