Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING
(An Autonomous Institution Affiliated to University of Mumbai)

Welcome
Aspiring Engineers to
Civil Engineering UG Programme

Btech in Civil Engineering with Minor

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Head of the Department
Department of Civil Engineering

http://www.spce.ac.in

Outline

- Why Civil Engineering?
- Programmes offered in CED
- Vision and Mission of Civil Engineering Department
- Highlights in past five years
- Curriculum
- Student Achievements
- Faculty Achievements
- Infrastructure
- Employability and Placement
- Reforms and Best Practises

Why Civil Engineering

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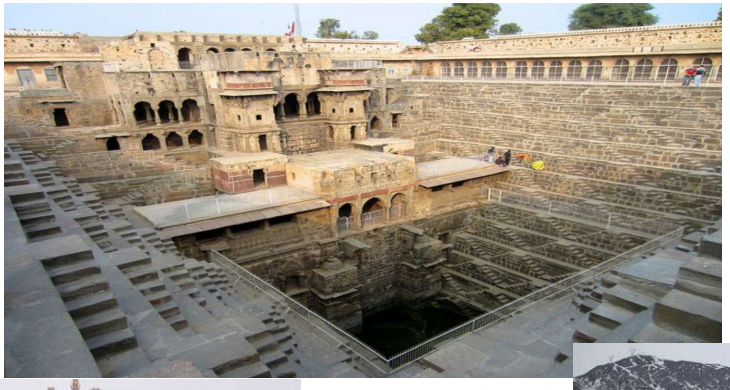

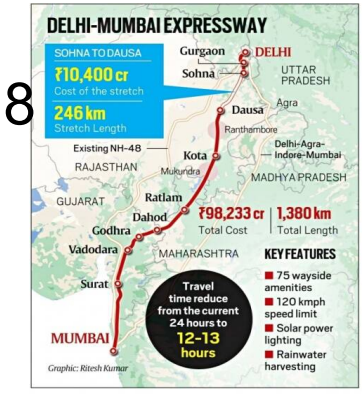

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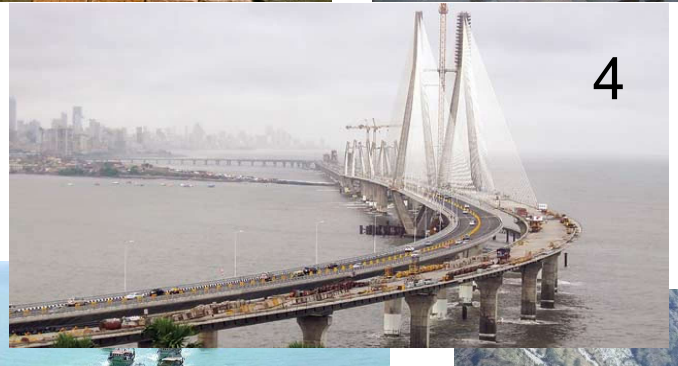

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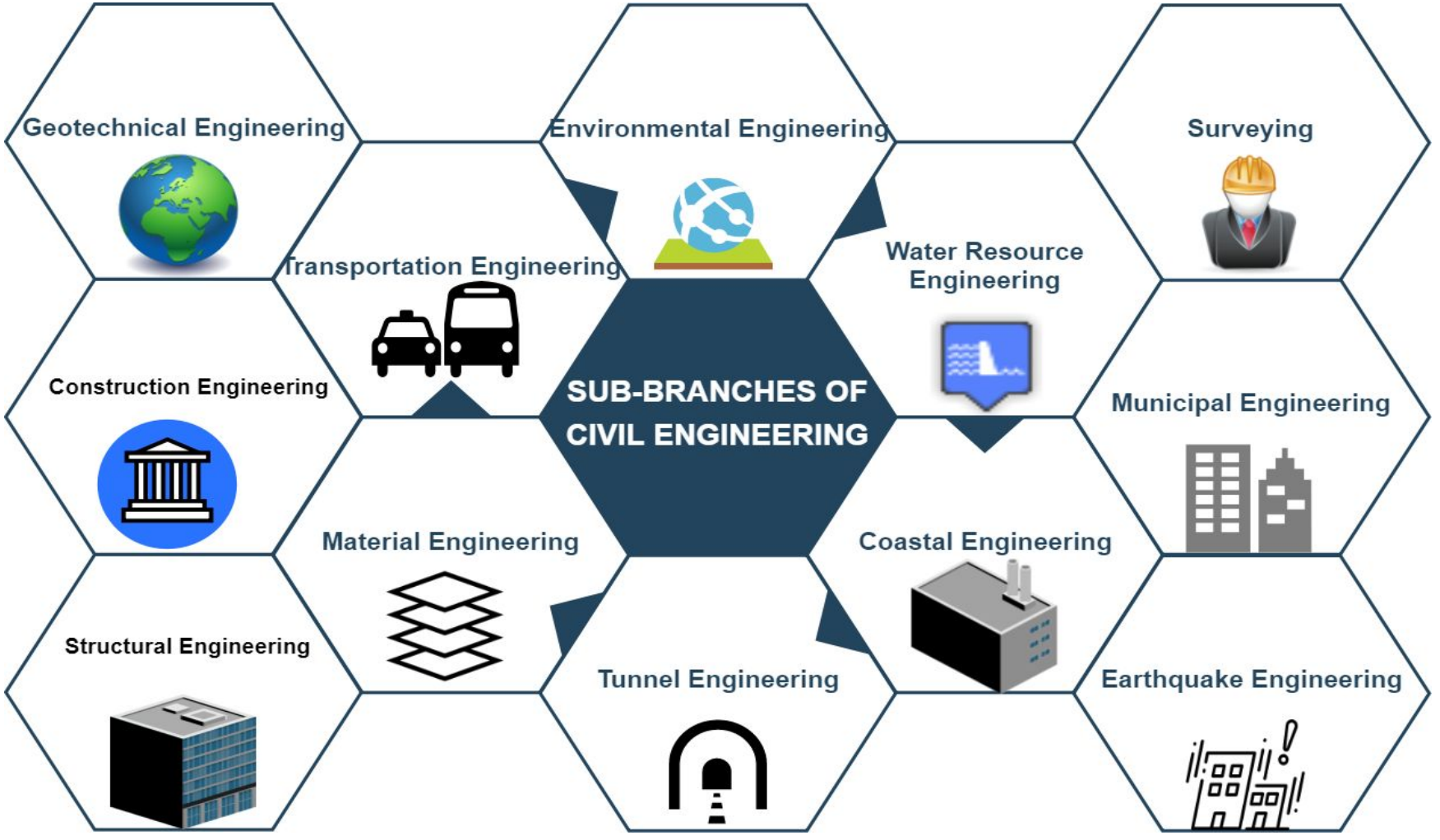
Definition

- Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including public works such as roads, bridges, canals, dams, airports, sewage systems, pipelines, structural components of buildings, and railways

Branches of Civil Engineering



- We lack skilled civil engineers
- The infrastructure sector in India is poised to grow at a CAGR of 8.2% by 2027 (as compared to CAGR 5.7% worldwide) (WEF)
- With close to 1.5 million engineers graduating in India every year, of which the annual pan-India output of civil engineers is estimated at a mere 10,000 per year.
- The country needs approximately 4 million skilled civil engineers on an average, over the next decade, to deliver potential real estate space and planned infrastructure (India Today, 2022)
- Major/Key infrastructural projects undertaken in India are
  - Gati Shakti and Industrial Corridors launched in 2019 (110 lakh crores)
    - To develop infrastructure to improve quality of life
    - Energy, roads, railways and urban project
  - Bharatmala Pariyojana
    - 'Bharatmala Project' of the Ministry of Road Transport and Highways, 34,800 km of national highways will be constructed at a cost of US$ 64 billion (Rs 5,35,000 crores)
  - Delhi Mumbai Industrial Corridor
    - The total sanctioned amount for this program is about US$ 2.4 billion (Rs 20,084 crores). 11 industrial corridor projects have been taken up under the programme, and a total of 30 projects will be developed under the program in four phases by 2024-25

Programmes Offered by CED

Programme	Intake	Year of Starting
B. Tech. Civil Engineering with Minor (NEP)	63	1962
M. Tech. Construction Management	18	2011
M. Tech. Structural Engineering	07/18	1988/1995
Ph. D. Civil	45	2005
Ph. D. Civil, under QIP	02	2012

Vision and Mission of Civil Engineering Department

Vision

To be a pioneering Civil Engineering Department with Regional, National and Global Perspective.

Mission Statements

M1 To impart knowledge in Civil Engineering and allied fields to fulfill the present and future societal and industrial needs.

M2 To produce technically competent and socially responsible Civil Engineering professionals.

Highlights

- Students: Meritorious
- UG programme is accredited thrice earlier/ Curriculum in alignment with NEP 2020 (Process initiated)
- Qualified Faculty, Doctorates (10) from IITs
- Faculty expertise in various fields of Civil Engineering
- Testing and Consultancy in Materials, Structures, Concrete, Water, Soil, Proof Checking, third party audits in Structures, Treatment plant design, storm water drains, Pradhan Mantri Gram Sadak Yojna (PMGSY)
- Department faculty are members of various committees: DTE, University, AICTE, MPSC, PSU, Advisory board members on various committees/Board of Studies
- Faculty members are reviewers of many International Journals
- Contributing in Unnat Bharat Abhiyan (UBA)/Unnat Maharashtra Abhiyan (UMA) activities
- SP Sustainability and Green Initiative Chapter (SPSGIC)
- SPCE Green Club and ASCE student chapter (Starting this year)
- IIRS – ISRO Outreach Programme

NEP Framework

Level	Qualification title	Credits		Sem	Year	Condition/ Remark
		Min	Max			
4.5	UG Certificate in [Major]	40	44	2	1	Additional 8 credits at exit
5.0	UG Diploma in [Major]	80	88	4	2	Additional 8 credits at exit
5.5	B. Vocational in [Major]	120	132	6	3	Additional 8 credits at exit
6.0	B. Tech in [Major] with Minor in [Multidisciplinary*]	160	176	8	4	*courses from different disciplines of engg or faculty
	B. Tech Honors in [Major] with Minor in [Multidisciplinary*]	180	194	8	4	5-6 additional courses in same engg discipline CPI >7.5 in sem II
	B. Tech Honors with research in [Major] with Minor in [Multidisciplinary*]	180	194	8	4	Research project of 18 credits in final year CPI>7.5 in sem VI
	B. Tech in {Major} with Minor in [Multidisciplinary*] and [Specialization]	180	194	8	4	5-6 additional courses another engg discipline /emerging areas CPI>7.5 insem II

Minors

- Sustainability Engineering and Management
- Infrastructure Management
- Geo-informatics Technology

Curriculum

COURSE TYPE	REPRESENTATION	CREDITS	
		Min 160	Max 176
Major core + core electives	PCC PEC	80	88
Basic science + Engineering science	BSC ESC	22	30
Multidisciplinary Minor	MIC	14	14
Open Electives	OE	8	8
Vocational Skill Courses	VSC	4	4
Skill Enhancement Courses	SEC	4	4
Ability Enhancement Courses	**AEC**	**4**	**4**
Indian Knowledge System	**IKS**	**2**	**2**
Value Education Courses	**VEC**	**4**	**4**
Internship	**INT**	**12**	**12**
Field project/ community engagement project	**FP/CEP**	**02**	**02**
Co curricular	**CC**	**04**	**04**

Student Achievements (UG)

Top three rankers (GATE)

- **Sonal Deo (AIR 452)**
- **Ketan Dharme (AIR 475)**
- **Gazanfar Ali Khan (AIR 634)**

Higher studies GRE/TOEFL

- **Anup Subhash Kotekar**
- **Devesh Chetan Patil**
- **Kishan Sanjay Singh**
- **Karan Ajay Desai**
- **Gaurav Patil**
- **Vedant Singh**
- **Nidhi Sonar**
- **Prashant Limaye**

Muneesh Sharma: Short service commission/qualified in Defence

Shruti Sheth from B. Tech. Civil participated in the **Solar Decathlon,** Her team **Tejasvi** (A team of 14 students coming from different academic institutes around India) secured **1st prize** in the Community Resilience Shelter sector with a memento and a cash prize of Rs. 30,000 from Minister of State for Science and Technology and Earth Science.

Shubham Bhaisare	**UPSC Examination (IAS) (2021)**

Achievements

Participant	Event/Exams	Achievement
Shivam Shailendrakumar Bhangale	Participated in "Dr.APJ Adbul Kalam Space Research Payload Cubes Challenge – 2021" - an event of launching 100 Femto satellites in a single high altitude scientific balloon which includes 4 world records.	Acknowledged by the India Book of Records, World Book of Records, Asia Book of Records
Suverna Khade and team	Waste 2 Wealth Ideatho organized by NEC's innovation Incubation Centre (Supported by Maharashtra State Innovation Society, Government of Maharashtra)	1st runner up
Rameshwar Garkal	Monoact competition – K J Somaiyya	1st Prize
Rameshwar Garkal	Monoact competition - VJTI	2nd Prize
Dakshata Patil	Running – 400m, 800m – VJTI (2019, 2020)	1st Prize
Meghana Nilange	Boxing, University Championship (2022)	2nd Prize
Dakshata Patil	Constructo – SPECTRA (2022)	1st Prize
Mayank Nagrale	Spoorthi – Cricket - SPIT(2020)	1st Prize
Ankit Kondilkar	Constructo – SPECTRA (2020)	2nd Prize
Shruti Sheth, Sonal Deo, Prashant Limaye	SPICON Conference	1st Prize and 2nd Prize
Ayush Jaiswal	Spoorthi – Cricket - SPIT(2020)	1st Prize

Some Distinguished Alumni

- Dr Mhaiskar (1976), Pro VC, NMIMS University
- Dr PH Sawant (1977), Former Director, Walchand CoE
- Dr Lokesh Padhye (2000), Associate Professor, University of Auckland, New Zealand
- Dr. Srinidhi Balasubramaniam (2008), Asst Prof., IIT Bombay
- Dr. Kartik Balasundram (2005), Asst Prof, VNIT.
- Dr. Sushrut Vaidya(2005), NASA
- Dr. Abhinav Guha (2006), Principal Air Quality Engineer, California
- Mr Mohit Nawany (2007), Director, ASL Logistics
- Mr Yashesh Gandhi (2008), Director, CMG Construction
- Ms. Khyati Sonpal(2007), Director, Pentacle Construction
- Preeti Chauhan (2012), Director, Little Green World
- Madhav Bhagwat (2006), Director, 2000watt Smart City Assoc., Zurich
- Yogita Pawar (2001), Additional GM, Technimont

Faculty Achievements

Faculty	Achievement
Dr. M. M. Murudi/ Dr. A. A. Bage	Member of Expert Review Panel (ERP) of MCGM, workshops organised, Consultancy
Dr. P.P. Nagrale	Pradhan Mantri Gram Sadak Yojna (PMGSY), Twining activity with Rewa
Dr. A. R. Kambekar	Editor for a book titled “Sea Level Rise, Are we Ready”; Collaborative research/Guidance/Research Projects on Prediction of durability of concrete with sustainability in coastal region in association with Monash College Monash University, BoS Mumbai University; Interview panel for several colleges, twining activity; Consultancy
Dr. P. G. Gaikwad	Pradhan Mantri Gram Sadak Yojna (PMGSY), Twining activity with Rewa
Dr. H.S Jeswani	EIA consultant for Konkan Expressway and Pune Ring RoadMentor for SINE IIT Bombay, KIIT Bhubhaneshwar, IIT Delhi for the BIRAC Grant since 5 years; IGBC Accredited Professional; Interview panel for several colleges, workshops organised
Dr. Reshma Raskar Phule	Coordinator – Indian Institute of Remote Sensing (IIRS) –Indian Space Research Organization Outreach Network Center ; Resource Person, National Geospatial Program (NRDMS), Department of Science and Technology (DST), Government of India – from 2016, consultancy

Faculty Achievements

Faculty	Achievement
Dr. A. N. Ghadge	Received Financial Sanction of the research project from DST SERB titled Application of bio-electrochemical system for electrocoagulation and development of Anion exchange membrane using clay minerals: Total cost of Rs. 45,89,284/-; PMGSY; Twining Activity; Consultancy
Dr Kshitija Nadgouda	Completed PhD from IIT Bombay ; Consultancy related to Soil
Prof. Snehjit Kumbhar	Organised seminars and activities of CEA; Consultancy

An combined experience of around 270+ years for the faculty members in Civil engineering department is a plus point for our civil engineering department

Departmental Infrastructure

- Classrooms
- Tutorial / Elective Rooms
- Laboratories
  - Geotechnical Engineering
  - Transportation engineering
  - Environmental Engineering
  - Hydraulic Engineering
  - Fluid Mechanics
  - Geology
  - Surveying
  - Geoinformatics
  - Computer Center
  - Engineering Mechanics
  - NDT Lab
  - Material Testing Lab
  - Concrete Lab
- Civil Engineering Department Office (113)

Environmental Engineering

Location : Room No 122
Budget for each year: 1.5 lakhs

The primary objective of this lab is to demonstrate environmental engineering testing procedures for the subjects of Environmental Engineering I and II and for the electives such as solid waste management and Industrial waste water treatment.

It covers the four major pollution areas: air, wastewater and water and solid waste management. Students contribute through various undergraduate and postgraduate projects in the lab.

Hydraulic and Fluid Mechanics Laboratory

Hydraulic lab help the students to

Explore the fundamental principles of fluid mechanics through experimentation.

Demonstrate and analyze key hydraulic phenomena using hands-on physical devices and computer modeling.

Investigate engineering design principles for pipe networks, open channel systems, and ground water regimes.

Develop skills for analyzing experimental data and working in teams.

Learn to design a custom hydraulics experiment.

Location : Room No 15

Budget for each year: 1 lakhs

Surveying Laboratory

Location : Room No 118
Budget for each year: 1.5 lakhs

- The tools used by surveyors have evolved tremendously. Engineering, especially civil engineering, depends heavily on surveyors.
- They establish the boundaries of legal descriptions and the boundaries of various lines of political divisions.
- With respect to the importance of surveying in construction field, our survey lab is kept well equipped with latest instruments. This particular instrument can be used for conducting survey project of road, railway, bridges or buildings.

Geotechnical Engineering Lab

Location : Room No 54
Budget for each year: 0.5 lakhs

- Geotechnical engineering Laboratory is one of the pioneer laboratories in Maharashtra for all Geo-technical testing and consultancy works.
- Various works related to Geo-technical and foundation investigations are carried out in this laboratory
- This laboratory can be very useful for experiments related to soil for pavement subgrade, subbase

Engg. Geology Laboratory

Location : Room No 117
Budget for each year: 0.5 lakhs

Geology lab is important for civil engineers as it is the basis of geotechnical Engineering and students after completing the lab :
Able to apply geologic concepts and approaches on rock engineering projects.
Able to identify and classify rock using basic geologic classification systems.
Able to use the geologic literature to establish the geotechnical framework needed to properly design and construct heavy civil works rock projects.

Transportation Engineering Lab

Location : Room No 13
Budget for each year: 0.75 lakhs

To find characteristics of materials used in road (aggregates and bitumin)

Base and subbase property

Operations and management involve traffic engineering, so that vehicles move smoothly on the road or track

In order to obtain insight related to transport and traffic engineering , transport lab is equipped with all modern equipments

Computer Centre

Location : Room No 120
Budget for each year: 1 lakhs

- A computer lab is provided for UG and PG students
- Common computing facility is required in each department for the betterment of students who can't access internet at home.
- Licensed MSProject, ArCGIS, SewerGEMS, WaterGEMS, MATLAB, ANSYS, MXROAD and StormGEMS are installed on few of the computers .
- No of Computers available= 30

Facilities in Laboratories

Sr. No.	Name of the Laboratory	Number of students per set up (Batch Size)	Name of the Important Equipment
1	Hydraulics/ Fluid Mechanics	20	**Turbines**
2	Surveying Lab.	20	**Total station**
3	Environmental	20	**AAS, Spectrophotometer**
4	Geo-Informatics	20	**GRAM++, ARCGIS**
5	Transportation	20	**Aggregate Impact test**
6	Soil Mechanics	20	**Triaxial Test Equipment**
7	Mechanics of Material	20	**100 T UTM**
8	Engineering Geology	20	**Various types of samples**
9	Concrete Tech.	20	**300 T CTM**
10	Dynamics Lab.	20	**Shake Table**
11	Engineering Mechanics	20	**All expt. models**
12	Computer Lab.	40	**40 Computers**

Softwares available:

- **Midas/ABAQUS/ANSYS/ETABS/ SAP/SAFE**
- **ArcGIS licenses - basic, standard and advanced and GRAM++ /MSP-Primavera/AUTO**

- SMART Board
- Online platforms
- SMART Projectors

Safety measures in laboratories

Special Laboratory-
SERB-DST Funded Research Lab

SERB - DST Funded Research Project

FILE NO.: EEQ/2021/001115

Application of Bio-electrochemical System for Electrocoagulation and Development of Anion Exchange Membrane Using Clay Minerals

Total Cost of Project: 45.89 Lacs

Duration of Project: 16th March 2022 to 15th March 2025

Objectives:

- To design novel system Architecture for Multi-electrode single chambered MFC for simultaneous organic removal and electrocoagulation.
- To evaluate the effect of operating parameters such as organic loading rate (OTR), external resistance, concentration of dissolve salts on electrocoagulation.
- To investigate the feasibility of anion and cation exchange membranes using clay blended with ion exchange minerals and its application for microbial desalination cell.
- To determine optimum ratio of electrode to IEM surface area for maximizing desalination.

Expected Outcomes:

Proposed research aimed at developing the new technology to address the problem of water pollution, fresh water scarcity, clean energy for making sustainable development.

It is primarily focused on removal of colloidal as well as the suspended particles present in industrial waste water and developing the a cost effective ion exchange membrane by replacing the high cost material and technology. The major outcome of this research is the development of Cation and Anion exchange ceramic membrane using clay mineral ion exchangers.

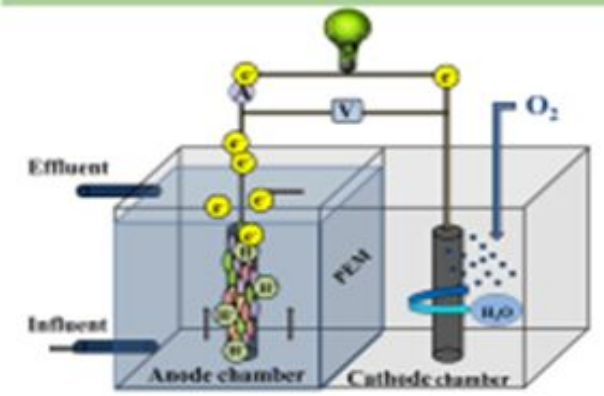


Fig. 1 Schematic Representation of Microbial Fuel Cell

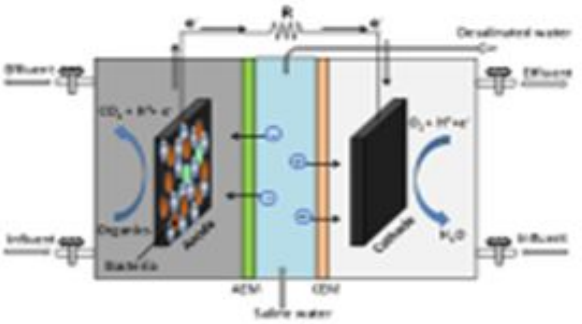


Fig. 2 Mechanism of Desalination

Employability in Future

Fastest Growing fields

- AI and ML Specialists
- Sustainability Specialists
- Infrastructure Engineers
- Information security Analysts
- Data analysts
- Robotics Engineer
- Electrotechnology
- Agriculture Equipment Operators
- Digital Transformation Specialists

Placements

Item	(2019-20)	(2020-21)	(2021-22)
Total No of Final Year Students(N)	78	73	**72**
No of students placed in the companies or government sector(X)	44	38	**27**
No of students admitted to higher studies with valid qualifying scores(GATE or equivalent State or National Level tests, GRE, GMAT etc.) (Y)	17	12	**12**

- Typical Packages are between 5.5 lakhs to 7.8 lakhs for CED students in core Civil Engineering branch

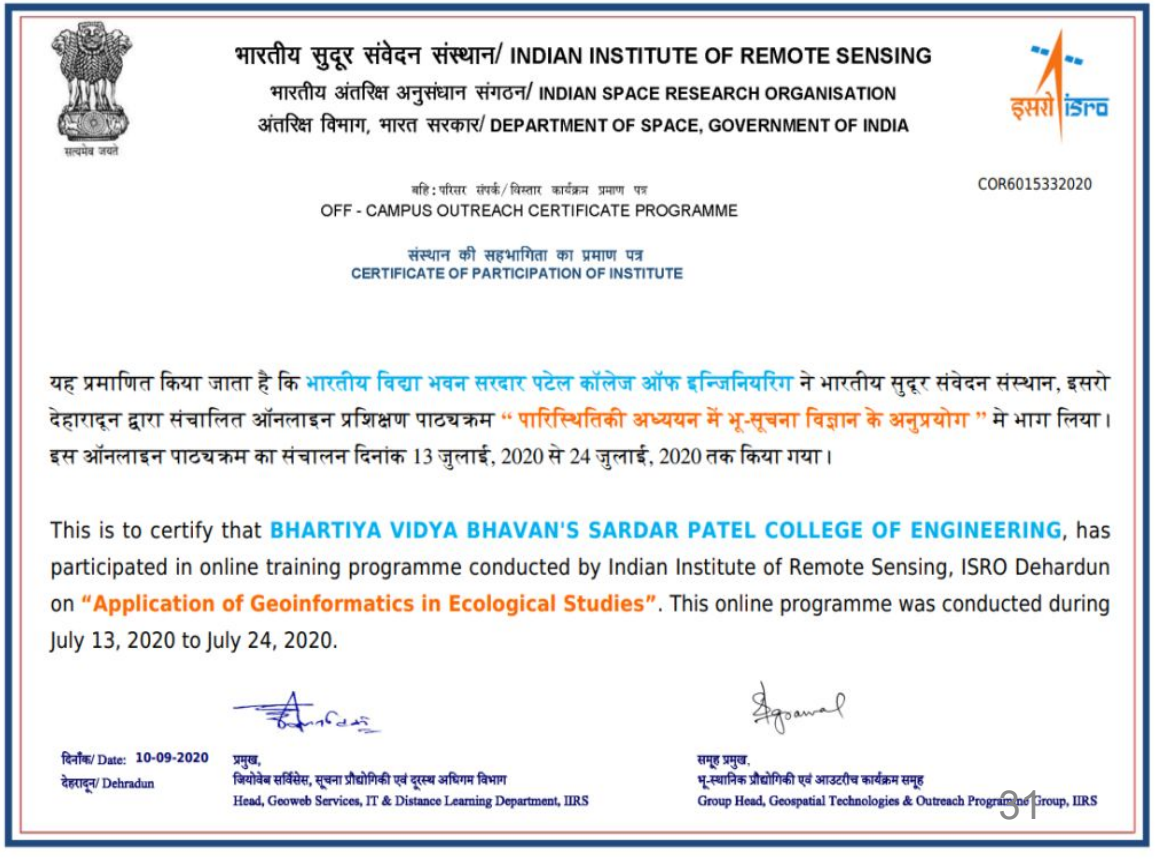
Reforms and Best Practices

- Clubs/ Initiatives
  - ISRO OUTREACH
  - CEA
  - SPSGIC
  - UMA/UBA
- Mentorship programme
- Examination reforms

IIRS – ISRO OUTREACH PROGRAMME

- **Conducted 40 Edusat program: Remote Sesning (RS), Geographic Information System (GIS), Global navigation Satellite System (GNSS), Image processing, Digital elevation Modelling (DEM) and its Applications.**

- **More than 1000 participants from SPCE, other institutes and industries**



CEA activities

CEA CUP
FRIENDLY SPORTS COMPETITION

CLASH WITH CONCRETE

AUTO CAD WORKSHOP
TO IMPART NEW TECH KNOWLEDGE

IFAT VISIT
OPPORTUNITY TO MEET REAL INDUSTRY

INDUSTRIAL VISIT TO STP, COLABA

CEA TREK , निसर्गवेध

WINTER TRIP TO MAKE MEMORIES TOGETHER

SP Sustainability and Green Initiative Chapter (SPSGIC)

1. Student volunteers after the drive

Students of SPSGI Chapter: performing cleanup drives at Versova Beach.

The logo making competition for the Chapter was organized by the SPSGIC on 17th Nov 2021

Indian Green Building Council

Several activities such as visits and seminars carried out under IGBC chapter of Civil Engineering Department

Unnat Maharashtra Abhiyan/ Unnat Bharat Abhiyan (UBA/UMA)

Photographs·¶

SN .	Name of Activity
1	Attendance during flag hoisting at Dahagaon
2	Interaction with Village Gram panchayat officials at Ganeshpuri

Mentorship

- Each year one mentor is allotted to look after the student performance and interaction with parents if required
- Mentorship book (Soft form)

Examination/test

- Transparency- Paper seeing and changes before declaration of results
- Synoptic answer paper

Thank You

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