

Bachelor of Technology

specialising in
Climate Change

4-year, full-time,
undergraduate engineering
programme



"The world is heading towards a climate crisis. The most vulnerable populations of the world will be the most severely affected by it. To mitigate this, industries across sectors including us at Piramal Group realise that industry needs to adapt production processes and products to be climate resilient. There are also increased international and national regulatory pressures on industry to measure, disclose, and improve business parameters that impact climate. There are therefore great opportunities for technological advancements. However, where are the skills to do this? AnantU has been a pioneer in climate education by establishing the highly coveted Anant Fellowship for Climate Action 3 years ago. AnantU is now offering a 4 year Bachelor in Technology degree specialising in Climate Change starting August 2022. This will be India's first undergraduate degree focusing on climate technologies."



Mr. Ajay Piramal
President, Anant National University
Chairman, Piramal Group



"B.Tech students specialising in Climate Change at AnantU will learn to use engineering tools and design thinking principles for creating technology solutions for climate change. The program has the most talented faculty to teach and a state of the art Climate Lab. Students will work on industry projects starting from the 1st semester itself, to get them job-ready for the \$23 trillion global climate industry."

Dr. Pramath Raj Sinha
Founding Provost, Anant National University
Founder and MD, Harappa Education and 9.9 Group
Founding Dean, ISB, India

"The reasons and implications of climate change in India and certain other emerging nations differ from those in the rest of the world. Thus there is a need for a specialised climate studies programme that gives a regional context. It is important to train students to find and implement solutions, and develop technologies to adapt to and mitigate climate change for India as well as other parts of the developing world."



Dr. Anunaya Chaubey
Provost, Anant National University
Former Deputy Dean, Young India Fellowship



"Measuring, predicting, mitigating and adapting to climate change needs an influx of new technologies as well as millions of people skilled in the use of existing and new ones. We are glad to establish India's first undergraduate degree related to climate as this will effectively move our country and the world closer to the goal of zero-emission. I invite students to become engineers who solve for climate change, and request parents to support the students in their unique choice of this job-oriented and specialised engineering degree offered by AnantU."

Dr. Miniya Chatterji
Founding Director, Anant School for Climate Action
Chief Executive Officer, Sustain Labs Paris



For individuals determined to create technology-driven solutions for climate change.



Looking for specialisation in climate technologies and their application in industry, government, advanced research.



To become engineers who solve for climate change

Do you recognize yourself in this? Please apply to join the Bachelor of Technology specialising in Climate Change!

Bachelor of Technology

specialising in Climate Change

4-year, full-time, undergraduate engineering programme

The unique B. Tech degree at AnantU is a specialised engineering program specifically for innovating in climate technologies. It is the only undergraduate degree program in India offering students to specialise in climate technologies and thus be part of the \$23 trillion climate economy globally.

Students learn to use engineering tools and design thinking principles with practical application-oriented learning at AnantU's Climate Lab, within industry, government, research laboratories for creating technology solutions for climate change.

International immersions

Massachusetts Institute of Technology (MIT), USA

All students of the Bachelor of Technology programme specialising in Climate Change will be members of MIT Solv[ED]. An initiative of the Massachusetts Institute of Technology (MIT), USA, MIT Solve[ED] is an invite-only community chosen to drive MIT Solve's mission to drive innovation to solve world challenges. MIT Solv[ED] equips people under the age of 24 with knowledge, tools, and resources to practice problem identification and solution design. Solv[ED]'s approach prioritizes experiential learning, accessibility, and community-building among young problem-solvers. Learn more about MIT Solv[ED] here <https://solve.mit.edu/solv-ed>.

- During the 2nd semester of the 1st year of their studies (February 2023 for the incoming cohort), students will attend an online course conducted by MIT for 8 hours a week.
- During the 1st semester of the 2nd year of their studies (September 2023 for the incoming cohort), all students will receive micro grants amounting to a total disbursement of INR 400,000 for initiating social projects related to climate change solutions.
- Students will receive coaching and incubation support from MIT Solv[ED] to lead their projects.

The exposure that our students of the Bachelor of Technology specialising in Climate Change get from the Massachusetts Institute of Technology will support their engineering skills for jobs in the booming climate industry.

Sustain Labs Paris, India /UAE/ New Zealand/ France

The Bachelor of Technology specialising in Climate Change at Anant National University has mandated Sustain Labs Paris for 100% placements of all students in India and internationally. Sustain Labs is an enterprise based in India, UAE, and New Zealand that partners with organisations to make them more environmentally and socially responsible as well as profitable. In India, Sustain Labs' annual flagship ranking of India's 200 most sustainable companies is published by India's largest selling business magazine, and places Sustain Labs at the centre of India's transition to a net zero economy. Sustain Labs works with large global companies as well as government, start ups, universities, and development projects on establishing new institutions, organisation transformation, building infrastructure, scientific research, sustainability strategies to move towards net zero. Students of the Bachelor of Technology specialising in Climate Change at Anant National University will be placed in jobs across Sustain Labs' clients and associations in India and abroad.

Learn more about Sustain Labs Paris here <https://www.sustainlabsparis.com>.

Faculty Members

Dr. Diana Mangalagiu

Ph.D, Artificial Intelligence, Ecole Polytechnique
Honorary Research Associate & Professor, University of Oxford
Board member, Global Climate Forum



Dr. CN Tripathi

Ph.D., In Climate Change from the Department of Geophysics,
Banaras Hindu University, Varanasi.
Master's degree in Geophysics, Banaras Hindu University,
Varanasi.
B.Sc., Banaras Hindu University, Varanasi.



Dr. Rohan Dutta

Ph.D., Cryogenic Engineering, Indian Institute of Technology,
Kharagpur
B.Tech, Instrumentation Engineering, Haldia Institute of
Technology, West Bengal



Dr. Arpita Bose

Ph.D., Microbiology, University of Illinois Urbana-Champaign
Founder, Bose lab, Washington University in St Louis, USA
L'Oréal USA Woman in Science Fellow



Kartik Desai

Masters in International Affairs (International Finance &
Business), SIPA, Columbia University
B.Sc. Economics (Finance & Management), Wharton
School, University of Pennsylvania
Founder & CEO, Desai & Associates



Dr. Aditya Parekh

Ph.D. in Cancer Biology, IIT Kharagpur



Dr. Purnima Mehrotra

Ph.D., Development Communication, University of Kentucky



The urgent need for engineers specialising in climate technologies

At the COP-26 meeting in 2021, Prime Minister Narendra Modi pledged that India will reach net-zero level of emissions by 2070. In order to fulfill this commitment, the country will require experts in the field. For instance, despite running the world's largest clean energy programme, India has a domestic manufacturing capacity of only 3 GW for solar cells and 15 GW for solar modules and heavily depends on imports from China. People need to be trained to find and implement such technical solutions to adapt to and mitigate climate change.

Further, India is both a major greenhouse gas emitter and one of the most vulnerable countries to projected climate change. The reasons and consequences of the changing climate in India and some other developing economies are different from those of the rest of the world. The need for new technologies, technical research and engineering in this field in India is therefore critical. Hiring people with these skills will be crucial for companies, government, the scientific community in India and the world.

Increasing compliance regulations demand organisations to be climate resilient. There is no organisation that will not need to be transformed. These organisations need skilled engineers to transform products, services and processes to be climate positive. There is an urgent need for engineers skilled in climate technologies in India and the world.

How can technology mitigate climate change?

Technologies help us measure, simulate, predict, climate scenarios. Across sectors, technologies can help reduce greenhouse gases and capture carbon. Technology is crucial to also establish renewable energies such as wind energy, solar power and hydropower. Further, there are also technologies for climate repair, improving air quality and energy efficiency. Most solutions for mitigating or adapting to climate change requires supportive technologies.

Eligibility to apply

High school graduate, having studied 3 of the following in classes XI and XII: computer sciences, mathematics, physics, chemistry, biology.

All Indian and international high school boards are accepted. There is no bar on the age of applicants.

Minimum scores

- **Indian boards (CBSE, ISC, and State boards):** 70% average of best of 4 subjects in Class XII (40% marks for candidates belonging to reserved category)
- **Cambridge A levels and IGCSE:** A, A*, B, AB, B (no C grade and below)
- **IB:** 30/42 (33/45)
- **International applicants:** Please write to us if you have any doubt about your eligibility.

Please note that the above mentioned scores are the eligibility criteria of candidates and does not guarantee admission into the Bachelor of Technology specialising in Climate Change programme. Candidates will be selected based on the best combination of motivation and examination scores.

Required documents

- **Letter of motivation**
The letter should answer these questions: Why do you want to join the programme? What are your interests and experiences related to climate action, environment, sustainability?
- **CV:**
Your resume should help us know who you are outside the classroom as well
- **High school marks/grades of Classes X, XI and XII.** If Class XII examination results are not out, results of 1st semester/ pre-board examination will be accepted.

Career opportunities

The Bachelor of Technology specialising in Climate Change at Anant National University has mandated Sustain Labs Paris for 100% placements of all students in India and internationally.

The job opportunities for engineers specialising in climate technologies is extremely vast. The candidates with this degree can get jobs in both public and private sectors as well as academia. There is a surge of demand for climate engineers yet the supply of talent is very little. Approximately 1,20,000 people globally, and less than 5,000 people in India, are formally trained to adequately cater to the \$23 trillion global climate industry opportunities expected until 2030.

According to the IFC, India and Bangladesh together are expected to attract \$ 2.5 trillion worth opportunities related to climate-resilient infrastructure. The IFC projects that in India alone, there is a potential to create 3 million renewable energy jobs by 2030. The World Economic Forum also supports the tremendous scope for jobs in the climate industry by forecasting that India’s transition to a green economy could potentially create 50 million jobs by 2070 representing upwards of a \$15 trillion economic opportunity.

Electric bus with ‘battery swap’ technology developed by SUN Mobility



About the programme

The 4-year undergraduate engineering degree is a super-specialisation in climate change.

Students will learn to build technology solutions for mitigating or adapting to climate change, use specialised software for simulating climate impact and be part of live industry climate projects at the Climate Lab since day one of joining. They will have the chance to specialise in using climate technologies for business or policy, as well as a deeper specialisation in climate technology itself. The final semester is a mandatory industry immersion where students are placed within the \$ 23 trillion climate industry co-guided by an industry and an academic guide.

The curriculum is designed such that every semester 1 - 6 offers an incremental step across 8 climate technology streams as well as applied research in the Climate Lab. The final 2 semesters offer the opportunity to students to take courses they earlier might have not been able to pass or take, and focus on specialisation and then full industry immersion.

Emphasis on industry experience

Leveraging design thinking for creating technology solutions for climate change

Climate Lab

Year 1	Year 2	Year 3	Year 4
Climate Lab industry projects			Industry experience

YEAR 1

Climate engineering tools

Semester 1 and 2

Students will be part of Foundation Year courses at AnantU that introduce them to climate change and technical drawing. They will gain expertise in climate engineering tools and introduced to key concepts such as earth and space system evolution, biogeochemical cycles, basics of geo-engineering, climate finance asset management, climate and energy, amounting to course work of 20 credits. 4 credits are attributed to applied research projects in the Climate Lab.

YEAR 2

Application

Semester 3 and 4

Students will learn to apply the tools they have gained expertise in the previous semester. They will also gain understanding of meteorology and atmospheric sciences, pollution aquatic systems, solar-terrestrial relations, financial products origination, environmental policies. They will be introduced to behaviour sciences and will learn to leverage design thinking for innovative solutions in climate action.

While the aforementioned course work will amount to 20 credits, 4 credits continue to be attributed to applied research projects in the Climate Lab. Students will have the opportunity to receive international exposure through opportunities like visits to the MIT, USA campus, attending massive open online courses (MOOCs) offered by MIT, USA and availing micro-grants awarded from MIT, USA.

YEAR 3

Technology solutions for climate change

Semester 5 and 6

Equipped with tools and having learnt to apply them to climate solutions, students will now focus on creating technology solutions for climate change through courses amounting to 20 credits. They will learn how to make climate predictions, do space weather modelling, create and scale up clean energy technologies. They will be encouraged to understand the context of developing economies and create technology solutions especially adapted to these regions.

Continuing with the emphasis on industry experience, 4 credits are attributed to applied research projects in the Climate Lab during semester 5 and 6 as well.

YEAR 4

Specialisation

Semester 7 and 8

In Semester 7, students will pursue 320 hours of specialisation training in any of the three: climate in business, climate law and policy, climate technologies.

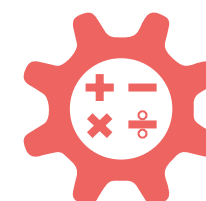
In semester 8, every student will be placed on industry projects. They will work on live climate technology projects within external organisations, co-guided by an academic and industry partner. This will make for a smooth transition of the student from university to the surge of jobs within the \$23 trillion climate industry.

There are 8 streams through semester 1—6

Each stream will have 6 incremental steps across 6 semesters



Climate simulation



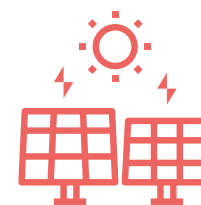
Engineering mathematics



Environmental engineering



Climate chemistry



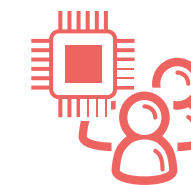
Energy and technology



Climate finance



Design thinking and behavioral science



Technology and society

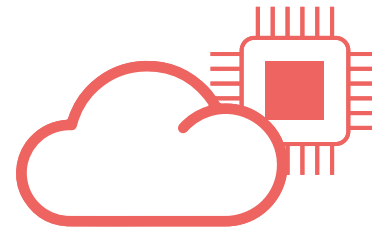
In semester 7, the students get 320 hours of specialisation by choosing amongst



Climate in business

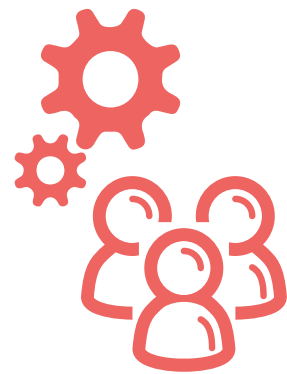


Climate law and policy



Climate technologies

In semester 8, the students get 16 weeks of experiential learning with industry partner on climate projects.



Selection process and deadlines

- Submission of online application by **15 September 2022**.
- Call for an online interview on a rolling basis 1 May onward. The interview will assess your motivation and the fit between your profile and the programme.
- The offer letter will be sent to successful candidates within 10 days of the interview.
- Candidates given an admission offer will need to block their seat by paying ₹30,000 within 10 days of receiving the offer.

Know Your Faculty



Dr. Diana Mangalagiu

Diana holds a PhD in Artificial Intelligence from Ecole Polytechnique and pursued postgraduation in Science with specialisation in Physics. She also has two postgraduate degrees in social sciences with specialisation in Sociology and Management. She is a Professor at the Environmental Change Institute, University of Oxford and Neoma Business School, France.

Diana has over two decades of experience in research, teaching and advising on sustainability, long-term planning, risk governance. She is an expert in the articulation of environmental and economic policies in corporate and public policy settings, addressed through modelling, stakeholder-based inquiry and foresight approach.

Diana authored numerous scientific articles and books in fundamental and applied areas. She co-founded the Initiative for Science, Society and Policy Dialogue, is a scientific board member of the Global Climate Forum, Integrated Risk Governance Project, IPBES and SEI Initiative on Governing Bioeconomy. She co-chaired the pan-European Environmental Outlook of the UNEP and advised the Sustainable Biomass Partnership. She leads and participates in advisory, research and development projects with national and regional governments, companies and World Bank, OECD and UN agencies.



Dr. C N Tripathi

C.N. Tripathi has his PhD from the Department of Geophysics (Climate Change) from Banaras Hindu University, Varanasi. He earned his Master's degree in Geophysics, as well as his Bachelor of Science from the same institution.

Dr. Tripathi is currently the Consulting Director at 'Viyome Infra Energy Pvt. Limited' and a Member of the Governing Body at "Comprehensive Counseling Interface". He has gained extensive research, academic, administrative, and managerial experience in the field of climate change and related issues, including application of regional climate simulation for assessment of impact of climate change on agriculture and water resources of India, as well as technologies for climate change mitigation and adaptation in rural and urban sector. In addition to teaching and training to B.Tech/M.Tech/Doctoral students, he has extensive experience in academic administration. Examples of such experiences include his positions as Head of Department of Environmental Engineering, the Coordinator of the Skill Development Program, a Member of the Proctorial Board, a Member of the flying squad at HCST Mathura, and a Member of the Board of Studies of Civil and Environmental Engineering, AKTU Lucknow.

He is a pioneer in the development of course curriculum of the Bachelor of Technology in Environmental Engineering of AKTU Lucknow. Besides his significant contribution to research and development in the area of application of regional climate simulation and ecosystem models for climate change impact assessment, along with mitigation and adaptation in rural and urban sector, he has also made impactful contributions to organizing society connect programs for farmers and environmental awareness programs. These contributions have also been made to numerous conferences and training programmes in the areas of climate change and environmental management. He is also the reviewer for the prestigious journals "Water Resources Management" of Springer Publications and "Cogent Engineering" of Taylor and Francis publishing house.



Dr. Rohan Dutta

Rohan Dutta holds a doctorate in Cryogenic Engineering from IIT Kharagpur. He earned his Bachelor of Technology degree in Instrumentation Engineering from Haldia Institute of Technology, West Bengal.

Rohan is currently working at the Institute for Plasma Research (IPR) in Gandhinagar on the development of cryocoolers for cryopumps for fusion devices. This research is devoted to developing small to medium scale power generation, energy storage and refrigeration systems for minimizing and mitigating the reliance on fossil fuels as sources of power, as well as on energy for heating/cooling. He aims to continue working towards identifying fitting solutions for adapting to the adverse effects of climate change.

He is writing a book entitled "Cryogenic Process Design and Simulation" while working as a postdoctoral fellow at IPR. He has 33 scientific papers, 13 of which have been published in international journals, and 9 of which have been presented at international conferences. He also has one patent application in India's Kolkata division.

Rohan's doctoral study dealt with design, modifications, and optimization of cycle configurations and controls for large-scale helium refrigerators for fusion devices using process simulation in Aspen Hysys. During his postdoctoral work at the Department of Energy and Process Engineering, NTNU, Trondheim, Norway, he worked on customization of process simulators for dynamic simulation of post-combustion CO₂ capture processes for fossil fuel-based power plants based on absorption using primary amine (MEA). With over 11 years of experience, his key expertise lies in energy engineering, process modeling and simulation, thermodynamics, refrigeration, heat transfer, thermal energy storage, post-combustion CO₂ capture, large-scale cryogenic processes, experimental design and cryogenics.

As a teacher, Rohan strives to foster the ideals of scientific method, investigation, and scholarly inquiry so that his students can apply critical thinking skills to their activities outside of university. Furthermore, he wishes to encourage students to embrace initiative, self-confidence, and originality in all of their pursuits.



Dr. Arpita Bose

Arpita has a PhD in Microbiology from the University of Illinois at Urbana-Champaign, Master of Science in Biotechnology from the All India Institute of Medical Sciences, New Delhi, India and Bachelor of Science (Honours) in Microbiology from University of Delhi. She has 31 peer-reviewed publications, was nominated for SN10 Scientist to Watch by Science News in April 2020, and won Changing the Face of STEM Mentorship Award from L'Oréal USA and AAAS in 2019. She is Associate Professor and Founder of the Bose Lab at Washington University in St. Louis. The lab studies microbial metabolisms and their influence on biogeo-chemical cycling using an interdisciplinary approach. Prior to this, she was a L'Oréal USA Woman in Science Fellow and a Howard Hughes Medical Institute Fellow of the Life Sciences Research Foundation. She was also working as a research associate of the Howard Hughes Medical Institute.



Kartik Desai

Kartik Desai is considered a pioneer of social finance in India, with leadership roles at four pioneering impact investing institutions, advising well-reputed funders, donors, corporates, policymakers and academics and demonstrating a track record of successful impact investments and exits in the last 15 years. He has almost two decades of experience in investment banking, private equity, venture capital, social entrepreneurship, development finance and economic policy. He is also a thought leader, active writer, Professor of Social Finance at Ashoka University and Adjunct Faculty at Ambedkar University,

ISDM and Naropa Fellowship.

He is Founder & CEO of Desai & Associates. Kartik was most recently Partner at KOIS, a global innovative finance firm with asset management and advisory businesses. He founded and led Asha Impact for 7 years, one of India's pre-eminent multi-family offices and think tanks focused on impact investment, and previously was a Vice President at Lok Capital and Aavishkaar, two pioneering funds that helped establish the asset class in India. Kartik started his career in the United States as consultant with organisations like BTS and the Rockefeller Foundation, worked briefly in Africa with the UNDP and moved to India in 2005 to join Merrill Lynch in its investment banking and then private equity divisions, before moving full-time into social finance in 2008.

Kartik has served on the boards of several high growth impact enterprises over his career, as a three-time elected Board Member of the Impact Investors Council, as founder and mentor to NGOs in the urban inclusion, digital media and mental health space and an active angel investor in social enterprises working in remote or underserved parts of India. He has been selected for Government of India initiatives such as the PM's Champions of Change and Parliamentarians and Innovators for India and is an active speaker and contributor to professional seminars, education institutions and government consultations on development finance.

He graduated in 2002 with a BSc Economics (Finance and Management) from the Wharton School, University of Pennsylvania and in 2004 with Masters in International Affairs (International Finance & Business) from SIPA, Columbia University.



Dr. Aditya Parekh

Dr Aditya Parekh completed his Ph.D. from IIT Kharagpur in the domain of Cancer Biology and postgraduation in Biochemistry from the University of Calcutta. As a Fulbright fellow, he did a part of his Ph.D. research at Johns Hopkins University, USA. Thereafter he spent three years at National Center for Biological Sciences (TIFR) as a Postdoctoral Research Associate

studying muscle biology.

His ten years of research experience has led to many research publications in international peer-reviewed journals, different fellowship awards (including Fulbright), popular science writing award (DST AWSAR) and travel grants from government agencies. Besides his core academics, he has been an organiser and volunteer at National Postdoctoral Symposium and has taken part in a few volunteering (with RRA) and social activities (in the field of natural farming and food security).

Dr Parekh is passionate about exploring sustainable farming, food security, rural development and urban greening. As an Assistant Professor at Anant University, he would be teaching and working on sustainable farming and built environment (strategies and solutions, with Anant fellows and UG/PG students), built environment and health (with UG at school of Design) and designing course on health and wellbeing.



Dr. Purnima Mehrotra

Purnima Mehrotra is the Professor of Behaviour Science at Anant National University. She holds a doctorate in development communication from the University of Kentucky. She is a research expert with a wide range of knowledge, experience, and skill sets. She has extensive expertise in various industries, including education, research, advertising, and non-profit, in India, the United States, the United Kingdom, and Southeast Asia. Purnima previously worked at Ashoka University's Centre for Social and Behavioral Change as an Associate Director (Research and Capacity Building).

Deadline : 15th September 2022

Annual fee for Tuition

Indians

₹ 2,90,000/-

Foreign Nationals

₹ 8,65,000/-

Annual fee for boarding & food at the university accommodation — ₹ 2,00,000/-

Scholarships

Up to 100%* scholarships are offered to deserving candidates on the basis of merit as well as need. Once selected, the candidate can approach the Anant School for Climate Action for the scholarship form and submit the duly filled form along with required documents to support their application.

Scholarships are available for limited seats only. Candidates are advised to apply for the program and scholarship well in advance of the admission deadline.

*% of scholarship will be calculated post the submission of form and documents

Contact

If you have any queries, please send an email to climatetech@anu.edu.in.

Contact number : 02717718365,
6352160465

Programmes offered at Anant National University

Bachelor of Design

- Space Design
- Product Design
- Sustainable Fashion
- and Textile Design
- Communication Design
- Interaction Design
- Transdisciplinary Design
- Moving Image

Bachelor of Architecture

Bachelor of Visual Arts

Bachelor of Technology in Climate Change

Master of Design

- Integrated Product Design
- Urban Design and Development

Master of Architecture (Theory and Practice)

Master of Arts (Journalism in Built Environment)

Doctoral Programme

- PhD in Built Environment, Design
- Excellence and Creative Practice

Fellowships

- Anant Fellowship in Built Environment
- Anant Fellowship for Climate Action

Executive Education Programmes

- Designing Affordable Living
- Entrepreneurs in Residence

Centres

- Centre for Visual Arts
- Centre for Urbanism and
- Cultural Economics
- Centre for Behavioural Science
- and Design
- Writing and Communication Studio
- Anant Centre for Sustainability
- International Centre for Inclusive
- Cultural Leadership
- Aarambh Incubation Centre

To know more: <https://anu.edu.in/programme/b-tech-in-climate-change/>