



SARVAJANIK EDUCATION SOCIETY

# Sarvajani College of Engineering & Technology

*Towards Progressive Civilization.....*



Dr. R. K. Desai Marg, Opp. Mission Hospital, Athwalines, Surat - 395 001, Gujarat, India.

Ph. : (+91-261) 2240146, 2240147, 2240148 Fax : (+91-261) 2240145,

Email : info@scet.ac.in, Website : www.scet.ac.in

**DULLABH RAMJI BHANABHAI PATEL (DRB)**

## FACULTY OF CIVIL ENGINEERING

No. SCET/FCE/ ૨૭૬ /2021

Date: 14/09/2021

To,

The Members of Academic & Curriculum Committee (ACC) - Civil Engineering Department, SCET.

- |  |  |  |
|--|--|--|
| 1. Dr. Atul Desai<br>Professor,<br>Civil Engg. Dept.,<br>SVNIT, Surat  | 2. Dr. Rajesh J. Pandya<br>Adjunct Professor-SVNIT,<br>Former Deputy Surat<br>Municipal Commissioner   | 3. Dr. Robin Christian<br>Professor, Civil Engg. Dept.,<br>SVNIT, Surat  |
| 4. Er. Nihar Doctor<br>Professional Expert,<br>Envision Enviro<br>Technologies Pvt. Ltd.,<br>New City Light Road, Surat. | 5. Er. Nilesh Shah<br>Consulting Civil &<br>Structural Engineer<br>SHAH Associates,<br>Nanpura, Surat. | 6. Ar. Shyanil Patel<br>Professional Expert,<br>Planning Consultant.<br>"SHAM" House, 5 <sup>th</sup> Floor,<br>Op. Science Centre, Surat. |

Dear Sir,

Greetings.....

We are very much thankful to you for sparing your valuable time for the 1<sup>st</sup> meeting of ACC -Academic & Curriculum Committee dated 09/09/2021.

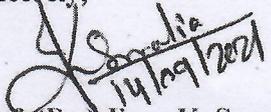
The suggestions given by you all worthy members were very enriching and it helped us to frame our curriculum with the needs of current era.

We have incorporated all the suggestions in curriculum of 1<sup>st</sup> year UG Program and All PG Programs namely Town & Country Planning, Structural Engineering & Environmental Engineering.

The suggestions to enrich 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year Scheme of UG Program will be discussed again in length in subsequent meetings and will be finalized.

We thank you once again and look forward your support to enrich our Academic & Curriculum Activities to benefit the faculties as well as future generation.

Sincerely,

  
Prof. (Dr.) Jigar K. Sevalia  
HOD,  
FCE, SCET, Surat





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## FACULTY OF CIVIL ENGINEERING

The Curriculum Approved for the following Programs:

- 1<sup>st</sup> Year UG Program in Civil Engineering
- PG Program in Structural Engineering
- PG Program in Town & Country Planning
- PG Program in Environmental Engineering

**Dr. Atul Desai**  
Professor,  
Civil Engg. Dept.,  
SVNIT, Surat

**Dr. Rajesh J. Pandya**  
Adjunct Professor-SVNIT,  
Former Deputy Surat Municipal  
Commissioner

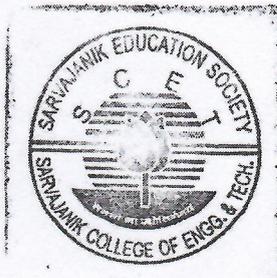
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"SHAM" House, 5<sup>th</sup> Floor,  
Op. Science Centre, Surat.

**Prof. (Dr.) Jigar K. Sevalia**  
Professor & Head,  
Chairman - ACC  
CED, SCET, Surat



**Dr. Hiren H. Patel**  
Principal &  
Dean-Faculty of Engineering  
SCET, Surat



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## FACULTY OF CIVIL ENGINEERING

The Curriculum Approved for the following Programs:

- Curriculum for PhD Entrance Exam in Domain of Civil Engineering
- Detail syllabus of Research Methodology Subject for PhD program (Syllabus might get modified little bit based on other disciplines of Engineering as it is common subject for all the discipline).

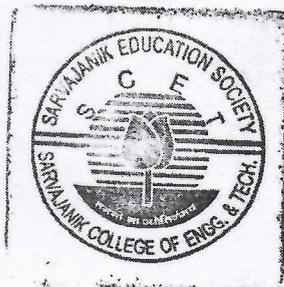
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Chairman - ACC  
CED, SCET, Surat

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SCET, Surat





SARVAJANIK  
UNIVERSITY

INCLUSIVE | INTEGRATED | INNOVATIVE

Sarvajani Education Society

**Sarvajani College Of Engineering & Technology**

Dr. R. K. Desai Marg, Athwalines, Surat – 395001

**Towards progressive civilization.....**



DULLABH RAMJI BHANABHAI PATEL (DRB)

**Faculty Of Civil Engineering**

**Syllabus**

**For**

**PhD Entrance Exam**

**&**

**Research Methodology Subject**

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SARVAJANIK COLLEGE OF ENGINEERING & TECHNOLOGY  
DR. R. K. DESAI MARG, ATHWALINES, SURAT – 395001

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DULLABH RAMJI BHANABHAI PATEL (DRB)

**FACULTY OF CIVIL ENGINEERING**

**Syllabus for PhD Entrance Test**

**STRUCTURAL ENGINEERING**

- **Mechanics: Various System of Forces**, Shear Force and Bending moment in Statically Determinate Beams. Simple Stress and Strain Relationship: Stress and Strain in Two Dimensions, Simple Bending Theory, Flexural and Shear stresses, Principal Stresses, Mohr's circle. Thin walled Pressure Vessels, Torsion, Combined and Direct Bending Stresses, Buckling of Column.
- **Structural Analysis:** Statically Determinate Trusses, Arches, Beams, Cables and Frames, Displacements in Statically Determinate Structures and Analysis of Statically Indeterminate Structures by Force / Energy methods, Slope Deflection Method, ILD for Determinate and Indeterminate Structures, Basic Concepts of Stiffness Matrix and Flexibility Methods
- **Concrete Structures:** Concrete Technology- Properties of Concrete, Mix Design Concepts, Working Stress and Limit State Design Concepts, Design of members subjected to Flexure, Shear, Compression and Torsion by Limit State Methods. Basic Concepts of Prestressed Concrete, Analysis of Beam Sections at Transfer and Service loads.
- **Steel Structures:** Connections - Simple and Eccentric, beam-column connections, Analysis and Design of Tension and Compression members, Beams and Beam-Columns, Column Bases, Plate Girders and Trusses, Plastic Analysis of Beams.

**GEOTECHNICAL ENGINEERING**

- **Soil Mechanics:** Origin of soils, Soil classification, three- phase system, Fundamental definitions, relationship and interrelationships, Permeability & Seepage, Effective stress principle, Consolidation, Compaction, Shear strength.
- **Foundation Engineering:** Sub-surface investigations- scope, Drilling bore holes, sampling, Penetration tests, Plate load test. Earth pressure theories, Effect of water table, layered soils. Stability of slopes. Foundation types-Foundation design requirements. Shallow foundations-bearing capacity, Effect of shape, Water table and other factors, Stress distribution, Settlement analysis in sands & clays. Deep foundation pile types, Dynamic & static formulae, Load capacity of piles in sands & clays, negative skin friction, Terzaghi's Bearing Capacity
- **Ground Improvement Techniques** – Advanced Methods and Material with its Suitability.

**WATER RESOURCES ENGINEERING**

- **Fluid Mechanics and Hydraulics:** Properties of fluids, principle of conservation of mass, momentum, energy and corresponding equations, potential flow, applications of

momentum and Bernoulli's equation, laminar and turbulent flow, flow in pipes, pipe networks. Concept of boundary layer and its growth. Uniform flow, critical flow and gradually varied flow in channels, specific energy concept, hydraulic jump. Forces on immersed bodies, flow measurements in channels, tanks and pipes. Dimensional analysis and hydraulic modeling. Kinematics of flow, velocity triangles and specific speed of pumps and turbines.

- **Hydrology:** Hydrologic cycle, rainfall and its measurement, evaporation, infiltration, stage discharge relationships, unit hydrographs, flood estimation, reservoir capacity, reservoir and channel routing. Well hydraulics.
- **Irrigation:** Duty, delta, estimation of evapo-transpiration. Crop water requirements. Design of: lined and unlined canals, canal regulation structure, waterways, head works, gravity dams, earthen dam and spillways. Design of weirs on permeable foundation. Types of irrigation system, irrigation methods. Water logging and drainage.

### **ENVIRONMENTAL ENGINEERING**

- **Water requirements:** Quality standards, Basic unit Processes and Operations for, water treatment. Drinking water standards, waste water quality measurement, Water requirements, Basic unit operations and Unit processes for Surface water treatment, Distribution of water.
- **Wastewater Characteristics and Treatment:** Sewage characteristics and treatment, Primary, Secondary and Tertiary treatment of Wastewater. Unit operations and Unit processes of wastewater treatment. Industrial wastewater origin, Characteristics, Treatment and Disposal, Sludge handling and disposal, Effluent discharge standards.
- **Air Pollution:** Types of pollutants, their sources and impacts and analysis, Air pollution meteorology, Air pollution control, Air quality standards and limits.
- **Municipal Solid Wastes & Hazardous Waste Management:** Characteristics, Generation, Collection and Transportation of Solid wastes, Engineered systems for Solid waste management (reuse/ recycle, energy recovery, treatment and disposal). Waste management and handling rules.
- **Noise Pollution:** Impacts of noise, Permissible limits of Noise pollution, Measurement of noise and Control of noise pollution.