



# **BITS Pilani Hyderabad Campus Department of Chemical Engineering**



**BITS Pilani**  
Hyderabad Campus

PhD Admission 2022-23, Semester II

# The Legacy of BITS Pilani

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***Birla Institute of Technology and Science, Pilani*** is a dream come true of its founder late Mr. G. D. Birla - an eminent industrialist, a participant in Indian freedom struggle and a close associate of the Father of Nation late Mahatma Gandhi. During its 50 years of existence as an institute of higher learning, BITS Pilani has expanded beyond Pilani to three more campuses at ***Dubai, Goa*** and ***Hyderabad***. BITS has just launched its fifth Indian campus, the BITS School of Management, in Mumbai. Today, BITS offers UG, PG and Ph.D. programs to over 17,000 students in various disciplines including Science and Engineering.



The Late Shri G. D. Birla

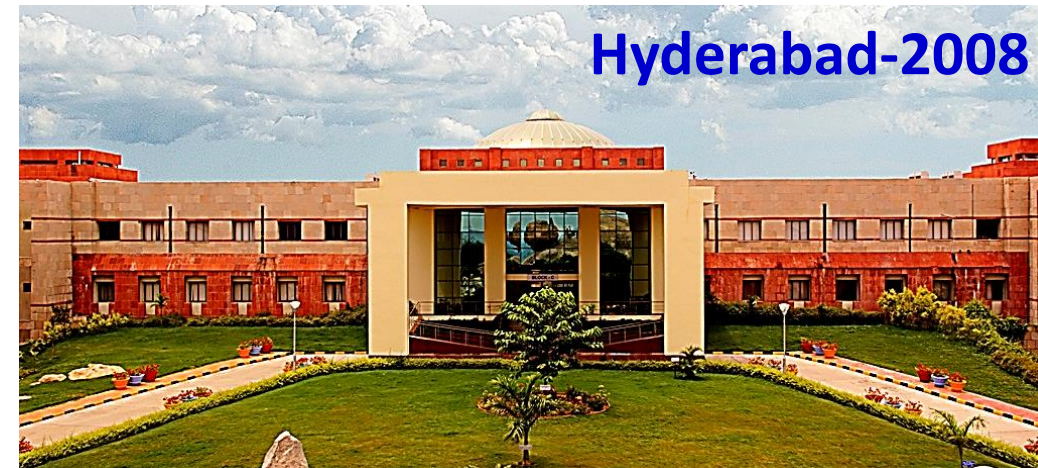
***ज्ञानम परमं बलम: Knowledge is Supreme Power***

# BITS Pilani Campuses

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# BITS Pilani – Where we stand now

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Declared as **Institute of Eminence** by the Govt. of India in 2020

Nature Index India 2020 Rank **#9** in Physical Sciences category

NIRF 2021 Rank **#17** in University category

QS Asia University Rankings 2021: Only private Institute from India in **Asia Top 200**

QS World University Rankings by Subject 2022: Chemical Engineering

**301-350 in the World and 11<sup>th</sup> in India**

# BITS Pilani Hyderabad Campus (BPHC)

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BPHC was established in the year 2008. The sprawling campus is built amidst lush greenery spreading over 200 acres of land at Jawahar Nagar, Shameerpet, Hyderabad. Surrounded by natural beauty, the campus is about 70 km away from Rajiv Gandhi International Airport and 27 km from Secunderabad railway station.



# BITS Pilani Hyderabad Campus

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The campus is built with state-of-the-art infrastructure, modern laboratories, well-furnished classrooms, lecture theatre complexes, student activity center, auditorium, and playground all come together to make BPHC a well-equipped campus. BPHC is fully residential, housing over **5000 students**, around **250 faculty members** and **250 technical and support staff**.





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# Department of Chemical Engineering, BPHC

**MISSION:** To develop new talents, leaders, researchers and entrepreneurs who can bring high level value addition to the Chemical & Allied industries and to the Academia

**WHAT WE OFFER:** Bachelors (B.E), Masters (M.E) and Ph.D. programmes

## OUR STRENGTH:

**Our students** who get placed in reputed companies, join esteemed institutes for higher education, become successful entrepreneurs

**Our 16 faculty members** who are actively working in cutting edge research to address challenges in Energy, Environment, and Healthcare

**Our research facilities** and **external funding** from Government agencies and Industries

# Message from our HOD, Prof. I. Sreedhar

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Dear Aspirants,

Since establishment in 2008, the Department of Chemical Engineering has been running integrated first degree, higher degree and Ph.D. programmes. Our department boasts of highly qualified faculty with diverse research profiles, state of the art labs, flexible and industry relevant curriculum, strong university-industry linkage, excellent academic infrastructure besides lush green 200 acre campus.



Besides departmental labs, we have well-equipped Central Analytical Laboratory that houses various sophisticated instruments like SEM, XRD, XPS, NMR, FTIR, LC-MS, AAS, DSC, DTG, TGA, HPLC, etc. to cater to the needs of our research community. We are progressing well in terms of the research outcomes viz., publications in international journals, sponsored projects, patents etc. and strive hard to be one of the best Chemical Engineering Departments in the country in near future. Our campus is a part of BITS Pilani University standing 17<sup>th</sup> as per NIRF rankings 2021 and top most private university in the country. So, be a part of this journey and you will have a great satisfying experience towards the end of the programme. Good luck!



# Our Faculty

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**[Prof. Jaideep Chatterjee](#)** (Ph.D., Illinois Institute of Technology, Chicago)

Professor

Area of research: Water & waste-water Purification, Air Purification, Oil-water Interfaces, Capillarity, Porous media characterization, Surfactants, Foams & Emulsion



**[Prof. I. Sreedhar](#)** (M.Tech, IIT Delhi; Ph.D., BITS Pilani)

Professor and HOD

Area of research: Catalysis, Reaction Engineering, Environmental Chemical Engineering.



**[Prof. Srikanta Dinda](#)** (Ph.D., IIT Kharagpur)

Professor

Area of research: Heterogeneous Reactions & Catalysis, Synthetic & bio-polymer synthesis, CO<sub>2</sub> capture & utilization, Hydrocarbon cracking



**[Prof. Balaji Krishnamurthy](#)** (Ph.D., University of South Carolina, USA)

Associate Professor

Area of research: Energy systems, Batteries, Fuel cells, Microbial fuel cells, Computational & Experimental



**[Prof. A Ramesh Babu](#)** (Ph.D., BOKU, Vienna, Austria)

Associate Professor

Area of research: Pulp & Paper technology, Polymers & Composite Materials, Characterization of Fibres & Composites



**[Prof. Karthik Chetan V](#)** (Ph.D., McMaster University, Canada)

Associate Professor

Area of research: Material science, Biomaterials, Tissue engineering



**[Prof. D. Purnima](#)** (Ph.D., IIT Delhi)

Associate Professor

Area of research: Waste utilization, Natural fibre reinforced composites, Synthetic fiber based materials, Polymer blends, Nanomaterials, Water remediation



**[Prof. Vikranth Kumar Surasani](#)** (Ph.D., Otto von Guericke University Magdeburg, Germany)

Associate Professor

Area of research: Lattice Boltzmann Methods, Modelling & Simulation for Reactive Transport, Pore Network for Drying of Capillary Porous media.

# Our Faculty

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**Dr. Satyapaul Singh Amarthaluri** (Ph.D., IISC Bangalore)

Assistant Professor

Area of research: Heterogeneous Catalysis, Photocatalysis, Clean Energy, CO<sub>2</sub> Sequestration



**Dr. Nandini Bhandaru** (Ph.D., IIT Kharagpur)

Assistant Professor

Area of research: Nanotechnology, Soft Lithography, Superhydrophobic surfaces, Polymer thin films.



**Dr. Pankaj Kumar** (Ph.D., IIT Hyderabad)

Assistant Professor

Area of research: Biofuels, Bio-refinery, Heterogeneous catalysis, Reaction Engineering



**Dr. Arnab Dutta** (Ph.D., National University of Singapore)

Assistant Professor

Area of research: Process Simulation, Process Integration, Optimization, Machine Learning, Techno-economic Assessment, Sustainable Energy Systems



**Dr. Afkham Mir** (Ph.D., IIT Delhi)

Assistant Professor

Area of research: Energy storage devices, 2D materials, Graphene, Energy harvesting, Electrochemical engineering, Supercapacitors



**Dr. Debirupa Mitra** (Ph.D., National University of Singapore)

Assistant Professor

Area of research: Surface modification, Antimicrobial coatings, Materials for biomedical applications



**Dr. Lyman Abrar** (Ph.D., IIT Delhi)

Assistant Professor

Area of research: Emulsions & microemulsions, Sustainable alternative fuels, Performance evaluation of IC Engine, Interfacial engineering



**Dr. Ramendra Kishor Pal** (Ph.D., Virginia Commonwealth University)

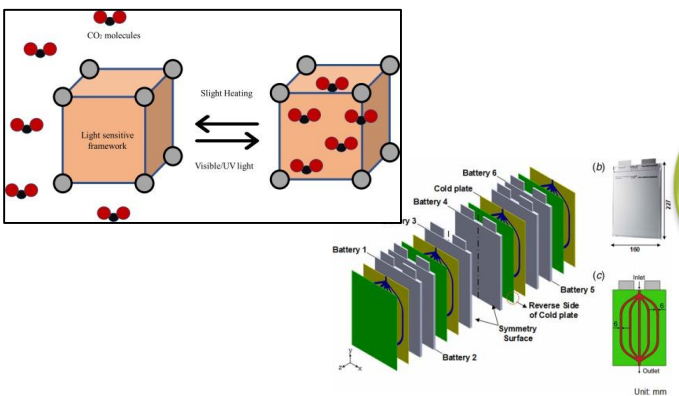
Assistant Professor

Area of research: Biomaterials, Biochemical sensors, Soft electronics, Plasma medicine, Cold Plasma-based disinfection of pathogens

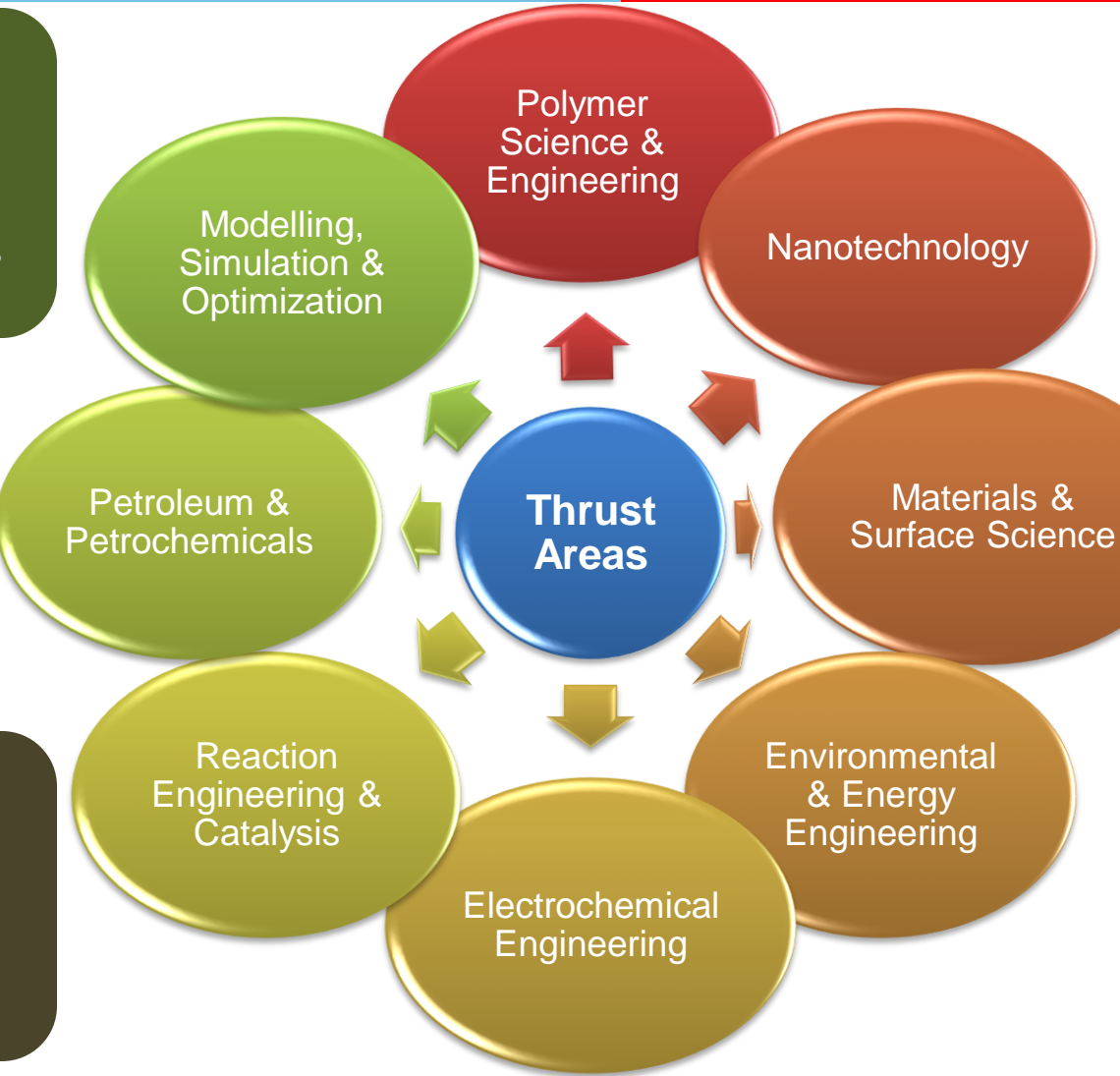
# Research in Chemical Engineering, BPHC



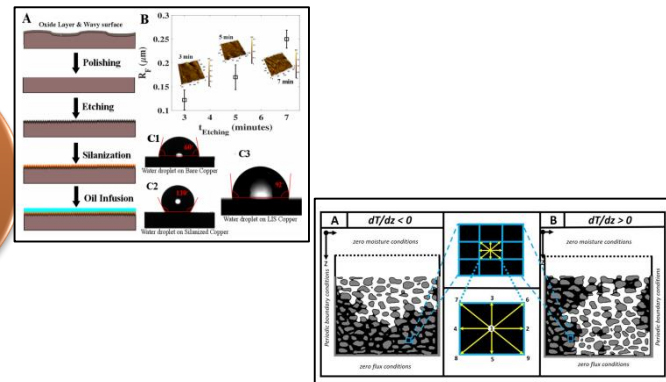
Reactive Transport Modelling  
 Lattice Boltzmann Methods  
 Process Optimization  
 Machine learning & Surrogates



Fuel cells & Li-ion batteries  
 Alternative fuels  
 Endothermic fuel development  
 Heterogeneous Catalysis  
 Nanocatalysis



Fiber reinforced polymers  
 Layered materials  
 Patterned surfaces  
 Surface modification  
 Biosensors

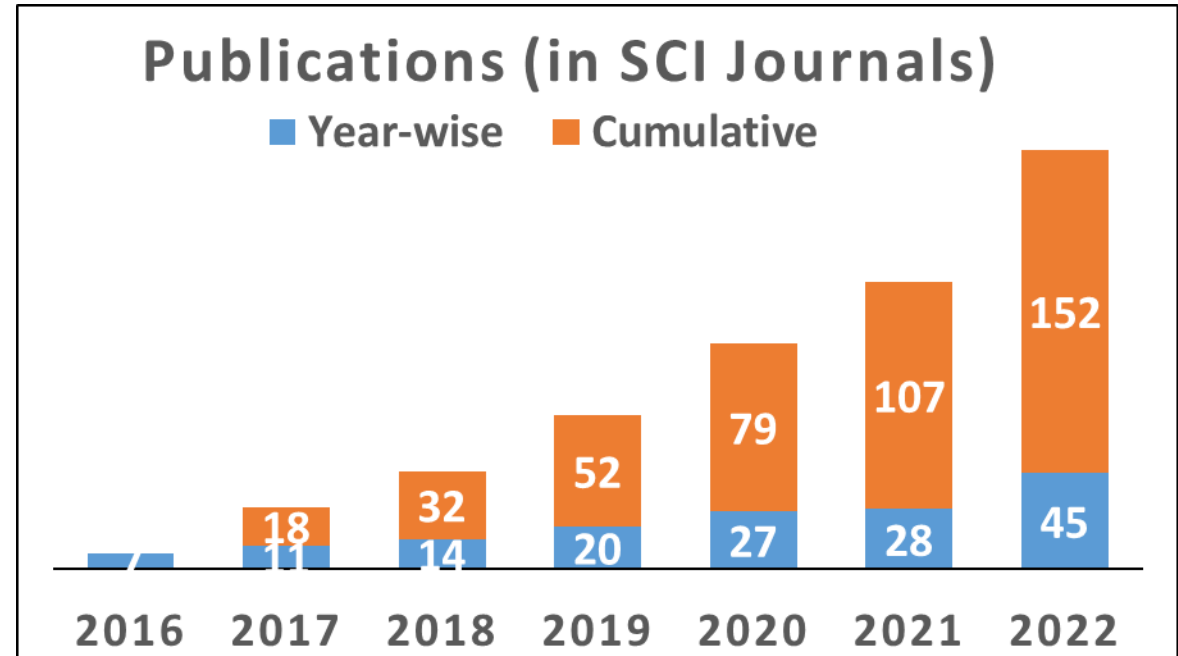


Membrane Separation  
 Heavy Metal Removal  
 Carbon Capture  
 Interfacial Engineering  
 Biomass valorization

# Research Accomplishments: Publications



- Motivated and dedicated faculty members provide a dynamic, outstanding hands-on learning experience for students
- Publications in esteemed journals like *Langmuir*, *Chemical Engineering Science*, *Journal of Cleaner Production*, *Journal of CO<sub>2</sub> Utilization*, *Catalysis Science & Technology*, *Soft Matter*, *Drying Technology*, *Journal of Materials Science*, *Carbohydrate Polymers*, etc.

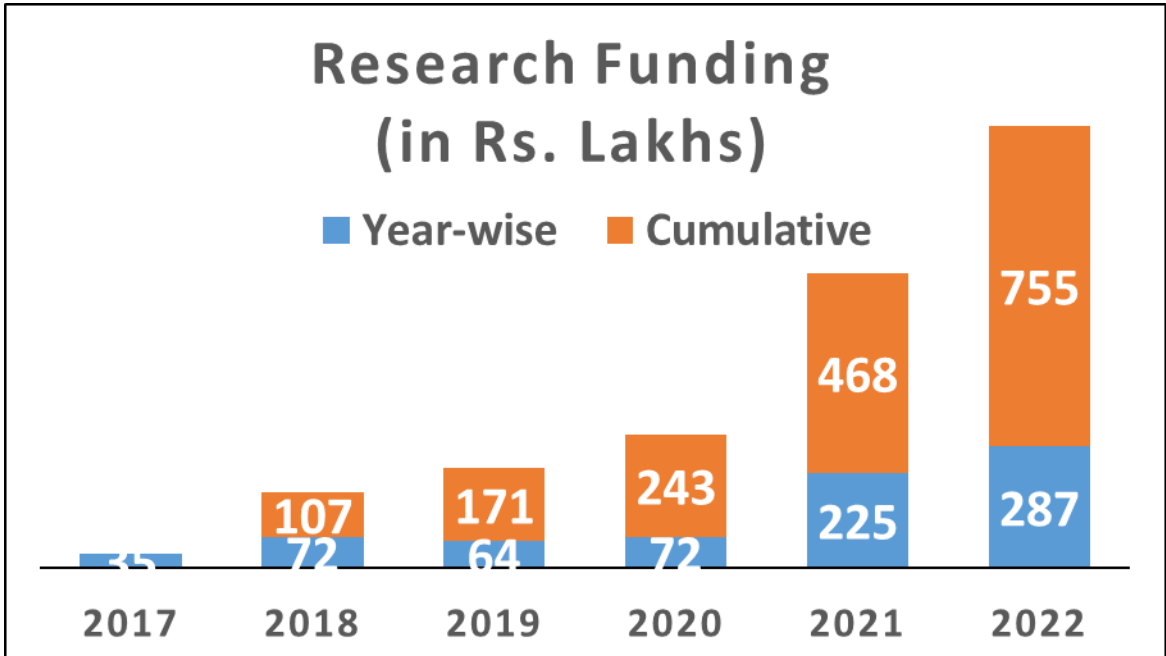


**Average Impact Factor (Last 5 years): 4.6**

**Total Conference proceedings in last 5 years: 74**

# Research Accomplishments: Funded grants

- **>7.5 crores (including FIST grant)** worth externally funded research grants received in the last 5 years
- Consultancy projects received in last 5 years: **128 lakhs** from DRDO, HBL Power Systems Limited, Ardee Hytech
- No. of research projects: **25**
- External grants sponsored by **CSIR, DST, SERB, DBT, DRDO**
- Our ongoing projects are listed [HERE](#)



The Department of Chemical Engineering has been sanctioned an amount of **Rs. 135 lacs** from **DST** under the Fund for Improvement of Science & Technology (FIST-Level-1)

# Departmental Facilities

(More are listed [HERE](#))

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Contact Angle Meter



Micro gas Chromatography



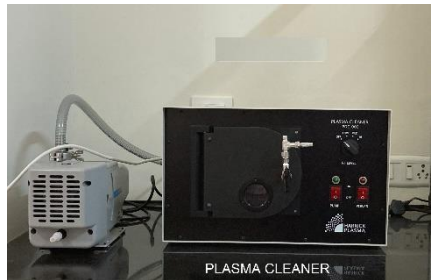
Potentiostat



BET Surface Analyzer



Automated Distillation Column



Plasma Cleaner



Liquid Chromatography



Super Mass colloidier



UV-VIS spectrometer



Fixed Bed Reactor



Rheometer



Microtome



Electrospinning Unit



Melt Flow Index tester



High pressure Parr reactor

Software available:  
ANSYS-CFD, COMSOL,  
MATLAB, ASPEN

# Central Analytical Lab, Hyderabad

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The [CAL@Hyderabad Campus](#) boasts of State-of-the-Art research equipment



**Thermal Gravimetric Analysis – Differential Scanning Calorimetry**



**X-ray Photoelectron Spectroscopy**



**Impedance /Gain-Phase Analyzer**



**Field Emission SEM**



**SAXS/WAXS System with dual detector**

# Central Analytical Lab, Hyderabad

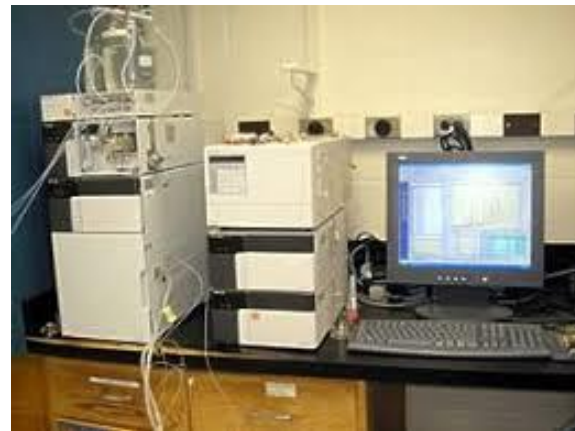
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**Powder XRD**



**High Performance Liquid Chromatography**



**Atomic Absorption Spectroscopy**



**Laser Scanning Confocal Microscopy**



**Universal Testing Machine**



**Energy Dispersive XRF**



**Liquid chromatography-Mass spectrometry**



# PhD Programme: Why BITS?

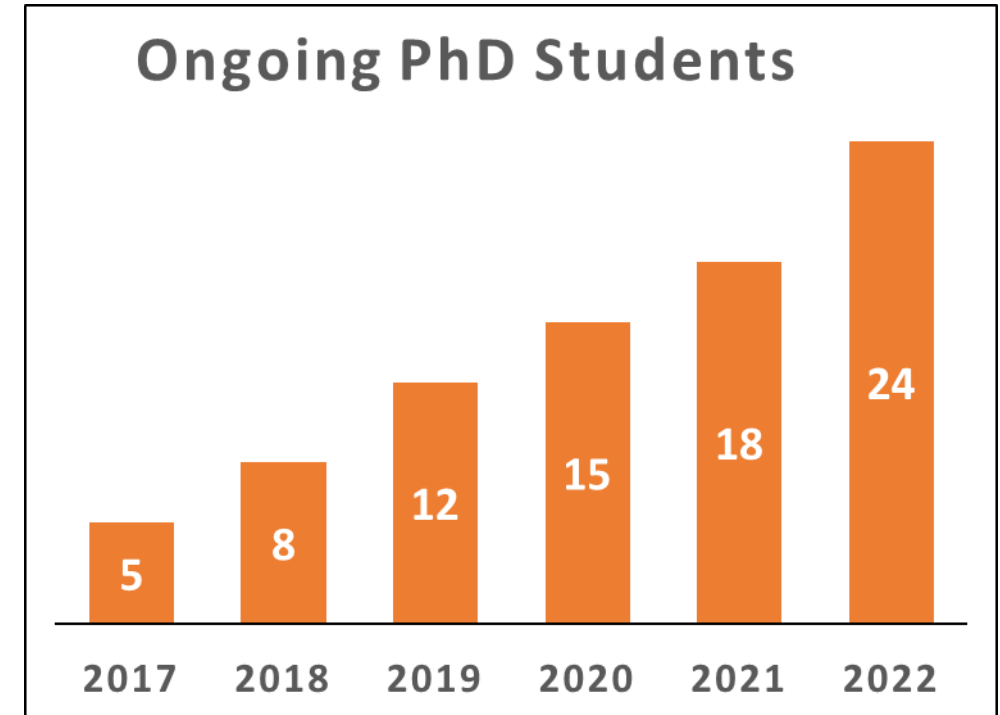


- ❖ **BITS: An Institute of repute with good research infrastructure**
  - An Institution Deemed to be University estd. vide Sec.3 of the UGC Act,1956 under notification # F.12-23/63.U-2 of Jun 18,1964; NAAC –Accredited (Yes): A grade; DSIR certificate (Yes)
- ❖ **Qualified faculties from diverse research areas**
- ❖ **Attractive PhD Fellowship to all full-time students**
  - PhD students admitted with higher degrees receive INR 31000 per month + annual contingency with the possibility of enhancement to INR 35000 per month after two years based on research progress
  - PhD students admitted without higher degrees receive INR 28000 per month + annual contingency which is increased to INR 31000 per month + annual contingency after completing the relevant coursework
- ❖ **Exposure to cutting-edge research and prospects of high-impact publications**
- ❖ **Access to over 600 scientific equipment for research**
- ❖ **Participation in national & international conferences**
- ❖ **Vibrant campus life**

# PhD Programme: Overview



- The PhD Programme lasts 6-10 semesters
- Currently, we have **24 ongoing PhDs**
- Our Research Scholars are working on diverse research topics like *Reaction Engineering, Catalysis, Electrochemical Engineering, and Modelling, Simulation & Optimization, Polymer Engineering, Environmental Engineering, Material Science & Engineering, and Nanotechnology.*



No. of PhDs awarded during last 5 years	
Full Time	Part Time
6	2

# PhD Programme: Full-time & Part-time



	Full-time	Part-time
<b>CRITERIA</b>	Required to devote full-time for PhD on campus	Candidates working in organizations situated in close vicinity of Campuses. Need to visit campus at regular intervals
<b>ELIGIBILITY</b>	M.E./M.Tech./M.Pharm. or an equivalent degree with a minimum of 60% aggregate in the qualifying examination OR M.Sc./B.E./B.Pharm. or an equivalent degree with a minimum of 60% aggregate in the qualifying examination	M.E./M.Tech./M.Pharm. or an equivalent degree with a minimum of 60% aggregate in the qualifying examination. M.Sc./B.E./B.Pharm. or an equivalent degree with a minimum of 60% aggregate in the qualifying examination will be considered based on suitability and competence
<b>ADMISSION PROCEDURE</b>	Shortlisted candidates will be called for a written test and/or interview for selections	
<b>FINANCIAL SUPPORT</b>	Financial assistance in the form of fellowship of any government agency or of the Institute. Student has to participate in teaching/ developmental activities of the Institute	No financial assistance available

\*[PhD Aspirant scheme](#) also available for Industry-sponsored candidates

# PhD Programme: Major Activities



Course work completion (for students without higher degree)

PhD Qualifying exam (After 1 year for those without higher degree; within 1 year for those with higher degree)

Research Proposal (within 3-6 months of Qualifying exam)

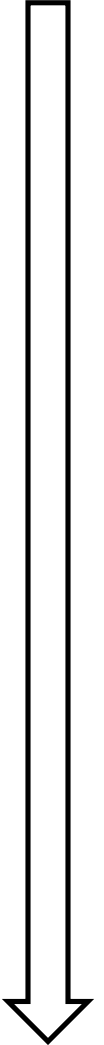
Thesis Registration

Pre-submission draft & seminar

Thesis Title approval

Thesis Submission

PhD Viva-Voce



# PhD Programme: Semester-wise structure



For those with M.Sc./B.E./B.Pharm. or an equivalent degree

Year	First Semester	Units	Second Semester	Units
I	Course 1 Course 2 Course 3	Min 10 Max 14	Course 4 Course 5 Course 6	Min 10 Max 14
<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     Total min. units required: 24; Min. CGPA: 5.5                 </div>				
II	BITS C797T Ph. D Seminar BITS C791T Teaching Practice I	1 1	BITS C797T Ph. D Seminar BITS E661 Research Methodology I (RM-1)	1 1
III	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1
IV	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1

# PhD Programme: Semester-wise structure



For those with M.E./M.Tech./M.Pharm. or an equivalent degree

Year	First Semester	Units	Second Semester	Units
I	BITS C797T Ph. D Seminar BITS C791T Teaching Practice I	1 1	BITS C797T Ph. D Seminar BITS E661 Research Methodology I (RM-1)	1 1
II	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1
III	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1	BITS C799T Ph. D Thesis BITS C797T Ph. D Seminar	10 1

Students with higher degree may also be required to do courses if recommended by Supervisor

# PhD Programme: Qualifying Exam & Research Proposal



- Each PhD student must clear qualifying examinations (scheduled twice a year) in two areas from the [list of qualifying examination areas](#)
- For those without higher degree, student must complete coursework before appearing for qualifying exam
- After qualifying examination, student, in consultation with his/her notional supervisor and the Doctoral Advisory Committee (DAC) members will decide upon the topic & prepare a research proposal and present it in writing and orally before the DAC members. After approval by Doctoral Counseling Committee (DCC) through Dean, AGSRD, the student formally becomes eligible to register in the Ph.D. thesis course.

# PhD Programme: Thesis Submission



- For submitting thesis, 40 units of PhD thesis course, 2 units of PhD Seminar, 2 units of Teaching Practice course are to be completed by the candidate
- To complete minimum 40 units of PhD Thesis course, and to be eligible to submit the thesis, normally takes 4 semesters after the DCC has approved the proposal. However, mere completion of 40 units does not make someone entitled for the submission of thesis
- Upper time limit of 10 semesters starting from date of first registration in the programme is there for submission of thesis. 2 annual extensions are possible with approval of DCC. After 14 semesters though, the candidate will be discontinued from the programme and has to seek fresh admission.



# Information



- ❑ Details on Application can be found at:  
<https://www.bitsadmission.com/phdmain.aspx>
- ❑ For more information on PhD guidelines, please check: <https://universe.bits-pilani.ac.in/hyderabad/agsrd/GuidelinesandProformas>
- ❑ For more information on the Department of Chemical Engineering, BITS Pilani Hyderabad Campus, please check: [Department Brochure](#)

## Contact Details:

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**Phone: 040-66303512**