



# SOLAPUR UNIVERSITY, SOLAPUR

Faculty of Engineering & Technology (Revised from 2013-2014)

Credit System structure of S. E. Civil- I, W. E. F. 2015-2016; Semester- I

S.E  
Now [CGPA]

Theory Course Name	Hrs./week				Credits	Examination Scheme			
	L	T	P	D		ISE	ESE	ICA	Total
Concrete Technology	2	-	-	-	2	30	70	-	100
Structural Mechanics-I	3	-	-	-	3	30	70	-	100
Surveying -I	3	-	-	-	3	30	70	-	100
Building Construction & Drawing	3	-	-	-	3	30	70	-	100
Fluid Mechanics-I	3	-	-	-	3	30	70	-	100
Engg. Geology	3	-	-	-	3	30	70	-	100
<b>Total</b>	<b>17</b>				<b>17</b>	<b>180</b>	<b>420</b>	<b>-</b>	<b>600</b>
<b>Laboratory/Drawings</b>							<b>POE</b>	<b>OE</b>	
Concrete Technology	-	-	2	-	1	-	-	-	25
Structural Mechanics-I	-	-	2	-	1	-	-	-	25
Surveying -I	-	-	2	-	1	-	25	-	25
Building Construction & Drawing	-	-	-	2	1	-	-	-	25
Fluid Mechanics-I	-	-	2	-	1	-	25	-	25
Engg. Geology	-	-	2	-	1	-	25	-	25
Lab. Practice	-	-	2*	-	0.5	-	-	-	25
<b>Total</b>	<b>-</b>	<b>-</b>	<b>11</b>	<b>2</b>	<b>6.5</b>	<b>-</b>	<b>75</b>	<b>175</b>	<b>250</b>
<b>Grand Total</b>	<b>17</b>	<b>-</b>	<b>11</b>	<b>2</b>	<b>23.5</b>	<b>180</b>	<b>495</b>	<b>175</b>	<b>850</b>
Environmental Science	1	-	-	-	-	-	-	-	-

**Abbreviations:** L- Lectures, P -Practical, T- Tutorial, D- Drawing. \*- Alternate week, ISE -Internal Tests, ESE - University Examination (Theory &/ POE &/Oral examination), ICA- Internal Continuous Assessment.

## Note:

- (1) The number of students in a practical/Tutorial batch shall be 20. New batch shall be formed if the number of remaining students (after forming batches of 20) exceeds 9.
- (2) Term work assessment: Term Work assessment shall be a continuous process based on the performance of the student in assignments, class tests, quizzes, attendance and interaction during theory and lab sessions, journal writing, report presentation etc., as applicable.
- (3) Student is required to study and pass Environmental Science subject in Second Year of Engineering to become eligible for award of degree.



**Solapur University, Solapur**  
**S.E. (Civil Engineering) Semester-III**  
**ENGINEERING GEOLOGY**

**Teaching Scheme**

**Theory – 3 Hrs/Week**

**Practical – 2 Hr/Week**

**Examination Scheme**

**Theory – 100 Marks**

**Term Work – 25 Marks**

**Pract-Oral: 25 Marks**

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**Course Objectives**

- 1) The students will be introduced to the scope and relation of geology with civil engineering.
- 2) The students will learn physical geology, mineralogy, petrology, structural geology, and hydrology.
- 3) The students will be able to identify types of stones and minerals.
- 4) The students will be introduced to Geological aspects of earthquakes, landslides.
- 5) They will learn site investigation for dams, reservoir, bridges and various other civil engineering structures.

**Course Outcomes:**

At the end of this course:

- 1) Students will be able to identify different type of rocks and minerals.
- 2) Students will be able to draw geological maps.
- 3) This course will help them for preliminary geological investigation of site related to civil engineering projects.

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**SECTION – I**

**Unit 1.**

**(04 Hrs.)**

- (a) General Geology: Introduction, Definition, Scope and Subdivision of the Geology subject, interrelation between Geology and civil Engineering.
- (b) Physical Geology: Major relief features of earth, External and Internal forces modifying the surface of earth, Interior of earth.



## **PRACTICAL WORK**

- 1) Mineralogy: Physical properties of Minerals. Study of Physical properties.
- 2) Identification of the following Minerals: Crystalline, Cryptocrystalline and amorphous Varieties of Silica, Orthoclase, Plagioclase, Zeolite, Muscovite, Biotite, Augite, Hornblende, Olivine, Talc, Serpentine, Chlorite, Kyanite, Asbestos, Beryl, Tourmaline, Garnet, Calcite, Gypsum, Fluorite, Corundum etc. Important ores such as Hematite, Magnetite, Limonite, Pyrite, Psilomelane, Chromites, Chalcopyrite, Galena, Malachite, Graphite
- 3) Petrology: Study and Identification of the following Rock types
- 4) Igneous Rocks: Granite, Pink Granite, Porphyritic Granite, Syenite, Diorite, Gabbro, Rhyolite, Pumice, Trachyte, Andesite, Varieties of Basalt, Obsidian, volcanic breccia, tachylite, Pegmatite, Graphic Granite, Dolerite.
- 5) Secondary Rocks: Laterite, Bauxite, Conglomerate, Breccia, Sandstone, ferruginous Sandstone, Grit, Arkose Shales, Mudstone, chemical and organic Limestone, coal.
- 6) Metamorphic Rocks: Slate, Phyllite, marble, serpentine, marble, Mica Schist, Biotite schist, muscovite Schist, Chlorite Schist, Talc Schist, Talc Chlorite Schist, Kyanite Schist, Granite Gneiss, banded granite Gneiss, Augen Gneiss.
- 7) Study of different types of geological maps, Section and their engineering significance. (at least 10)
- 8) Study of structural Geological models. (at least 5)
- 9) Study tour to the place worth visiting from Engineering Geological point of view.
- 10) Study of core samples, Core Logging.
- 11) Identification of Subsurface rock with the help of Resistivity Instrument.

## **TERM WORK**

A journal containing complete record of above practical work shall be examined as a term work. Practical Examination shall be based on practical course.

## **TEXT BOOKS**

1. Principles of Petrology – By G.W. Tyrrell
2. Principles of physical Geology-By A. Holmes- ELBS, London
3. Textbook of Geology by P. K. Mukherjee
4. A text book of Engineering Geology –By R. V. Gupte- Pune Vidyarthi Griha Prakashan Pune.
5. Engineering Geology for civil Engineering – By Dr. D.V.Reddy.
6. Engineering Geology –by B. S. Sathynarayan Swami.
7. Rutley's Elements of Mineralogy- By H.H. Read –CBS Pub. Delhi.



**Solapur University, Solapur**  
**Structure of T.E. (Civil Engineering) Semester -V**

**T.E. (Civil Engineering) Semester –V**

Sr. No.	Subject	Teaching/Week					Examination scheme				
		L	Pr.	Tu	Dr.	Total	Theory	TW	POE	O E	Total
1	Design of Steel Structures	3	2	-	-	5	100	25	-	-	125
2	Geotechnical Engg.I	3	2	-	-	5	100	25	25	-	150
3	Building Planning & Design	3	-	-	4	7	100	25	-	25	150
4	Environmental Engg.I	3	2	-	-	5	100	25	-	-	125
5	Engineering Management- I	3	-	-	-	3	100	25	-	-	125
6	Transportation Engg.-I	3	2	-	-	5	100	25	-	-	125
7	Self Learning (H.S.S. course)	-	-	-	-	-	50	-	-	-	50
<b>Total</b>		18	8		4	30	600	200	25	25	<b>850</b>

**Note:**

(1) Students shall undergo a field training of 15 days in the winter vacation after T.E. Part I and submit the field training report, which shall be assessed by faculty associated with Engineering Management- II in T.E. Part II.

(2) Term work assessment: Term Work assessment shall be a continuous process based on the performance of the student in assignments, class tests, quizzes, attendance and interaction during theory and lab sessions, syllabus, report presentation etc., as applicable.

(3) Syllabus of Self learning (H.S.S.) is common for all Under Graduate Programs under Faculty of Engineering and Technology.





## **T.E. (CIVIL ENGINEERING) PART- I**

### **ENVIRONMENTAL ENGINEERING –I**

#### **Teaching Scheme**

Lectures: 3 hours per week  
Practical: 2 hours per week

#### **Examination Scheme**

Theory papers: 100 Marks  
Term Work: 25 Marks

#### **Course Objectives**

1. To acquaint the students with drinking water quality standards and forecast water demands.
2. Study of various units of water treatment plants, treatment procedures and sequencing of water treatment units for various sources of water.
3. To prepare the students to carry out design of water distribution systems and appurtenances using appropriate methods.
4. To acquaint the students with various plumbing systems, and their operation and maintenance.

#### **Course Outcomes**

Upon successful completion of course the student will be able to:

1. Plan and design water supply systems for a rural/urban area based on population forecasts.
2. Design various water treatment units and plan their operations on the basis of raw water quality and water demand.
3. Apply knowledge of advanced water treatment processes for individual water purification units.
4. Design and supervise building plumbing systems and their maintenance.

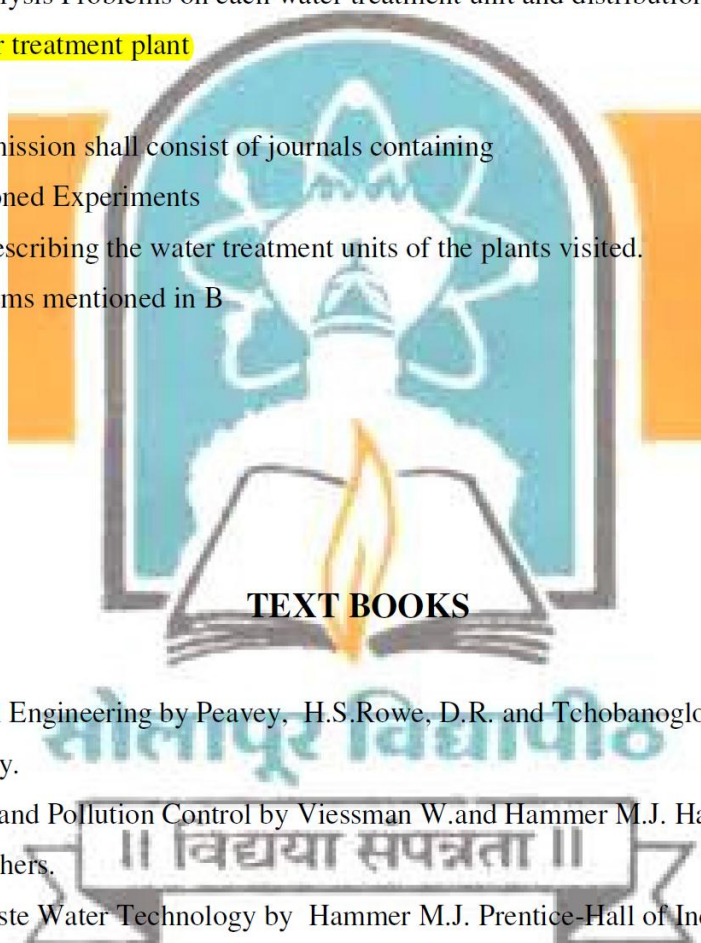
- 11 Most Probable Number
- 12 Optimum dose of alum by jar test
- 13 Fluorides
- 14 Nitrogen
- 15 Irons and Manganese

(B) Design /Analysis Problems on each water treatment unit and distribution system.

**(C) Visit to water treatment plant**

Term work submission shall consist of journals containing

- 1. Above mentioned Experiments
- 2. Visit report describing the water treatment units of the plants visited.
- 3. Design problems mentioned in B



- 1.Environmental Engineering by Peavey, H.S.Rowe, D.R. and Tchobanoglous McGraw Hill Book Company.
- 2.Water Supply and Pollution Control by Viessman W.and Hammer M.J. Harper Collins College Publishers.
- 3.Water and Waste Water Technology by Hammer M.J. Prentice-Hall of India Private Ltd.
- 4.Water and Wastewater Technology by G.S. Birdie and J.S. Birdie
- 5.Water Supply by Duggal K.N. ,S. Chand and Company.
- 6.Water Supply by Garg S.K., Khanna Publishers.
- 7.Water Supply and Waste water Disposal by Fair and Gayes, John Wiley Publication.
- 8.Water Supply Engineering by B.C.Punmia,Ashok Jain,Arun Jain, Laxmi Publications



**T.E. (Civil Engineering) Semester –VI**

Sr. No.	Subject	Teaching/Week					Examination scheme				
		L	Pr.	Tu	Dr.	Total	Theo ry	TW	PO E	OE	Tot al
1	Structural Mechanics-III	4	2	-	-	6	100	25	-	-	125
2	Geotechnical Engg.II	4	2	-	-	6	100	25	-	-	125
3	Environmental Engg.II	3	2	-	-	5	100	25	-	25	150
4	Engineering Management- II	4	2	-	-	6	100	25	-	25	150
5	Transportation Engg.-II	3	-	-	-	3	100	25	-	-	125
6	Steel Structural Design & Drawing	-	-	-	4	4	-	50	-	25	75
7	Mini project (Any subject in Civil Engg.)	-	-	-	-	-	-	25	-	-	25
8	Assessment of field training report	-	-	-	-	-	-	25	-	-	25
9	Self Learning (Technical course)	-	-	-	-	-	50	-	-	-	50
<b>Total</b>		18	8	-	4	30	500	275	-	75	<b>850</b>

Note:

(1) Students shall undergo a field training of 15 days in the summer vacation after T.E. Part II. The training report shall be assessed in B.E. Part -I by the concerned project guides.

(2) The batch size for the practical/tutorial is of 15 students. On forming the batches, if the number of remaining students exceeds 7 students, then a new batch be formed.

(3) Term work assessment: Term Work assessment shall be a continuous process based on the performance of the student in assignments, class tests, quizzes, attendance and interaction during theory and lab sessions, journal writing, report presentation etc., as applicable.





## **T.E. (CIVIL ENGINEERING) PART II**

### **ENVIRONMENTAL ENGINEERING –II**

#### **Teaching Scheme**

Lectures: 3 Hours per week

Practical: 2 Hours per week

#### **Examination Scheme**

Theory papers: 100 Marks

Term Work: 25 Marks

Oral Examination: 25 Marks

#### **Course Objectives**

1. To acquaint the students with the characterization of municipal waste, as well as sewage collection & conveyance systems.
2. Study of Primary and Secondary treatment methods of sewage, and concept of recycling the wastewater.
3. Familiarize the students with stream pollution due to waste disposal and suitable centralized/decentralized wastewater Treatment system
4. Learning solid waste and hazardous waste management systems for urban areas.
5. Understanding various sources of air pollution, its measurement and control.

#### **Course Outcomes**

Upon successful completion of course the student should be able to:

1. Plan the layout of sewage collection system, matching the topography of the region and characterisation of sewage.
2. Decide sequence and design of wastewater treatment units to meet the sewage treatment standards.
3. Design the wastewater treatment plant using Trickling filter, anaerobic treatment and low cost treatment methods
4. Adopt appropriate methods of Solid waste Disposal and Management of hazardous waste.
5. Measure air pollution and adopt control measures to control of industrial air pollution.



3. Biochemical Oxygen Demand
4. Chemical Oxygen Demand
5. Chlorides
6. Oil & Grease
7. Sulphate Content
8. Total Nitrogen
9. Demonstration of High Volume Sampler
10. Demonstration of Auto Exhaust Analyzer.

(B) Design of sewerage system & Treatment system for a small urban area.

(C) Visit to sewage treatment plant

Term work submission shall consist of the following –

1. Journal containing experiments carried out in part A of the term work and visit Report on C
2. Detail design and appropriate drawings required for part B of the term work.

### TEXT BOOKS

1. Environmental Engineering by Peavey- H. S. Rowe, D.R. and Thobanoglous, [McGraw – Hill Book Company]
2. Water supply and pollution control - Viessman W. and Hammer M.J. [Harper Collins College Publishers.]
3. Waste Water Engineering Treatment & Disposal - Mertsalf & Eddy, [Tata McGraw Hill, 1982]
4. Sewage Disposal and Air Pollution Engineering - Garg S.K., [Khanna Publishers]
5. Sewage Disposal and Air Pollution Engineering - Garg S.K., [Khanna Publishers]
6. Waste water Supply Engineering by B. C. Punmia
7. Solid Waste Management in Developing countries - Bhide A.D. and Sundersen B.B. [Indian National Scientific Documentation Centre, New Delhi]
8. Air Pollution- Rao M.N. and Rao H.V.N. [Tata McGraw Hill, 1990]

**Solapur University, Solapur**  
**Structure of B .E. (Civil Engineering)**  
**w. e. f. Academic Year 2015-16.**

**B.E. (Civil Engineering) Semester –VII**

Sr. No.	Subject	Teaching/Week					Examination scheme				
		L	Pr.	Tu.	Dr.	Total	Theory	TW	POE	OE	Total
1	Design of Concrete Structures-I	3	-	1	-	4	100	25	-	-	125
2	Quantity Surveying & Valuation	3	4	-	-	7	100	50	50	-	200
3	Earthquake Engg.	3	2	-	-	5	100	25	-	-	125
4	Water Resources Engg. II	3	2	-	-	5	100	25	-	25	150
5	Elective - I	3	2	-	-	5	100	25	-	25	150
6	Seminar	-	2	-	-	2	-	50	-	-	50
7	a) Project work	-	2	-	-	2	-	25	-	-	25
	b) Assessment of report on field training-II	-	-	-	-	-	-	25	-	-	25
<b>Total</b>		15	14	1	-	30	500	250	50	50	850

**B.E. (Civil Engineering) Semester –VIII**

Sr. No.	Subject	Teaching/Week					Examination scheme				
		L	Pr.	Tu.	Dr.	Total	Theory	TW	POE	OE	Total
1	Design of Concrete Structures-II	4	2	-	-	6	100	25	-	-	125
2	Construction Practices and Town Planning	4	-	-	-	4	100	25	-	-	125
3	Elective - II	3	2	-	-	5	100	25	-	25	150
4	Elective - III	3	2	-	-	5	100	50	-	-	150
5	R. C. C. Structural Design & Drawing-II	-	-	-	4	4	-	50	-	50	100
6	Project work	-	6	-	-	6	-	100	-	100	200
<b>Total</b>		14	12	-	4	30	400	275	-	175	850

Notes:

- (1) Project group be of @ 7 students.
- (2) Elective subject can be offered from the following list, if minimum 15 students opt for that subject.
- (3) Term work assessment: Term Work assessment shall be a continuous process based on the Performance of the student in assignments, class tests, quizzes, attendance and interaction during theory and lab sessions, journal writing, report presentation etc., as applicable

*w. e. f. Academic Year 2015-16*

## B.E. Civil – Part I

### 4. WATER RESOURCES ENGINEERING – II

#### Teaching Scheme:

Lecture : 3 Hrs / Week

Practical: 2 Hrs / Week

#### Examination Scheme

Theory Paper: 100 marks

Term Work: 25 marks

Oral Exam: 25 Marks

#### Course Objectives:

- 1) To study the different aspects of design of hydraulic structures
- 2) To design different types of dams
- 3) To provide knowledge on various hydraulic structures such as energy dissipaters, head and, Cross regulators canal falls and structures involved in cross drainage works
- 4) To understand the analysis of seepage and hydraulic jump

#### Course Outcomes:

After studying this subject the students will be able to

- 1) Plan and design the reservoirs depending upon the water resources potential.
- 2) Analyze and design Gravity dams and Earth dams (Simple Designs).
- 3) Demonstrate the design principles of Arch dams.
- 4) Solve seepage problems for Weirs on Permeable Foundations
- 5) Demonstrate the knowledge of water power engineering and river training.

### SECTION – I

#### Unit 1:

(5)

- a) Planning of Reservoirs: Storage calculations, Control levels, silting of reservoirs, reservoir sedimentation surveys, reservoir losses. Use of remote sensing for reservoir sedimentation surveys.
- b) Dams – Necessity, types of dams, selection of site for dams, selection of type of dam, Introduction to dam instrumentation



**Unit 7:****(5)**

- a) River and River Training Works: Types of rivers, Meandering phenomenon, Types of river training works, river navigation.
- b) Water Logging and Drainage: Causes, effects, preventive and curative measures, alkaline soils, soil efflorescence, drainage arrangements.

**Unit 8:****(5)**

Elements of Hydropower Engineering: Power crisis and competing uses of water, need of harnessing solar energy. Types of water power plants, small hydropower plants, layout and components of each type, Intakes, Conveyance system, Surge tanks, Power house types, components and layout, tail race, Managing power demand using various sources of power.

**TERM WORK**

A) Minimum seven assignments from the following:

- 1) Determination of height of dam: Reservoir capacity calculations based on demand and Supply, fixing control levels of dam.
- 2) Design of gravity dam: Elementary and practical profile with stability calculations
- 3) Earth dam
  - a) Design- Determination of section – slip circle calculations.
  - b) Filters and Drainage arrangements.
- 4) Spillway: Geometrical section, Design of spillway; Energy dissipation arrangements and gates.
- 5) Arch dam layout of constant angle and constant radius
- 6) Drawing sheet: Outlets through earth dam. Masonry dam, layout.
- 7) Drawing sheet: Typical plan and section of Kolhapur type barrage.
- 8) A typical layout of Hydropower plant and its functioning. Calculating reservoir capacity for hydropower plant
- 9) Design of any one Canal Structure / Cross Drainage Works

**B) Report based on Field visits to Irrigation and Water Power Engineering Projects**

**ORAL EXAMINATION**

Oral Examination will be based on the TERM WORK.

## **B.E. (Civil) Part-I**

### **7. a) PROJECT WORK**

#### **Teaching Scheme:**

Practical: 2 hours / week

#### **Examination Scheme:**

Term Work: 25 marks

#### **Objectives:**

- 1) To carry out a thematic design project in one of the specializations of civil engineering
- 2) To carry out a project that will make the students aware of the different facets of civil engineering.

The topic for the Project Work may be from any Civil Engineering and inter-disciplinary area related to Civil Engineering as mentioned in content at B.E. (Civil) Part-I. Practical work at B.E. (Civil) part-I will comprise of literature survey / problem formulation / preparation of experimental setup as the case may be of the identified problem.



*w. e. f. Academic Year 2015-16*

## **B.E. (Civil) Part-I**

### **7. b) ASSESSMENT ON REPORT OF FIELD TRAINING**

**Examination Scheme:**

**Term Work – 25 Marks**

The students are required to undergo training in any of the areas of Civil Engineering for 30 working days beyond the academic schedule between the completion of T.E. (Civil) Part-I and B.E. (Civil) Part-I term end.

The training may be related to any of the Civil Engineering areas or inter-disciplinary areas such as:

- 1) Structural Engineering
- 2) Environmental Engineering
- 3) Geotechnical Engineering
- 4) Transportation Engineering
- 5) Infrastructural Engineering
- 6) Water Resources Engineering
- 7) Town & Country Planning
- 8) Construction Engineering
- 9) Surveying & Remote Sensing Techniques
- 10) Project Management
- 11) Legal Aspects in Civil Engineering
- 12) Earthquake Engineering
- 13) Disaster Management

Student shall submit a report of the field training undergone. The students should obtain a certificate of completion of training from the concerned organization and submit it to the department office. Assessment of the training report will be done by the 'Project Guide' to whom the concerned student is allotted.

*w. e. f. Academic Year 2015-16*



## B.E. (Civil) Part-II

### 6. PROJECT WORK

#### Teaching Scheme:

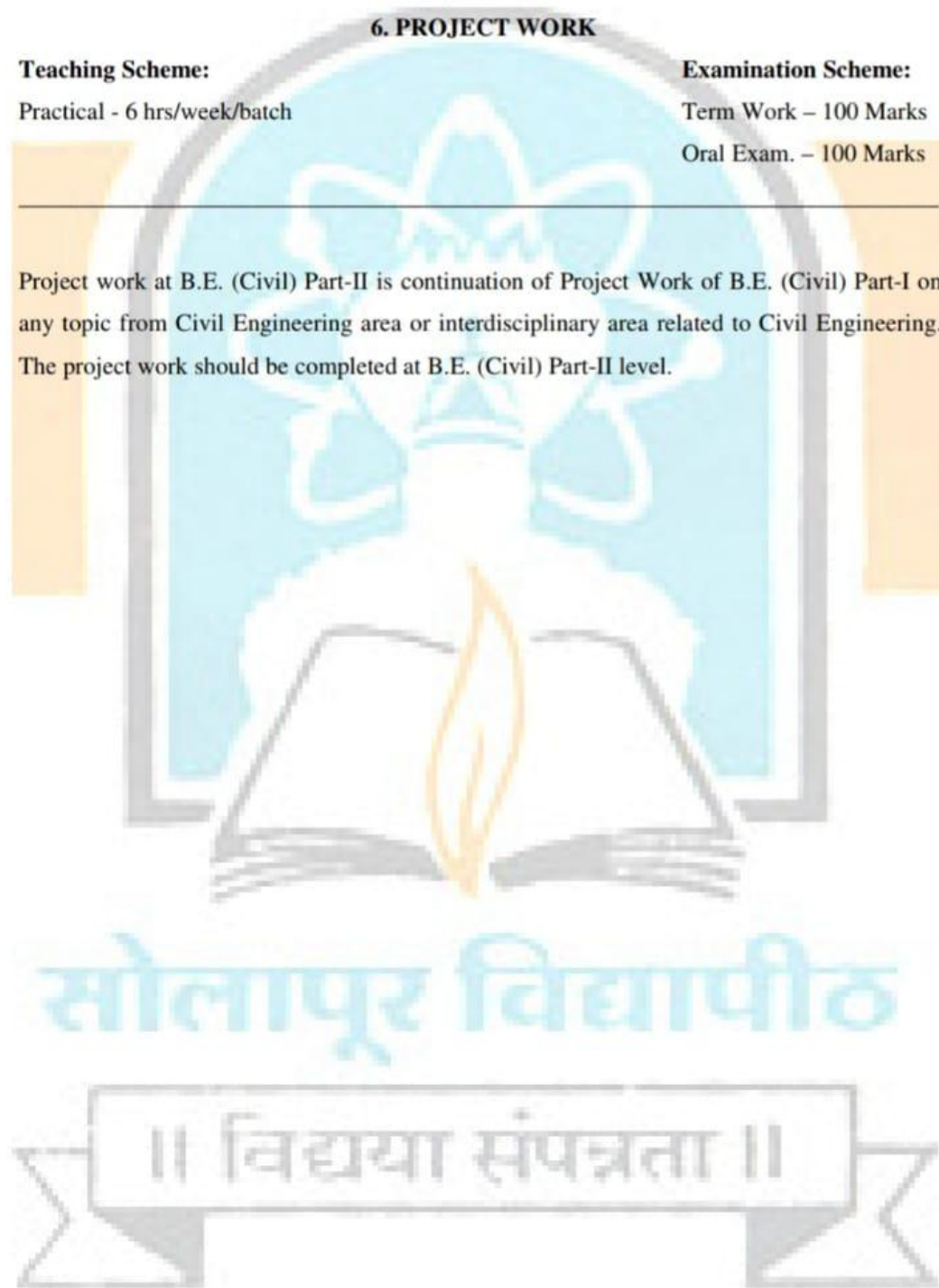
Practical - 6 hrs/week/batch

#### Examination Scheme:

Term Work – 100 Marks

Oral Exam. – 100 Marks

Project work at B.E. (Civil) Part-II is continuation of Project Work of B.E. (Civil) Part-I on any topic from Civil Engineering area or interdisciplinary area related to Civil Engineering. The project work should be completed at B.E. (Civil) Part-II level.



w. e. f. Academic Year 2015-16