

Interdisciplinary Programme in Climate Studies

Interdisciplinary Dual Degree
Programme (IDDDP)

IIT Bombay

Committee Members

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The recently published Assessment Report 6 (AR6) by the United Nations (UN) Intergovernmental Panel of Climate Studies (IPCC) has called for climate urgency and signaled “*Red Code for Humanity*”. Scientific and technological developments may not be sustainable in these fast-changing environmental scenarios without considering climate inputs and climate considerations. Since the past two decades, ‘Climate’ studies have been gaining emergent worldwide recognition. Many universities in India and abroad are reorganizing their academic curricula at various levels to accommodate the need for education in this discipline. Consistent with the worldwide curriculum in climate studies, the Interdisciplinary Programme in Climate Studies (IDPCS) [under the project, DST-Centre of Excellence in Climate Studies (DST-CoECS)] was thus established at IIT Bombay in 2012 as one of the first doctoral programmes in climate studies in India.

As part of the National Action Plan on Climate Change (NAPCC), the National Mission on Strategic Knowledge for Climate Change (NMSKCC) is one of the eight national missions on climate change coordinated by the Department of Science and Technology (DST), through its Climate Change Programme, Strategic Programmes, Large Initiatives and Coordinated Action Enabler (SPLICE) Division (renamed as "Climate Change Programme Division" w.e.f. 31 March 2021). The broad objective of NMSKCC is to build a vibrant and dynamic knowledge system that would inform and support national action on climate change and sustainable development. IDPCS, IIT Bombay was initiated and supported by DST under the NMSKCC to undertake interdisciplinary, problem-driven research for end-to-end solutions covering the causes and consequences of and responses to climate change. The objectives are to build long-term scientific capacity for studying of regional climate change and climate futures; enabling the creation of a pool of multidisciplinary researchers to serve the growing need for climate change scientists and professionals to serve R&D and policy needs in private, public and governmental institutions. The IDP has successfully provided critical assessments to support policy and governmental decision-making on air and water resources and climate mitigation and adaptation measures. The IDPCS has around 32 faculty members from 11 departments of IIT Bombay. They apply their expertise to interdisciplinary problems related to climate that cross traditional academic boundaries. Their contributions include traditional core climate and environmental sciences, interdisciplinary technology development, climate-economics and social sciences.

A paradigm shift has been observed in every thematic area of climate studies in recent times. The global climate change issues cross core climate science boundaries and focus on climate-resilient technology development, ensuring optimal dynamic adaptation and mitigation strategies. In addition, climate change impact assessment in a more holistic context as related to sustainability, agriculture and food security, cities and urbanization, public health and environment, natural resources (particularly water, energy, forest) management, water-energy-food-waste nexus, and climate modeling are some of the research areas that the IDPCS researchers would consider exploring and excelling in forthcoming years. Climate entrepreneurship is gaining momentum around the globe as a key role-player in developing sustainable climate technologies and undertaking successful innovation.

An Interdisciplinary Dual Degree Programme (IDDDP) in *Climate Science and Policy* at undergraduate level would allow for this need in climate education to be fulfilled and will correspondingly improve placement opportunities for our graduates. The success of IITB’s IDDDP model has already been demonstrated in various departments. The undergraduates will benefit from excellent job opportunities in national and international laboratories, regulatory agencies and consultancy firms. Other direct and indirect benefits emerging out of this programme comprise a formal structure for interdisciplinary

collaborative work in the form of common courses and project work, including sharing laboratory facilities across the Institute and creating a strong national entrepreneurial environment.

Programme Profile

The Minimum eligibility criteria, Application procedure, Rules & Regulations will remain the same as provided in the UG Rule Book, IIT Bombay, Dec. 2020, Section 13 (A to C, Pgs 33-34).

[<https://www.iitb.ac.in/newacadhome/ugrulebook.pdf>]. We propose to have a maximum intake of 5 students in an academic year.

Semester - Seven

Course Code	Course title	L	T	P	C
CM 803/603	Core Course	3	0	0	6
CM/XX	PG Elective*	3	0	0	6
CM/XX	PG Elective†	3	0	0	6
					18

Semester - Eight

Course Code	Course title	L	T	P	C
CM/XX	PG Elective* -OR- PG Elective†	3	0	0	6
CMS 802	Seminar	0	0	0	4
					10

Semester - Nine

Course Code	Course title	L	T	P	C
CM	DDP Stage 1	0	0	0	37
					37

Semester - Ten

Course Code	Course title	L	T	P	C
CM	DDP Stage 2	0	0	0	37
					37

Total Credits (for Dual Degree in “xxxx” Specialization WITHOUT HONORS)

Courses: 24 + 4 (Seminar)

Project: 74

L – Lectures per Week, T – Tutorials per week, P – Practical per week, C – Credits

CORE COURSES

(All are existing courses)

CM 803/603: Intro. to Climate Change (both Autumn and Spring) [3 0 0 6]

CMS 802: Seminar (Autumn/ Spring) [0 0 0 4]

ELECTIVES

(All are existing courses)

Autumn Semester

CE 630: Geographic Information System (GIS)*
CL 665: Sustainable Engineering Principles*
CL 710: Aerosol Technology*
CM 607: Energy & Climate†
CM 609: Environmental Planning and Development†
CM 605: Public Policy & Governance†
CM 801/601: Introduction to Risk Analysis*
CM 701: Geophysical Fluid Dynamics*
CE 605: Applied Statistics*
CE 701: Remote Sensing Technology*
CE 712: Digital Image Processing of Remotely Sensed Data*
CE 764: Hydro-informatics*
EN 606: Energy Resources, Economics and Environment*
US 604: Management Techniques for Urban Systems*
US 607: Sustainability Assessment of Urban Systems*
CM 6XX Climate Modeling*
CM 6XX Monsoon Dynamics *

Spring Semester

CE 607: Numerical techniques in hydraulic engineering*
CE 676: Water Resources Systems*
CE 707: Coastal, Port and Harbour Engineering*
CE 710: RS & GIS for Hydrology & Water Management*
CM 604: Remote sensing for Environmental and Climate Change Studies*
CM 608: Sustainable Engineering Principles*
CE 608: Eco-hydro-climatology*
CM 610: Policy Responses to Climate Change†
CM 606: Energy Resources, Economics and Environment†
CM 702: Law, Governance, Rights and Development†
CE 658: Hydrogeomorphology*
CM 802: Atmosphere and Climate Change*
EN 653/PS 611: Energy Policy Analysis/Energy Policy Analysis†
HS 606: Environmental Planning and Development†
MNG 620: Business and Sustainable development†
US 606: Urban Environmental Infrastructure*
CE766 Watershed Management*
CM6XX: Ocean-Atmosphere Dynamics*

* SCIENCE-TRACK COURSE; † POLICY-TRACK COURSE

If a student wants to take a course that is not listed but can be used as a replacement for any of the listed courses, she/ he needs IDPC approval for the same.