



Jayawant Shikshan Prasarak Mandal's  
**JSPM Narhe Technical Campus**

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B.E.(Civil),M.E.(Env.Engg.),Ph.D(Engg.)  
DIRECTOR

Date: 29/10/2018

To

The Coordinator,

NAAC, Bengaluru

Subject: Proof of courses integrating cross cutting issues

Reference: 1.3.1 Institution integrates cross cutting issues relevant to Gender, Environment and sustainability, Human Values and Professional Ethics in to the Curriculum

Dear Sir/Madam,

The courses integrating cross cutting issues mentioned in the reference above are available along with syllabus structure in the link given below.

<http://jspmntc.edu.in/Criteria-I/pdf/C1/1.3.1.pdf>

Dr. Director  
J.S.P.M. Narhe, Technical Campus  
Narhe Pune-41



Enclosure:

1. Sample syllabus structure

**University of Pune**  
**Board of Studies(Civill Engineering)**  
**TE Civil (2012 Course) w.e.f.June ,2014**

Semester – I								
Subject code	Subject	Teaching Scheme Hrs/Week			Examination Scheme			
		Lect	Pr	In-Semester Assessment	Pr/TW	Or	End - Semester Exam	Total
301 001	Hydrology and Water Resources Engineering	3	-	30			70	100
301 002	Infrastructure Engineering	3	-	30			70	100
301 003	Structural Design I	4	4	30	50	50	70	200
301 004	Structural Analysis II	4	-	30			70	100
301 005	Fluid Mechanics II	4	4	30	50	50	70	200
301 006	Employable Skill Development		2		50			50
	<b>Total →</b>	18	10	150	150	100	350	750

Semester – II								
Subject code	Subject	Teaching Scheme Hrs/Week			Examination Scheme			
		Lect	Pr	In-Semester Assessment	Pr/TW	Or	End - Semester Exam	Total
301 007	Advance Surveying	4	2	30		50	70	150
301 008	Project Management and Engineering Economics	4	-	30		-	70	100
301 009	Foundation Engineering	4	-	30		-	70	100
301 010	Structural design II	4	4	30	50	50	70	200
301 011	Environmental Engineering I	4	2	30	50		70	150
301 012	Seminar & Technical Communication		2	30	50			50
	<b>Total →</b>	20	10	150	150	100	350	750

**Savitribai Phule University of Pune**  
**Third Year Civil Engineering**  
**(2015 Course)**

**Semester I**

Course Code	Course	Teaching Scheme hour/week			Semester Examination Scheme of marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	T W	OR	PR	Total	TH/TUT	PR/OR/TW
301001	Hydrology and water resource engineering	03	--	02	30	70	--	50	--	150	04	01
301002	Infrastructure Engineering and Construction Techniques	03	--	--	30	70	--	--	--	100	04	--
301003	Structural Design-I	04	--	04	30	70	50	50	--	200	04	02
301004	Structural Analysis-II	04	--	--	30	70	--	--	--	100	04	--
301005	Fluid Mechanics-II	04	--	02	30	70	--	50	--	150	04	01
301006	Employability Skills development	--	--	02	--	--	50	--	--	50	--	01
Total		18	--	10	150	350	100	150		750	20	05

**Semester II**

Course Code	Course	Teaching Scheme hour/week			Semester Examination Scheme of marks						Credit	
		Theory	Tutorial	Practical	In-Sem	End-Sem	T W	OR	PR	Total	TH/TUT	PR/OR/TW
301007	Advanced Surveying	03	--	02	30	70	50	--	--	150	04	01
301008	Project Management and Engineering Economics	04	--	--	30	70	--	--	--	100	04	--
301009	Foundation Engineering	03	--	--	30	70	--	--	--	100	04	--
301010	Structural Design-II	04	--	04	30	70	50	50	--	200	04	02
301011	Environmental Engineering-I	04	--	02	30	70	--	--	50	150	04	01
301012	Seminar	--	--	01	--	--	--	50	--	50	--	01
Total		18	--	09	150	350	100	100	50	750	20	05

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	--	2			50			50
	<b>Total →</b>	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
	<b>Total →</b>	12	6	8	120	150	200	280	750

**University of Pune**  
**Structure of S.E. Civil Engineering ( 2012 Course)**  
**With effect from A.Y:2013-2014**  
**Semester I**

Code	Subject	Teaching Scheme (in Hrs/week)			Examination Scheme of Marks					
		Lect	Tutorials	Pr/Drg.			Tw	Pr	Or	Max.Marks
					Theory Paper	Online Paper				
201001	Building Technology and Materials	3	-	4	50	50	25		50	175
207001	Engg.Maths III	4	1	-	50	50	25	-	-	125
201006	Surveying	4	-	2	50	50	25	50	-	175
201002	Strength of Materials	4	-	-	50	50	-	-	-	100
201003	Geotechnical Engineering	4	-	2	50	50	-	-	50	150
201010	Soft Skills	-	-	2	-	-	25	-	-	25
	<b>Total</b>	<b>19</b>	<b>1</b>	<b>10</b>	<b>250</b>	<b>250</b>	<b>100</b>		<b>150</b>	<b>750</b>

**Semester II**

Code	Subjects	Teaching Scheme (in Hrs/week)			Examination Scheme of Marks					
		Lect.	Tutorials	Pr/Drg.			Tw	Pr	Or	Max.Marks
					Theory Paper	Online Paper				
201004	Fluid Mechanics I	4	-	2	50	50	25	-	50	175
201005	Architectural Planning and Design of Buildings	4	-	4	50	50	25	50		175
201008	Structural Analysis-I	4	-	-	50	50	-	-	-	100
207009	Engineering Geology	4	-	2	50	50	25	-	-	125
201007	Concrete Technology	4	-	-	50	50	-	-	-	100
201009	Testing of Materials	-	-	2	-	-	25		50	75
			<b>20</b>	<b>10</b>	<b>250</b>	<b>250</b>	<b>100</b>		<b>150</b>	<b>750</b>

Savitribai Phule Pune University  
S.E. (Civil Engineering) 2015 Course

Semester I												
Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credit	
		Theory (TH)	Tutorials (TUT)	Practical (PR)	In- Sem	End- Sem	TW	PR	OR	Total	TH/ TUT	PR/OR/ TW
201001	Building Technology and Materials	04	--	02	50	50	50	--	--	150	04	01
207001	Engineering Mathematics III	04	01	--	50	50	50	--	--	150	05	
201006	Surveying	04	--	02	50	50	--	50	--	150	04	01
201002	Strength of Materials	04	--	02	50	50	--	--	50	150	04	01
201003	Geotechnical Engineering	04	--	02	50	50	--	--	50	150	04	01
	Audit Course I Awareness to Civil Engineering Practices	--	--	--	--	--	--	--	--	--	Grade	
Total		20	01	08	250	250	100	50	100	750	25	

Note: For audit courses students are given certificate by the institutes based on the assignment submitted by them.

Abbreviations: TW: Term Work, OR: Oral, PP: Passed (Only for non credit courses), NP: Not Passed (Only for non credit courses).

Savitribai Phule Pune University  
S.E. (Civil Engineering) 2015 Course

Semester II													
Course Code	Course	Teaching Scheme Hours / Week			Semester Examination Scheme of Marks						Credit		
		Theory (TH)	Tutorials (TUT)	Practical (PR)	In-Sem	End-Sem	TW	PR	OR	Total	TH/ TUT	PR/OR/ TW	
201004	Fluid Mechanics I	04	--	02	50	50	--	--	50	150	04	01	
201005	Architectural Planning and Design of Buildings	04	--	02	50	50	--	50	--	150	04	01	
201008	Structural Analysis I	03	01	--	50	50	--	--	--	100	04	--	
207009	Engineering Geology	04	--	02	50	50	50	--	--	150	04	01	
201007	Concrete Technology	04	--	02	50	50	--	--	50	150	04	01	
201010	Soft Skill	--	--	02	--	--	50	--	--	50	--	01	
	Audit Course 2 Road Safety Management	--	--	--	--	--	--	--	--	--	Grade		
		19	01	10	250	250	100	50	100	750	25		

Note: For audit courses students are given certificate by the institutes based on the assignment submitted by them.

Abbreviations; TW: Term Work, OR: Oral, PP: Passed (Only for non credit courses), NP: Not Passed (Only for non credit courses).

§ : Mandatory subjects of first, second and third semester must include at least 40 credits for Engineering Physics, Engineering Chemistry, Engineering Mathematics, social science and soft skills  
In addition to above credits, there should be audit courses in semester five, six and seven to develop the various skills.

The detail structure is given in Tables

TABLE - 2 Structure for Semester-1

Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
			Lectures	Tutorials	PR/DRG	Theory		TW	PR	OR	Max. Marks	
						In-Semester Exam	End-Semester Exam					
107001	Engineering Mathematics I		4	1	-	50	50	25	-	-	125	5
# 107002 / 107009.	Engineering Physics OR Engineering Chemistry		4	-	2	50	50	25	-	-	125	5
102006	Engineering Graphics I		3	-	2	50	50	-	-	-	100	4
# 103004 / 104012	Basic Electrical Engineering OR Basic Electronics Engineering		3	-	2	50	50	25	-	-	125	4
101005	Basic Civil and Environmental Engineering		3	-	2	50	50	25	-	-	125	4
110003	Fundamentals of Programming Languages I		1	-	2	-	-	-	50*	-	50	2
111007	Workshop Practice		-	-	2	-	-	50	-	-	50	1
<b>Total of Semester I</b>			18	1	12	250	250	150	50	-	700	25





TABLE - 3 Structure for Semester-2

Code	Subjects	Short Name	Weekly Work Load (in Hrs)			Semester Examination Scheme of Marks						Credits
			Lectures	Tutorials	PR/DRG	Theory		TW	PR	OR	Max. Marks	
						In-Semester Exam	End-Semester Exam					
107008	Engineering Mathematics II		4	-	-	50	50	-	-	-	100	4
# 107009 / 107002	Engineering Chemistry OR Engineering Physics		4	-	2	50	50	25	-	-	125	5
102013	Basic Mechanical Engineering		3	-	2	50	50	25	-	-	125	4
101011	Engineering Mechanics		4	-	2	50	50	25	-	-	125	5
# 104012 / 103004.	Basic Electronics Engineering OR Basic Electrical Engineering		3	-	2	50	50	25	-	-	125	4
110010	Fundamentals of Programming Languages II		1	-	2	-	-	-	50*	-	50	2
102014	Engineering Graphics II		-	-	2	-	-	50	-	-	50	1
<b>Total of Semester II</b>			19	-	12	250	250	150	50	-	700	25

**Instructions:**

1. PR/Tutorial must be conducted in minimum three batches (batch size 22 maximum) per division
2. Minimum number of required Experiments/Assignments in PR/DRG/Tutorial be carried out as mentioned in the syllabi of related subjects.
3. \* for FPL-I and FPL-II: S.P. Pune University Online Practical Examination shall be conducted at the semester end.
4. # Every student should appear for Engineering Physics, Engineering Chemistry, Basic Electronics Engineering and Basic Electrical Engineering during the year.
5. # College is allowed to distribute Teaching Workload of subjects Physics, Chemistry, BEE, BXE in semester I and II by dividing number of FE divisions appropriately in two groups.



## 101005 Basic Civil and Environmental Engineering

### Teaching Scheme

Lectures: 03hours /week  
Practicals: 02 hours /week

### Examination Scheme

Online Exam. 50 marks  
Theory Exam. 50 marks  
Term work: 25 marks

### Section I

#### Unit 1: Introduction to Civil Engineering (6 hours)

- a) Basic Areas in Civil Engineering Surveying, Construction Engineering, Fluid Mechanics, Transportation Engineering, Irrigation Engineering, Project Management, Structural Engineering, Geotechnical and Foundation Engineering, Environmental Engineering, Quantity Surveying, Town Planning, Earthquake Engineering, Infrastructure Development.
- b) Role of Civil Engineer in the construction of buildings, dams, expressways and infrastructure projects for 21<sup>st</sup> century. Importance of an interdisciplinary approach in engineering.

#### Unit 2: Materials and Construction (6 hours)

- a) basic materials for construction - cement, bricks, stone, natural and artificial sand, Reinforcing Steel-Mild, Tor and High Tensile Steel. Concrete types - PCC, RCC Prestressed and Precast. Recycling of materials.
- b) *Substructure*- Definition and functions of Foundation, (Only concepts of settlement and Bearing capacity of soils.) Types of shallow foundations, Deep foundation (only concept of friction and end bearing pile).
- c) *Superstructure* - Types of loads: - DL and LL., wind loads, earthquake considerations. Types of Construction-Load Bearing, Framed, Composite. Fundamental requirements of masonry.
- d) Introduction to automation in construction:- Concept, need, examples related to different civil engineering projects.

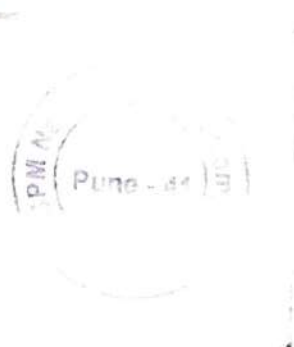
#### Unit 3: Uses of maps and field surveys (6 hours)

- a) Principles of survey, introduction to scale, types of maps and their uses.. Modern survey methods using levels, Theodolite, EDM, lasers, total station and GPS. Measuring areas from maps using digital planimeter.
- b) simple and differential levelling for setting out various benchmarks, determining the elevations of different points and preparation of contour maps. Introduction to GIS Software and its application areas.

### Section II

#### Unit 4: Ecology and Eco System (6 hours)

- a) Concept of Environment - biotic and abiotic factors. Impact of the human behaviour and the technological advancements on the environment. Need for conserving natural resources and preserving the environment. Engineer's role in achieving sustainable development. Environmental Impact Assessment (only concept).
- b) Introduction to solid waste management, electronic wastes and its disposal.



**Unit 5: Planning for the Built Environment (6 hours)**

- a) Concept of an integrated built environment-natural and manmade. Principles of planning, viz. Aspect, Prospect, Roominess, Grouping, Privacy, Circulation, Sanitation, Orientation, Economy.
- b) Use of various eco-friendly materials in construction. Concept of green buildings.
- c) Role of by-laws in regulating the environment, Concept of built up area, carpet area, plinth area. Plot area, FSI.

**Unit 6: Energy and Environmental Pollution (6 hours)**

- a) Types of energy:- conventional and non-conventional. Need for harnessing alternative energies to meet the increased demand. Methods of harnessing energies.
- b) Sources, causes, effects and remedial measures associated with
  1. Air Pollution
  2. Water pollution
  3. Noise Pollution
  4. Land Pollution

**Term Work:**

Any 8 Practical Exercises from those given below should be carried out, record to be submitted in the field book and file which will form a part of term work.

1. Study of any 4 types of maps and writing their uses.
2. Exercise on use of dumpy level and laser level.
3. Measurement of area of irregular figures by digital planimeter.
4. Drawing of plan elevation & section for a residential building, single storeyed framed/load bearing structure. Preparing schedule of openings [On half imperial sheet.]
5. Determination of coordinates of a traverse using Global Positioning system (GPS)
6. Measurement of distance by EDM and comparing it with the distance measured using tape.
7. Visit to a construction site for studying the various construction materials used, type of structure, type of foundation and components of superstructure – submission of visit report.
8. Demonstration of use of any 4 Civil Engineering softwares.
9. Making a poster (Full imperial sheet size) in a group of 4 students, related to Energy/Environment.
10. Presentation in a group of 4 students, any case study related to Energy/Environment.

**Text Books :**

- 1) Surveying and Levelling by Kanitkar, Kulkarni—Pune Vidyarthi Prakashan
- 2) Build Planning and Built Environment by Shah ,Kale, Patki—Tata Mc Graw Hill
- 3) Civil Engg. Materials by Dr . S.V.Deodhar---Khanna Publications

**Reference Books :**

- 1)) Basic Civil Engineering by M.S..Palanichamy Tata Mc Graw Hill publishing Co.Ltd.N.D.
- 2) Basic Civil Engineering by Shatheesh Gopi---Pearson
- 3) Elements of Civil Engg. and Engg.Mech. by R.V.Raikar---PHI Learning Pvt I.td.





# 102013 - Basic mechanical Engineering (2012 Pattern)

Teaching Scheme: Theory: 3 Lectures/Week Practical: 2 Hrs./Week Term Work: 25 Marks

### Examination Scheme:

On-line Test I	25 Marks	Duration: 30 Minutes.	<del>Units I &amp; II</del>
On-line Test II	25 Marks	Duration: 30 Minutes	<del>Units III &amp; IV</del>
Theory Paper	50 Marks	Duration: 2 Hrs.	<del>Units I - VI</del>

### Course Objectives:

- This course will help the student to acquire knowledge of mechanical engineering.
- Describe the scope of mechanical engineering with multidisciplinary industries.
- Understand and identify common machine elements with their functions and power transmission devices.
- Learn conventional machine tools and understand the concept of design in mechanical engineering.
- Impart knowledge of basic concepts of thermodynamics applied to industrial applications.
- Understand laying principles of energy conversion systems and power plants.

**Unit 1: Introduction to Mechanical Engineering** 6 Hrs.  
**Mechanical Elements:-** Function, Sketch, Description, Uses of- Shaft, Axle, Key (Parallel key), Coupling (Rigid Flanged Coupling), Bearing-(Ball bearing), Clutch- Single Plate Clutch, Brake - Disc Brake.  
**Power Transmission Devices:** Construction, working, comparison & applications of: Belt Drive (Flat and V Belt), Chain Drive and Spur Gear Drive arranged with simple gear train.

**Unit 2: Design Fundamentals** 6 Hrs.  
**Design:** Steps in design process, Mechanical Properties (Strength, Toughness, Hardness, Ductility, Malleability, Brittleness, Elasticity, Plasticity, Resilience, Fatigue, Creep) and selection of Engineering materials, Applications of following materials in engineering -Aluminium, Plastic, Steel, Brass, Cast Iron, Copper, Rubber  
**Mechanism (Descriptive treatment only):** Definition and comparison of Mechanism and Machine, Four Bar Mechanism, Slider Crank Mechanism.

**Unit 3: Manufacturing Processes** 6 Hrs.  
 Introduction to Manufacturing Processes and their Applications (Casting, Forging, Sheet metal working and Metal joining processes), Description of the Casting process: Sand casting (Cope & Drag), Sheet metal Forming (shearing, bending, drawing). Forging (Hot working and cold working comparison), Electric Arc welding, Comparison of – Welding, Soldering, Brazing.

**Unit 4: Machine Tools** 6 Hrs.  
 Basic Elements, Working Principle, Types of Operations with block diagram: Lathe Machine - Centre Lathe, Drilling Machines, Grinding Machines.

**Unit 5: Thermal Engineering** 6 Hrs.  
**Thermodynamics:** Thermodynamics system (open, close, isolated), Thermodynamic Properties: Definition and Units of –Temperature, Pressure (atmospheric, absolute and gauge), Volume, Internal energy, Enthalpy, Concept of Mechanical work, , Thermodynamics Laws with example- Zeroth Law, First Law, Limitations of



first law, Concept of heat Sink, Source, heat engine, heat pump, refrigeration engine, 2<sup>nd</sup> Law of thermodynamics statements (Kelvin Plank, Clausius), Numerical on 2<sup>nd</sup> law only.

**Measurement:** Measurement of Temperature (Thermocouple – Type according to temperature range and application), Measurement of Pressure (Barometer, Bourdon pressure gauge, Simple U tube Manometer with numerical).

### Unit 6: Applied Thermal Engineering

6 Hrs.

**Power Plant Engineering:** Conventional and non-conventional energy resources, Hydro-electric, Thermal, Nuclear, Wind, Solar [with Block diagram].

**Power Producing Devices:** Boiler - Water tube and fire tube, Internal combustion engine – Two stroke and four stroke (Spark ignition and compression ignition), Turbines – Impulse and reaction.

**Power Absorbing Devices:** Pump – Reciprocating and Centrifugal, Compressor – Single acting, single stage reciprocating air compressor, Refrigeration – Vapour compression refrigeration process, House hold refrigerator, Window air conditioner (Working with block diagrams).

### Term Work

Term work shall consist of the following:

1. Study of power transmitting elements: couplings, gears and bearings.
2. Study of mechanisms: four bar mechanism, slider crank mechanism
3. Study, demonstration and working of centre lathe machine
4. Study of any one power plant
5. Study, demonstration on two stroke and four stroke engine.
6. Study, domestic refrigerator and window air conditioner.
7. Study of Package Type Boiler.
8. Report on visit or guest lecture related to mechanical engineering.

### Text Books:

1. G. Shanmugam, S. Ravindran, "Basic Mechanical Engineering", Tata McGraw-Hill Publisher Co. Ltd.
2. R. K. Purohit, "Foundation of Mechanical Engineering", Scientific Publishers.
3. C. S. Chetankumar, B. P. Mahesh, "Elements of Mechanical Engineering", S. Chand Publications.
4. P. K. Nag, "Engineering Thermodynamics", Tata McGraw-Hill Publishing Co. Ltd.
5. Chaudhari, Hajra, "Elements of Workshop Technology", Volume I and II, Media Promoters and Publishers, Mumbai.

### Reference books:

1. P. K Nag "Thermodynamics", Tata McGraw-Hill Publishing Co. Ltd
2. V. B. Bhandari "Design of Machine Elements" Tata McGraw-Hill Publishing Co. Ltd
3. S. S. Ratan, "Theory of Machine" Tata McGraw-Hill Publishing Co. Ltd
4. Yunus A. Cengel and Boles, "Thermodynamics", Tata McGraw-Hill Publishing Co. Ltd
5. Arora and Domkunwar, "Thermal Engineering", Dhanpat Rai and Sons.
6. Surinder Kumar, "Basics of Mechanical Engineering", Ane Books Pvt. Ltd., New Delhi, 2011
7. T. J. Parbhu, V. Jaiganesh and S. Jebaraj, "Basic Mechanical Engineering", Scitech Publications (India) Pvt. Ltd. Chennai, 2010.

