



SWAMINARAYAN UNIVERSITY

Program Name: Engineering

Level: B.E.

Course/ Subject Code: BE106301

Course/Subject Name: MECHANICS OF SOLIDS

w.e.f.Academic Year:	2022-23
Semester:	3 rd Semester/ 2 nd Year
Category of the Course:	Basic Science Course

Prerequisite:	A strong foundation in Engineering Mechanics, including understanding of forces, moments, centroids, moment of inertia, stress, and strain, is essential for studying Mechanics of Solids.
Rationale:	To acquire Basic knowledge of Rigid and Deformable body, System of units, Laws of motion, Basic idea of force, Concept of centroid, Fundamentals of stress, strain and their relationships.

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/Practical		
				(E)	(M)	(I)	(V)	
4	0	2	5	60	40	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weight age
1.	Introduction Definition of space, time, particle, rigid body, deformable body. Force, types of forces, Characteristics of a force, System of forces, Composition and resolution of forces. Fundamental Principles of mechanics : Principle of transmissibility, Principle of super position, Law of parallelogram of forces.	2	4
2.	Fundamentals of Statics Coplanar concurrent forces: Resultant of coplanar concurrent force system by analytical and graphical method, Law of triangle of forces, Law of polygon of forces, Free body diagrams, Equilibrium conditions, Lami's theorem. Application of statically determinate pin – jointed structures. Coplanar non-concurrent forces: Moments & couples, Characteristics of moment and couple, Equivalent couples, Force couple	10	30



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	system, Varignon's theorem, Resultant of non-concurrent forces by analytical method, Equilibrium conditions of coplanar non-concurrent force system.		
3.	Statically determinate beams Types of loads, Types of supports, Types of beams; Determination of support reactions, Relationship between loading, shear force & bending moment, Bending moment and shear force diagrams for beams subjected to only three types of loads i) concentrated loads ii) uniformly distributed loads iii) couples and their combinations; Point of contra flexure, point & magnitude of maximum bending moment, maximum shear force.	8	10
4.	Centre of Gravity and moment of inertia Centre of Gravity Centre of gravity of lines, plane areas and volumes, Examples related to centroid of composite geometry, Pappus – Guldinus theorems I and II. Moment of inertia: Derivation of equation of moment of inertia of standard lamina using first principle, Parallel & perpendicular axes theorems, polar moment of inertia and radius of gyration of areas. Examples related to moment of inertia of composite geometry	8	10
5.	Friction Concept of friction, Types of friction, Static and kinetic friction, Cone of friction, Angle of repose, Coefficient of friction, Laws of friction, Application of theory of friction: Friction on inclined plane, ladder friction, wedge friction.	6	6
6.	Simple Stresses & Strains Elastic, homogeneous, isotropic materials, Hooke's law, limit of elasticity and proportionality, yield limit, ultimate strength, section of composite materials, prismatic and non prismatic sections. Stresses: Normal stresses, axial - tensile and compressive, shear and complementary shear, thermal and hoop. Applications to composite material stepped and tapered bars. Strains: Linear, lateral, shear, thermal and volumetric. Elastic Constants: Modulus of elasticity, Poisson's ratio, Modulus of rigidity and bulk modulus and relations between them with derivation.	10	30
7.	Stresses in Beams Flexural/bending stresses Concept of simple bending, Assumptions, derivation of equation of bending, neutral axis, determination of bending stresses, section modulus of rectangular & circular (solid & hollow), I, T, Angle, channel sections. Shear stresses: Derivation of shear stresses formula, shear stress distribution across various beam sections like rectangular, circular, triangular, I, T, angle sections	8	10
Total		45	100



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Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
23	28	49	-	-	-

Where R: Remember; U: Understanding; A: Application; N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT level
1	After successful completion of the course, student will be able to:	Apply
2	Understand and interpret civil engineering drawings.	Apply
3	Understand principles of building planning, principles of architectural planning, building Bye laws, town planning and perspective drawing.	Apply
4	Prepare working drawings, foundation plans and other executable drawings with proper details for residential building	Apply

Course Outcome to Programme Outcome (CO-PO) Mapping

CO-PO Mapping					
PO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-1 Basic Engg Knowledge	3	3	3	3	3
PO-2 Problem Analysis	3	2	2	2	2
PO-3 Design/Development	2	3	3	3	3
PO-4 Investigations	-	-	-	-	-
PO-5 Modern Tool Usage	2	2	2	3	3
PO-6 Engineer & Society	-	-	-	-	-



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Course/ Subject Code: BE106301

Course/Subject Name: MECHANICS OF SOLIDS

PO-7 Environment & Sustainability	-	-	-	-	-
PO-8 Ethics	-	-	-	-	-
PO-9 Individual & Team Work	-	-	-	-	-
PO-10 Communication	1	1	1	2	2
PO-11 Project Management	-	-	-	-	-
PO-12 Lifelong Learning	2	2	2	2	2
CO-PSO Mapping					
PSO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PSO-1 Programming Skills	3	3	3	3	3
PSO-2 Analytical Ability	2	3	3	2	2
PSO-3 Software Tools Use	2	2	2	3	3

References/Suggested Learning Resources:

(a) Books:

1. Building Drawing By M. G. Shah, C. M. Kale and S. Y. Patki ,Tata Mc Graw Hill, New Delhi
2. National Building Code-2005, New Delhi, india.
3. Gurucharan Singh, Building Planning, Designing and scheduling, Standard Book House, New Delhi
4. Y. S. Sane, Planning, designing building, Allies Book Stall
5. Y. N. RajaRao, Planning and Designing of residential building, Standard Publishers.
6. Rangwala, S.C., Town planning, Charotar Publishing House, Anand.
7. G. K. Hiraskar, Town Planning.

(b) Open source software and website:

(d) <http://www.nptel.iitm.ac.in/courses/>

Suggested Course Practical List:



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1. Drawing sheets (A1 Size): Residential Planning: Two storied Building: Plans, elevation, section, lay-out plan, key plan, site plan, area table, schedule of opening. Scale-1:100.
2. Public Building: Ground Floor plan, typical floor plan, elevation, section, lay-out plan, key plan, site plan, area table, schedule of opening.
3. Working Drawing: sheet should accommodate min. five types with sectional details.
4. (Furniture plan, Drainage lay out, Toilet Detail, Wood work detail, Kitchen detail, Electrical plan etc).
5. Perspective Drawing: One Point as well as Two point perspective of sheet -1 planning.

List of Laboratory/Learning Resources Required:

- Working models / Chart of various construction Activities

Suggested Project List:

- 1) Develop a console based application to convert number systems(i.e. . Binary to Decimal, Binary to Octal, etc.)
- 2) Develop a simple calculator.
- 3) Develop console based Countdown timer.
- 4) Print number system table for given range.(Decimal | Binary | Octal | Hexadecimal)
- 5) Develop a fizz-buzz game.
- 6) Develop a program to generate random passwords (8 Digits.).



SWAMINARAYAN UNIVERSITY

Program Name: Engineering

Level: B.E.

Course/ Subject Code: BE106302

/Subject Name: CIVIL ENGINEERING DRAWING & PLANNING

w.e.f.Academic Year:	2022-23
Semester:	3 rd Semester/ 2 nd Year
Category of the Course:	Basic Science Course

Prerequisite:	Civil engineering drawing and planning requires a strong understanding of geometric principles, technical drawing standards, and the ability to accurately represent three-dimensional structures on a two-dimensional plane.
Rationale:	A Civil Engineer has to be conversant with building and town planning and their development controls, skill of preparing drawings of various types like, orthographic, perspective, working drawings etc. using software application.

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/Practical		
				(E)	(M)	(I)	(V)	
2	0	4	4	60	40	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weight age
1.	Introduction Classification of Buildings, Components of buildings, Green Building.	5	10
2.	Principles of Planning Orientation of Buildings, Principles of Building Planning, Principles of Architecture Composition, Building Information Modelling (BIM).	5	10
3.	Fundamentals of Building Drawing and Building bye-laws Introduction to buildings drawings, Brief History of buildings drawings, Interpretation of drawings (Sketch, Diagram and Drawing, Scale Drawing) Interpretation of Working drawings.	10	30



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/Subject Name: CIVIL ENGINEERING DRAWING & PLANNING

4.	Planning of Buildings Drawings and Buildings Services Residential and Public building: Plan, Elevation and section of building, development of detailed plan from key plan, site plan , line diagram , foundation plan ,Area table calculation, furniture lay-out, plumbing and electrical layout, Perspective Drawings.	5	20
5.	Town Planning Town Planning: History, Origin, Principles and Necessity of Town Planning, Town Planning During Pre-independence Period and Post-Independence Period, Types of Growth of Town.	10	30
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
23	28	49	-	-	-

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Course Outcome:

After Completion of the Course, Student will able to:

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1	After successful completion of the course, student will be able to:	Apply
2	Understand and interpret civil engineering drawings.	Apply
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Course Outcome to Programme Outcome (CO-PO) Mapping



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Level: B.E.

Course/ Subject Code: BE106302

/Subject Name: CIVIL ENGINEERING DRAWING & PLANNING

CO-PO Mapping					
PO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-1 Basic Engg Knowledge	3	3	3	3	3
PO-2 Problem Analysis	3	2	2	2	2
PO-3 Design/Development	2	3	3	3	3
PO-4 Investigations	-	-	-	-	-
PO-5 Modern Tool Usage	2	2	2	3	3
PO-6 Engineer & Society	-	-	-	-	-
PO-7 Environment & Sustainability	-	-	-	-	-
PO-8 Ethics	-	-	-	-	-
PO-9 Individual & Team Work	-	-	-	-	-
PO-10 Communication	1	1	1	2	2
PO-11 Project Management	-	-	-	-	-
PO-12 Lifelong Learning	2	2	2	2	2
CO-PSO Mapping					
PSO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PSO-1 Programming Skills	3	3	3	3	3
PSO-2 Analytical Ability	2	3	3	2	2
PSO-3 Software Tools Use	2	2	2	3	3

References/Suggested Learning Resources:

(a) Books:

1. Building Drawing By M. G. Shah, C. M. Kale and S. Y. Patki ,Tata Mc Graw Hill, New Delhi
2. National Building Code-2005, New Delhi, india.
3. Gurucharan Singh, Building Planning, Designing and scheduling, Standard Book House, New Delhi
4. Y. S. Sane, Planning, designing building, Allies Book Stall
5. Y. N. RajaRao, Planning and Designing of residential building, Standard Publishers.
6. Rangwala, S.C., Town planning, Charotar Publishing House, Anand.



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7. G. K. Hiraskar, Town Planning.

(b) Open source software and website:

(d) <http://www.nptel.iitm.ac.in/courses/>

Suggested Course Practical List:

1. Drawing sheets (A1 Size): Residential Planning: Two storied Building: Plans, elevation, section, lay-out plan, key plan, site plan, area table, schedule of opening. Scale-1:100.
2. Public Building: Ground Floor plan, typical floor plan, elevation, section, lay-out plan, key plan, site plan, area table, schedule of opening.
3. Working Drawing: sheet should accommodate min. five types with sectional details.
4. (Furniture plan, Drainage lay out, Toilet Detail, Wood work detail, Kitchen detail, Electrical plan etc).
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- 4) Print number system table for given range.(Decimal | Binary | Octal | Hexadecimal)
- 5) Develop a fizz-buzz game.
- 6) Develop a program to generate random passwords (8 Digits.).



SWAMINARAYAN UNIVERSITY

Program Name: Engineering

Level: B.E.

Course/ Subject Code: BE106303

se/Subject Name: BUILDING CONSTRUCTION & MATERIALS

w.e.f.Academic Year:	2022-23
Semester:	3 rd Semester/ 2 nd Year
Category of the Course:	Professional Core Course

Prerequisite:	Basic construction materials include cement, steel, sand, aggregates, bricks, and blocks, all of which are crucial for structural integrity and stability.
Rationale:	The development of a basic understanding about the construction of different type of Structures and application of the basic principles of Engineering to solve real life problems in construction practices is necessary for civil engineers.

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/Practical		
				(E)	(M)	(I)	(V)	
4	0	2	5	60	40	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weight age
1.	Building Materials Introduction, Properties and Classification of Materials: bricks, blocks, building stones, lime, cement, timber, sand, aggregate, mortar, concrete, tar, bitumen and asphalt, glass, flooring materials, ferrous metals, non-ferrous metals.	9	20
2.	Foundations Subsurface Investigation Shallow Foundation: Necessity, Types, setting out, excavation, construction, failures of foundation, and remedial measures. Deep Foundation: Pile Foundation: Introduction, uses, selection of pile, types of piles.	8	10
3.	Building Construction Stone masonry: Technical terms, joints, Classification of Stone masonry Brick masonry: Technical terms, bonds in brick work, constituents of brick-clay Other Masonry: Composite masonry, Hollow blocks masonry, Partition Wall, Cavity walls Lintels & arches: Lintels Types,	10	30



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se/Subject Name: BUILDING CONSTRUCTION & MATERIALS

	construction. Arches Technical terms, types, construction Wall Finishes: Plastering, pointing and painting Plain and Reinforced Concrete Construction Pre-cast and cast-in-situ Construction, Form work for R.C.C. Wall, slab, Beam and column, Centering for arches of large spans, Slip formwork - Horizontal & Vertical.		
4.	Other Building Components Doors: Location, technical terms, size, types, construction, suitability. Windows: Factors affecting selection of size, shape, location and no. of windows, types, construction, suitability, fixtures and fastenings, Ventilators. Stairs and Staircases: Definition, technical terms, types of steps, classification, stair design/planning, elevators, escalators. Roofs and Roof Coverings: Introduction, requirements of good roof technical terms, classification, types of roof coverings for pitched roof. A.C. sheet roofs Fixing of A.C. sheets, G.I. Sheets roofs, slates, flat roof Advantages, dis-advantages, types of flat terraced roofing.	9	20
5.	Special Treatments Fire resistant, water resistant, thermal insulation, acoustical construction and anti-termite treatment, HVAC & MEP System, Timbering in Trenches, Shoring, Underpinning.	9	20
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
23	28	49	-	-	-

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT level
1	After successful completion of course the students shall be able to:	Apply
2	Discuss sub surface soil strata investigation.	Apply



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3	Construct various types of shallow foundation.	Apply
4	Execute various types of masonry.	Apply
5	Construct various structural and non-structural building components.	Apply
6	Erect various temporary works for new and existing buildings.	Apply
7	Select appropriate method of construction.	Apply
8	Explain causes of failure and remedial measures for foundations	Apply

Course Outcome to Programme Outcome (CO-PO) Mapping

CO-PO Mapping					
PO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-1 Basic Engg Knowledge	3	3	3	3	3
PO-2 Problem Analysis	3	2	2	2	2
PO-3 Design/Development	2	3	3	3	3
PO-4 Investigations	-	-	-	-	-
PO-5 Modern Tool Usage	2	2	2	3	3
PO-6 Engineer & Society	-	-	-	-	-
PO-7 Environment & Sustainability	-	-	-	-	-
PO-8 Ethics	-	-	-	-	-
PO-9 Individual & Team Work	-	-	-	-	-
PO-10 Communication	1	1	1	2	2
PO-11 Project Management	-	-	-	-	-
PO-12 Lifelong Learning	2	2	2	2	2
CO-PSO Mapping					
PSO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5



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se/Subject Name: BUILDING CONSTRUCTION & MATERIALS

PSO-1 Programming Skills	3	3	3	3	3
PSO-2 Analytical Ability	2	3	3	2	2
PSO-3 Software Tools Use	2	2	2	3	3

References/Suggested Learning Resources:

(a) Books:

1. Engineering Materials By S.C. Rangwala ,Charotar Publishing
2. Building Construction by B. C. Punamia
3. Building Construction by Gurucharan Singh
4. Building Construction by P.C Varghese,Prentice-Hall of India, New Delhi
5. Building Construction by Sushil Kumar
6. Hand book of Heavy construction: O'Brien, Havers & Stubb

(b) Open source software and website:

(d) <http://www.nptel.iitm.ac.in/courses/>

Suggested Course Practical List:

1. Site visit
2. Draw the following sketch:
3. Foundations & Setting Out work
4. Masonry Construction
5. Plain and Reinforced Concrete Construction
6. Doors and Windows
7. Stairs and Staircases
8. Floorings
9. Roofs and Roof Coverings
10. Temporary/Special Works
11. Special Treatments

List of Laboratory/Learning Resources Required:

- Working models / Chart of various construction Activities



SWAMINARAYAN UNIVERSITY

Program Name: Engineering

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se/Subject Name: BUILDING CONSTRUCTION & MATERIALS

Suggested Project List:

- 1) Develop a console based application to convert number systems(i.e. . Binary to Decimal, Binary to Octal, etc.)
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- 4) Print number system table for given range.(Decimal | Binary | Octal | Hexadecimal)
- 5) Develop a fizz-buzz game.
- 6) Develop a program to generate random passwords (8 Digits.).



SWAMINARAYAN UNIVERSITY

Program Name: Engineering

Level: B.E.

Course/ Subject Code: BE106304

Course/Subject Name: GEOTECHNICAL ENGINEERING

w.e.f.Academic Year:	2022-23
Semester:	3 rd Semester/ 2 nd Year
Category of the Course:	Professional Core Course

Prerequisite:	A strong foundation in mathematics, physics, and mechanics is essential, along with a bachelor's degree in civil engineering or geotechnical engineering.
Rationale:	Geotechnical engineering is very fundamental subject to study for determination of various soil parameters theoretically and experimentally based on laws of mechanics. Any civil engineering structure needs strong and stable foundation which depends on proper understanding of soil properties and its behavior, determination of stresses and settlements in soil etc. The thorough understanding and implications of geotechnical engineering will play a vital role in strong and economic design of any foundation system for any infrastructural projects. Knowledge of the geotechnical engineering will prepare students to enter into mutli-disciplinary folds of this subject into various other civil engineering schemes.

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/Practical		
				(E)	(M)	(I)	(V)	
4	0	2	5	60	40	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weight age
1.	Type of Soils, Index Properties, Inter-relationships and Soil Characterization Type of Soils ,Index Properties, Inter-relationships and Soil Characterization Types of soil and soil formation, Geological cycle, Phase diagrams, Basic terms, Functional relationships based on index properties, Physical characterization of soil-Dry and Wet sieve analysis, Atterberg's Indices, Soil Structures, Soil Water and its types	10	20



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Course/Subject Name: GEOTECHNICAL ENGINEERING

2.	Permeability and Seepage Darcy's law and its validity, Factors affecting permeability, Laboratory permeability tests, Permeability of stratified soil masses, Seepage pressure, Quick condition, Flow nets.	5	10
3.	Compaction & Consolidation of soil Definitions, Differentiate between compaction and consolidation, Compaction mechanism and proctor tests, field compactions methods, factors affecting compaction, Consolidation mechanism through spring analogy, fundamental definitions, Terzaghi's one dimensional consolidation theory (only formula), Time factor, pre-consolidation pressure, consolidation settlement, Numericals. Tests will be covered in lab sessions.	8	16
4.	Stress Distribution Causes of stresses in soil, Boussinesque's and Westergard's equation, Pressure Bulb, Stress distribution on horizontal and vertical planes, Stresses due to different shapes of footings, New-mark's influence chart, Numericals.	5	10
5.	Shear Strength of Soil Mohr's strength theory, Mohr- coulomb's strength theory, Modified Mohr coulomb's theory, shears parameters through lab and field tests based on drainage conditions, Numericals. Tests will be covered in lab sessions	8	16
6.	Earth Pressure & Stability of Slopes Types of lateral earth pressure, Rankine's and Coulomb's earth pressure, Rebhann's/Culmann's Graphical methods, Infinite and finite slopes, Factor of safety, Type of slope failure, Limit equilibrium method, C-analysis-method of slices, Taylor's stability number, Numericals.	8	16
7.	Introduction to Foundations and Bearing Capacity Shallow Foundations; Types, Basic terms, SBC computation using IS and Terzaghi methods. Deep Foundations; Pile and Pile capacity, Numericals.	8	16
Total		45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
23	28	49	-	-	-



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Where R: Remember; U: Understanding; A: Application; N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT level
1	Classify the soil and will be able to understand its behaviour and will be able to compute/estimate index parameters.	Apply
2	Interpret soil behaviour through learning soil compaction, consolidation, and analyse various theories and calculate parameters needed in design.	Apply
3	Compute earth pressure, stress distributions and FOS for slopes using various graphical and analytical tools for various engineering projects/site.	Apply
4	Differentiate, compare, formulate, and evaluate soil parameters through performing various tests as per site conditions or project needs ethically and professionally.	Apply
5	Suggest suitable type of foundation as per soil type, estimate bearing capacity and demonstrate its socio-economic feasibility.	Apply

Course Outcome to Programme Outcome (CO-PO) Mapping

CO-PO Mapping					
PO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PO-1 Basic Engg Knowledge	3	3	3	3	3
PO-2 Problem Analysis	3	2	2	2	2
PO-3 Design/Development	2	3	3	3	3
PO-4 Investigations	-	-	-	-	-
PO-5 Modern Tool Usage	2	2	2	3	3
PO-6 Engineer & Society	-	-	-	-	-
PO-7 Environment & Sustainability	-	-	-	-	-
PO-8 Ethics	-	-	-	-	-



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Course/ Subject Code: BE106304

Course/Subject Name: GEOTECHNICAL ENGINEERING

PO-9 Individual & Team Work	-	-	-	-	-
PO-10 Communication	1	1	1	2	2
PO-11 Project Management	-	-	-	-	-
PO-12 Lifelong Learning	2	2	2	2	2
CO-PSO Mapping					
PSO \ CO	CO-1	CO-2	CO-3	CO-4	CO-5
PSO-1 Programming Skills	3	3	3	3	3
PSO-2 Analytical Ability	2	3	3	2	2
PSO-3 Software Tools Use	2	2	2	3	3

References/Suggested Learning Resources:

(a) Books:

1. Das Braja M; Principles of Geotechnical Engineering; Thomson Asia Pvt. Ltd.
2. Alamsingh; Soil Mechanics & Foundation Engineering; CBS Publishers & Distributors, Delhi
3. Gopal Ranjan, Rao A.S.R.; Basic and applied soil mechanics; New age int. (p) ltd
4. B.C. Punamia; Soil Mechanics & Foundation Engineering; Laxmi Pub. Pvt. Ltd., New Delhi
5. Arora K.R.; Soil Mechanics & Foundation Engineering; Standard Pub., Delhi
6. Taylor D.W.; Fundamentals of Soil Mechanics; Asia Publishing House, Mumbai
7. Relevant IS Codes

(b) Open source software and website:

(d) <http://www.nptel.iitm.ac.in/courses/>

Suggested Course Practical List:

1. In-situ Density Tests
2. Sieve analysis
3. Atterberg's Limit Test
4. Permeability Tests
5. Proctor Compaction Test
6. Consolidation /Oedometer test



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Level: B.E.

Course/ Subject Code: BE106304

Course/Subject Name: GEOTECHNICAL ENGINEERING

7. Direct Box Shear Test
8. Unconfined Compression Test
9. Triaxial Compression Tests
10. Laboratory Vane Shear Test
11. SPT
12. CBR Test

List of Laboratory/Learning Resources Required:

- Triaxial Compression Test-setup
- Standard Penetration Test -setup

Suggested Project List:

- 1) Develop a console based application to convert number systems(i.e. . Binary to Decimal, Binary to Octal, etc.)
- 2) Develop a simple calculator.
- 3) Develop console based Countdown timer.
- 4) Print number system table for given range.(Decimal | Binary | Octal | Hexadecimal)
- 5) Develop a fizz-buzz game.
- 6) Develop a program to generate random passwords (8 Digits.).



Swaminarayan University

Teaching & Examination Scheme

Course – Faculty of Engineering (Degree)

Branch – Civil Engineering

Semester – 3rd

Subject Code	Subject Name	Category	L	T	P	Total Credit	E	M	I	V	Total Marks
BE100301	Technical Writing & Communication Skills	Humanities and Social Science	2	0	2	3	60	40	20	30	150
BE100302	Indian Constitution	Mandatory	2	0	0	0	50	0	0	0	50
BE106301	Mechanics of Solids	Engineering Science	4	0	2	5	60	40	20	30	150
BE106302	Civil Engineering Drawing and Planning	Engineering Science	2	0	4	4	60	40	20	30	150
BE106303	Building Construction and Materials	Professional Core	4	0	2	5	60	40	20	30	150
BE106304	Geotechnical Engineering	Professional Core	4	0	2	5	60	40	20	30	150
	Total		18	0	12	22					

L=Lecture, T=tutorial, P=Practical, E=Theory External, M=Theory Internal, I=Practical Internal, V=Practical External