TERI School of Advanced Studies

New Delhi

Prospectus and Information Brochure - 2023

Four-year undergraduate and Five-year integrated postgraduate programmes

10 Institutional Area, Vasant Kunj, New Delhi

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1.   General Information

The TERI SAS is the outcome of research, consultancy, and outreach activities of TERI – a not-for-profit organization in the non-governmental sector – internationally recognized for its contributions in the fields of energy, environment, biosciences, and sustainable development.

The Deemed to be University was established and constituted on 19 August 1998 and was granted 'Deemed-to-be University' status by the UGC (University Grants Commission), and notified vide Ministry of Human Resource Development, Department of Education, Government of India [notification no. F-9/19/95-U-3, dated 5 October 1999]. The Deemed to be University is accredited by NAAC. All technical programmes offered by the Deemed to be University are recognised by AICTE.

1.1   Location

Located at Vasant Kunj in South Delhi, the new TERI SAS Campus provides a setting that enhances learning and showcases the concept of green building design. Well-equipped classrooms and laboratories aid teaching and research. The campus is close to the Jawaharlal Nehru University and the Indian Institute of Technology, Delhi. It is 8 kilometres from the Indira Gandhi International Airport, 12 kilometres from the Domestic Airport, and 18 kilometres from the New Delhi Railway Station.

Location Map

TERI School of Advanced Studies Location Map
Plot No 10, Institutional Area,Vasant Kunj
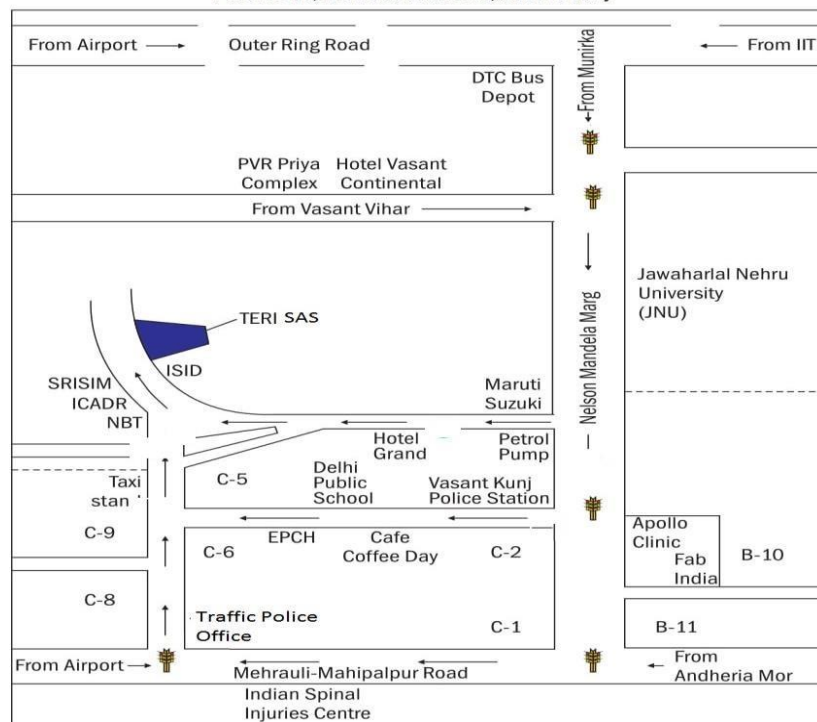
1.2   Departments and Centres

The Deemed to be University has evolved an organizational structure drawing on the research activities of TERI. Besides the teaching staff of the Deemed to be University, the research staff of TERI with doctoral degrees and a rich experience of working on projects related to bioresources, biotechnology, energy, environment, regulatory studies, and policy research are adjunct faculty at the Deemed to be University. The Department functional in the Deemed to be University are:

(i)   Department of Natural and Applied Sciences

(ii)   Department of Sustainability Engineering

(iii)   Department of Policy and Management Studies

(iv)   Department of Regional Water Studies

(v)   Department of Biotechnology

(vi)   Centre for Postgraduate Legal Studies

1.3   Contact Details of Authorities

Name	Email	Contact no.
Col. B Venkat (Registrar)	registrar@terisas.ac.in	011-71800222 (Ext. no – 4752)
Mr. Dhanraj Singh (Deputy Finance and Project Management Officer)	dhanraj.singh@terisas.ac.in	011-71800222 (Ext. no – 4757)
Prof. Shashi Bhushan Tripathi (Controller of Examinations)	shashi.tripathi@terisas.ac.in	011-71800222 (Ext. no – 4754)
Mr. Ratan Jha (Assistant Librarian)	ratan.jha@terisas.ac.in	011-71800222 (Ext. no – 4850)

1.4 Department wise faculty details with qualification

Name of the faculty	Designation	Department	Qualification
Chander Kumar Singh	Associate Professor	Department of Natural and Applied Sciences	Ph.D.
Vinay S.Prasad Sinha	Professor	Department of Natural and Applied Sciences	Ph.D.
Chandrashekhar Azad Vishwakarma	Assistant Professor	Department of Natural and Applied Sciences	Ph.D.
Anand Madhukar	Assistant Professor	Department of Natural and Applied Sciences	Ph.D.
Ayushi Vijhani	Assistant Professor	Department of Natural and Applied Sciences	Ph.D.
Prateek Sharma	Professor	Department of Natural and Applied Sciences	Ph.D.
Anandita Singh	Professor	Department of Biotechnology	Ph.D.
S. Ramakrishnan	Professor	Department of Biotechnology	Ph.D.
Chaithanya Madhurantakam	Associate Professor	Department of Biotechnology	Ph.D.
Shashi Bhushan Tripathi	Professor	Department of Biotechnology	Ph.D.
Gopal Sarangi	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Sukanya Das	Associate Professor	Department of Policy and Management Studies	Ph.D.
Shantanu De Roy	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Swarup Dutta	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Chandan Kumar	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Vidhi Madaan	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Shruti Sharma Rana	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Sanyyam Khurana	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Priyanka Arora	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Moumita Acharyya	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Ann Francis	Assistant Professor	Department of Policy and Management Studies	M. Tech
Resham Nagpal	Assistant Professor	Department of Policy and Management Studies	Ph.D.
Ranjana Ray Chaudhuri	Assistant Professor	Department of Regional Water Studies	Ph.D.
Arun Kansal	Professor	Department of Regional Water Studies	Ph.D.
Shaleen Singhal	Professor	Department of Sustainable Engineering	Ph.D.
Bhawna Bali	Assistant Professor	Department of Sustainable Engineering	Ph.D.
Naqui Anwer	Professor	Department of Sustainable Engineering	Ph.D.

1.5 Professor of Practice

Dr B K Bhadra
Department of Natural and Applied Sciences

Dr Neeraj Sharma
Department of Policy and Management Studies

Dr A.K. Mitra
Department of Natural and Applied Sciences

Col Sanjay Kumar Srivastava (Retd)
Department of Natural and Applied Sciences

2. Governance Structure

2.1 Objectives

- To provide for higher education leading to excellence and innovations in such branches of knowledge as may be deemed fit, primarily at post-graduate and research degree levels, fully conforming to the concept of Deemed to be University as defined herein.

- To engage in areas of specialization with proven ability to make distinctive contributions to the objectives of the higher education system in diverse disciplines.

- To provide for high quality teaching and research recognized nationally and globally.

- To provide for high quality teaching and research and for the advancement of knowledge and its dissemination through various research programmes undertaken in -house by full time faculty/research scholars (PhDs and Post-Doctoral) in diverse disciplines.

- To provide for institution and training in energy studies, biosciences, environmental sciences, public policy and other such branches of learning as it may deem fit.

- To do all such other acts and things as may be necessary or desirable to further the objects of the Deemed to be University. These may include, inter alia,

  i. Establishment of and participation in collaborative activities with other educational institutions in and outside the country;
  ii. To sponsor and organize teaching and training programmes, conferences and seminars on subjects of theoretical or practical relevance to the courses of study;
  iii. To establish, acquire and mention facilities such as offices, residential accommodation for staff, hostel for students, etc.

2.2 Administration

The Deemed to be University has a Board of Management, which is responsible for its overall administration and control. The academic policy of the Deemed to be University is decided by the Academic Council. The Vice-Chancellor of the Deemed to be University is the Chairperson of the Board of Management and the Academic Council. Financial advice to the Deemed to be

University is rendered by the Finance Committee. The following are constituted in the TERI SAS: -

(a) Authorities

    (i)   Board of Management
    (ii)   Academic Council
    (iii)   Planning and Monitoring Board
    (iv)   Finance Committee
    (v)   Board of Studies at Departments

(b) Officers

    (i)   Chancellor
    (ii)   Vice-Chancellor
    (iii)   Dean (Academic)
    (iv)   Dean (Research & Partnerships)
    (v)   Dean (Student's Welfare)
    (vi)   Proctor
    (vii)   Registrar
    (viii) Controller of Examinations
    (ix)   Heads of Departments/Centre
    (x)   Deputy Finance & Project Management Officer
    (xi)   Assistant Controller of Examination

2.3   Board of Management

Chairman
Prof. Prateek Sharma
Professor & Vice Chancellor (Acting), TERI SAS

Deans
Prof. Ramakrishnan Sitaraman
Professor & Dean (Academic), TERI SAS

Prof. Shaleen Singhal
Professor & Dean (Research & Partnerships), TERI SAS

Three eminent Academicians nominated by Chancellor

Prof Basabi Bhaumik
Former Professor, IIT Delhi

Dr Sachin Chaturvedi
Director General, Research and Information System for Developing Countries (RIS)

Dr Swati Basu

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Former Director, National Centre for Medium Range Weather Forecasting and
Former Scientific Secretary, PSA's Office, Government of India

Nominee of Sponsoring Society

Dr Kiran Kumar Sharma
Senior Director, Sustainable Agriculture Program, TERI

Dr Nitya Nanda
Director, Council for Social Development

Dr O P Agarwal
Former IAS and former CEO of WRI

Two teachers (from Prof and Associate Prof)

Prof. Anandita Singh
Professor, TERI SAS

Dr Sukanya Das
Associate Professor, TERI SAS

Secretary
Col. B Venkat (Retd.)
Registrar, TERI SAS

2.4   Academic Council

Chairperson
Prof. Prateek Sharma
Professor & Vice Chancellor (Acting), TERI SAS

Deans

Prof. Shaleen Singhal
Professor & Dean (Research & Partnerships)

Prof. Anandita Singh
Professor & Dean (Student's Welfare)

Heads of the Departments

Prof. Naqui Anwer
Dr Chander Kumar Singh
Dr Ranjana Ray Chaudhuri
Dr Sukanya Das
Dr Chaithanya Madhurantakam

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Professors

Prof. Arun Kansal

Two Associate Professors from Departments

Dr Chander Kumar Singh
Dr Smriti Das

Two Assistant Professors from the department by rotation of seniority

Dr Shruti Sharma Rana
Dr Gopal Sarangi

Nominees by the Vice Chancellor

Prof. Shreekant Gupta
Professor, Delhi School of Economics, University of Delhi

Prof. P.S.N. Rao
Director, School of Planning and Architecture

Prof. Sagnik Dey
Institute Chair Professor, Centre for Atmospheric Sciences, Indian Institute of
Technology Delhi

Prof. T C Kandpal
Professor, Centre for Energy Studies, Indian Institute of Technology Delhi

Prof. Vivek Suneja
Faculty of Management Studies, University of Delhi

Prof. Suresh Jain
Professor, IIT Tirupati

Co-opted Members

Mr. Manoj Chugh
President – Group Public Affairs & Member of the Group Executive Board Mahindra
& Mahindra Ltd

Mr. Rahul Mittal
Director, International Tractors Ltd.

Dr Sabhyata Bhatia
Staff Scientist VII, National Institute of Plant Genome Research, New Delhi

Mr. Shubhashis Dey
Director – Climate Policy Program, (Low Carbon Development, Air Quality &
Climate Finance), Shakti Foundation

Dr Niraj Sharma
Chief Scientist, TPE Division, CSIR-Central Road Research Institute

Dr Bidyut Kumar Bhadra
Dy. General Manager, Regional Remote Sensing Centre-North, National Remote
Sensing Centre, Indian Space Research Organisation

Dr Madhusudan Sau
Executive Director, R&D Centre, Indian Oil Corporation Limited

Mr. Sudhir Vadehra
Ex-Advisor, Ministry of Power; and Executive Director, REC (Retd)

Controller of Exams

Prof. Shashi Bhushan Tripathi

Secretary
Col. B Venkat (Retd.)
Registrar, TERI SAS

2.5 Planning and Monitoring Board

Chairperson
Prof. Prateek Sharma
Professor & Vice Chancellor (Acting), TERI SAS

Deans
Prof. Ramakrishnan Sitaraman
Professor & Dean (Academic), TERI SAS

Prof. Shaleen Singhal
Professor & Dean (Research & Partnerships)

Heads of the Departments

Dr Chander Kumar Singh
Professor, Department of Natural and Applied Sciences

Dr Ranjana Ray Chaudhuri

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Associate Professor, Department of Regional Water Studies

Dr Sukanya Das
Associate Professor, Department of Policy and Management Studies

Prof. Naqui Anwer
Professor, Department of Sustainable Engineering

Dr Chaithanya Madhurantakam
Associate Professor, Department of Biotechnology

Outside Eminent Experts

Dr Lakshmi Raghupathi
Former Director, Ministry of Environment & Forest, Government of India

Dr M N Murty
Retired Professor, Institute of Economic Growth, Delhi University

Nominee of the UGC

Prof Vir Singh
Department of Physics, IIT, Roorkee

Secretary
Col B Venkat (Retd.), Registrar

2.6   Finance Committee

Chairperson

Prof. Prateek Sharma
Vice Chancellor (Acting), TERI SAS

Nominees of the Trust/Society

Ms. Meenakshi ChaddhaCFO, TERI

Two nominees of Board of Management

Prof. Ramakrishnan Sitaraman
Prof. Shaleen Singhal

Secretary
Mr. Dhanraj Singh,Deputy
Finance and Project Management Officer, TERI SAS

3. Calendar

3.1 List of Holidays

Sl. No.	List of Holidays	Dates	Day
1	Republic Day	26 January	Thursday
2	Maha Shivratri	18 February	Saturday
3	Holi	8 March	Wednesday
4	Ram Navami	30 March	Thursday
5	Good Friday	07 April	Friday
6	Id-ul-Fitr	22 April	Saturday
7	Id-ul-Zuha (Bakrid)	29 June	Thursday
8	Muharram	29 July	Saturday
9	Independence Day	15 August	Tuesday
10	Raksha Bandhan	30 August	Wednesday
11	Janmashtami	7 September	Thursday
12	Mahatma Gandhi's Birthday	2 October	Monday
13	Dussehra	24 October	Tuesday
14	Diwali (Deepavali)	12 November	Sunday
15	Govardhan Puja	13 November	Monday
16	Bhaiya Duj	15 November	Wednesday
17	Guru Nanak's Birthday	27 November	Monday
18	Christmas Day	25 December	Monday

4. Academic system

All definitions, duration of programmes, curriculum framework, learning assessments etc have been adopted from the Curriculum and Credit Framework for Undergraduate Programmes, UGC, December 2022 (https://www.ugc.gov.in/pdfnews/7193743_FYUGP.pdf) and National Higher Education Qualification Framework, UGC, May 2023 (https://www.ugc.gov.in/pdfnews/2990035_Final-NHEQF.pdf). Few definitions have been reproduced to provide clarity to understand the programme structure of the various programmes.

4.1 Type of courses

4.1.1 Major

Major discipline is the discipline or subject of main focus and the degree will be awarded in that discipline. Students should secure the prescribed number of credits (about 50% of total

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credits) through core courses in the major discipline. Disciplinary/Interdisciplinary major provides the opportunity to the student to pursue in-depth study of a particular subject or discipline. All major courses may be of 4 credits. A student has to secure a minimum of 50% of credits from the major discipline (for a disciplinary/interdisciplinary degree) in order to obtain a 3-year/4-year **UG degree with single major**. A student has to secure a minimum of 40% credits from the second major discipline in order to obtain a 3-year/4-year UG degree with double major.

	3-year Single Major		4-year Single Major	
Types	Credit	% Credit	Credit	% Credit
Major	60	50.0	80	40.0
Minor	24	20.0	32	40.0
Multidisciplinary	9	7.5	9	7.5
Ability Enhancement Courses (AEC)	8	6.7	8	6.7
Skill Enhancement Courses (SEC)	9	7.5	9	7.5
Value Added Courses (VAC)	6	5.0	6	5
Summer Internship (SI)	4	3.3	4	3.3
Total	120	100.0	160	100.0

4.1.2 Minor

Minor discipline helps a student to gain a broader understanding beyond the major discipline. The minor stream courses include vocational courses which will help the students to equip with job-oriented skills. Students will have the option to choose courses from disciplinary/interdisciplinary minors and skill-based courses relating to a chosen vocational education programme. All minor courses may be of 4 credits.

4.1.3 Multidisciplinary
All courses under the multi-disciplinary may be of 3-credits.

   I. Natural and Physical Sciences: Students can choose basic courses from disciplines such as Natural Science, for example, Biology, Botany, Zoology, Biotechnology, Biochemistry, Chemistry, Physics, Biophysics, Astronomy and Astrophysics, Earth and Environmental Sciences, etc.

  II. Mathematics, Statistics, and Computer Applications: Courses under this category will facilitate the students to use and apply tools and techniques in their major and minor disciplines. The course may include training in programming software like Python among others and applications software like STATA, SPSS, Tally, etc. Basic courses under this category will be helpful for science and social science in data analysis and the application of quantitative tools.

 III. Library, Information, and Media Sciences: Courses from this category will help the students to understand the recent developments in information and media science (journalism, mass media, and communication).

 IV. Commerce and Management: Courses include business management, accountancy, finance, financial institutions, fintech, etc.,

V. Humanities and Social Sciences: The courses relating to Social Sciences, for example, Anthropology, Communication and Media, Economics, History, Linguistics, Political Science, Psychology, Social Work, Sociology, etc. will enable students to understand the individuals and their social behaviour, society, and nation. Students be introduced to survey methodology and available large-scale databases for India. The courses under humanities include, for example, Archaeology, History, Comparative Literature, Arts & Creative expressions, Creative Writing and Literature, language(s), Philosophy, etc., and interdisciplinary courses relating to humanities. The list of Courses that can include interdisciplinary subjects such as Cognitive Science, Environmental Science, Gender Studies, Global Environment & Health, International Relations, Political Economy and Development, Sustainable Development, Women's and Gender Studies, etc.

4.1.4 Ability Enhancement Courses (AEC)

I. Students are required to achieve competency in a Modern Indian Language (MIL) and in the English language with special emphasis on language and communication skills.
II. The courses aim at enabling the students to acquire and demonstrate the core linguistic skills, including critical reading and expository and academic writing skills, that help students articulate their arguments and present their thinking clearly and coherently and recognize the importance of language as a mediator of knowledge and identity.
III. They would also enable students to acquaint themselves with the cultural and intellectual heritage of the chosen MIL and English language, as well as to provide a reflective understanding of the structure and complexity of the language/literature related to both the MIL and English language.
IV. The courses will also emphasize the development and enhancement of skills such as communication, and the ability to participate/conduct discussion and debate.

All courses under Ability Enhancement (language) categories may be of 3-credits.

4.1.5 Skill Enhancement Courses (SEC)

These courses are aimed at imparting practical skills, hands-on training, soft skills, etc., to enhance the employability of students.

All courses under the Skill Enhancement categories may be of 3-credits.

4.1.6 Value-Added Courses (VAC)

Courses under Value Added, Summer Internship/ Apprenticeship/ Community outreach activities, etc., for all majors, may be of 2-credits.

I. Understanding India: The course aims at enabling the students to acquire and demonstrate the knowledge and understanding of contemporary India with its historical perspective, the basic framework of the goals and policies of national development, and the constitutional obligations with special emphasis on constitutional values and fundamental rights and duties.

II. Environmental science/education: The course seeks to equip students with the ability to apply the acquired knowledge, skills, attitudes, and values required to take appropriate actions for mitigating the effects of environmental degradation, climate

change, and pollution, effective waste management, conservation of biological diversity, management of biological resources, forest and wildlife conservation, and sustainable development and living.

III.   Digital and technological solutions: Courses in cutting-edge areas that are fast gaining prominences, such as Artificial Intelligence (AI), 3-D machining, big data analysis, machine learning, drone technologies, and Deep learning with important applications to health, environment, and sustainable living that will be woven into undergraduate education for enhancing the employability of the youth.

IV.   Health & Wellness, Yoga education, sports, and fitness: Course components relating to health and wellness seek to promote an optimal state of physical, emotional, intellectual, social, spiritual, and environmental well-being of a person. Sports and fitness activities will be organized outside the regular institutional working hours.

4.2   Type of programmes

4.2.1   UG Degree Programmes with Single Major

A student has to secure a minimum of 50% credits from the major discipline for the 3-year/4-year UG degree to be awarded a single major.

4.2.2   UG Degree Programmes with Double Major

A student has to secure a minimum of 40% credits from the second major discipline for the 3-year/4-year UG degree to be awarded a double major.

4.2.3   Interdisciplinary UG Programmes

The credits for core courses shall be distributed among the constituent disciplines/subjects so as to get core competence in the interdisciplinary programme.

4.2.4   Multidisciplinary UG Programmes

The credits to core courses will be distributed among the broad disciplines such as Life sciences, Physical Sciences, Mathematical and Computer Sciences, Data Analysis, Social Sciences, Humanities, etc.

5.   Academic programmes

The TERI SAS offers four-year undergraduate programmes (FYUP) and five-year integrated postgraduate programmes (FYIPP). All the programmes have been designed in accordance with the National Education Policy (NEP) 2020 and the recent guidelines issued by the University Grants Commission 1 with in-built choices of multiple entry and multiple exit options mapped with employability opportunities.

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[1] Curriculum and Credit Framework for Undergraduate Programmes, UGC, December 2022 (https://www.ugc.gov.in/pdfnews/7193743_FYUGP.pdf) and National Higher Education Qualification Framework, UGC, May 2023 (https://www.ugc.gov.in/pdfnews/2990035_Final-NHEQF.pdf)

5.1 Environmental Studies

In its pursuit towards growth and development humans have become an external driver of the ecosystem resulting in impacting the environmental parameters. This poses serious threat and challenges affecting human welfare – climate change, air pollution, water scarcity, land degradation, biodiversity loss, deforestation and depletion of fish stock.

The FYUP and FYIPP in Environmental Studies lays foundation for the students from diverse backgrounds to understand the interdisciplinarity of environmental and resources management and learn various tools and techniques. The programme is designed to build a cadre of professionals who are equipped with the knowledge and skillsets to deal with scientific and policy aspects related to environment and resource management. The programme has been innovatively designed that will provide students to have in-depth study of interdisciplinary major in Environmental Studies with an option to choose from interdisciplinary minors and skill-based courses relating to a chosen thematic area – climate science, natural resources, data science, geoinformatics, economics and management studies.

Following two programmes are offered with Environmental Studies as the interdisciplinary major.

5.1.1 FYUP: B.Sc. (Honours)/B.Sc. (Honours with Research)

5.1.2 FYIPP: B.Sc. (Honours)/B.Sc. (Honours with Research) & M.Sc.)

5.1.3 Eligibility

To enter the FYUP and FYIPP in Environmental Studies, students must meet the following prerequisites:

A Senior Secondary School Examination (10+2) certificate in any discipline or equivalent, from a recognized Board of Education with at least 50% marks in aggregate. There is no age bar.

5.1.4 Admission process

Admission to any FYUP and FYIPP in Environmental Studies shall be on the basis of merit of marks secured in 10+2 or equivalent examination in aggregate of best of three subjects and one language.

5.1.5   Programme structure

Four-Year Under-Graduate Programme (FYUP) in Environmental Studies [B.Sc. (Honours)/B.Sc. (Honours with Research)]

Year 1: Semester 1

S.No.	Course	Type	Credit	Credits earned
1.	Ecology and Ecosystems	Major	4	
2.	Earth and Earth Surface Processes	Major	4	10
3.	Environment and Society	Major	2	
4.	Minor 1[2] to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	4
5.	Fundamentals of Data Science	Multidisciplinary	2	2
6.	Communication Skills and Technical Writing	AEC	2	2
7.	Fundamentals of Computers and Programming	SEC	2	2
8.	Principles and Concepts of Sustainability (SD)	VAC	2	2
Total Credits earned			**22**	**22**

Year 1: Semester 2

S.No.	Course	Type	Credit	Credits earned
1.	Environmental Chemistry	Major	3	
2.	Environmental Laboratory	Major	3	9
3.	Environmental Physics	Major (Elective)[3]	3	
4.	Biological Science	Major (Elective)[13]	3	
5.	Minor 2 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	3	3
5.	Problem-Solving and Python Programming	Multidisciplinary	3	3
6.	Modern Indian Language 1 or Business Communication and Information Ethics	AEC	3	3
7.	Introduction to Remote Sensing	SEC	2	2
8.	Ancient Indian Sustainable Practices	VAC	2	
9.	Constitutional Values and Fundamental Duties	VAC	2	4
Total Credits earned			**24**	**24**
Total credits earned at the end of first year = 22 + 24 = 46 (Minimum requirement: 40)				
10.	Vocational course/ Summer internship (8-weeks) to Exit with UG-Certificate	Vocational/ Internship[4]	4	4

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[2] The number against "Minor" represents the semester number in which the Minor is offered.

[3] Choose one elective

[4] Students exiting the programme after securing minimum 40 credits will be awarded UG-Certificate in Environmental Studies provided they secure additional 4 credits in work-based vocational courses offered during summer-term or internship/apprenticeship in addition to 6 credits from skill-based courses earned during 2nd semester.

	Total credits earned for UG Certificate = 22 + 24+ 4 = 50 (Minimum requirement: 44)

EXIT Level 4.5: UG Certificate in Environmental Studies [Credits earned: 50]

Year 2: Semester 3

S.No.	Course	Type	Credit	Credits earned
1.	Atmosphere and Global Climate Change	Major	3	
2.	Biodiversity and Conservation	Major	3	9
3.	Gender and Environment	Major	3	
4.	Minor 3 to be selected from Data Science /Economics /Management Stream	Minor	3	3
5.	Advanced Statistics/ Linear Algebra and Discrete Mathematics/ Bioinformatics	Multidisciplinary (Elective)	4	4
6.	Modern Indian Language 2	AEC	3	3
7.	Introduction to Geographic Information System	SEC	3	5
8.	Cybersecurity for Data Science	SEC	2	
	Total Credits earned		**24**	**24**

Year 2: Semester 4

S.No.	Course	Type	Credit	Credits earned
1.	Principles of Hydrology	Major	4	
2.	Natural Hazards and Disaster Risk Reduction	Major	4	
3.	Environment and Pollution Science	Major	4	16
4.	Natural Resource Management and Sustainability	Major	4	
5.	Minor 4 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	4
	Total Credits earned		**20**	**20**
	Credits earned in 2ⁿᵈ year = 23 + 20 = 43			**43**
	Credits earned at end of the 2ⁿᵈ year = 46 + 44 = 90 (Minimum requirement: 80)			
6.	Vocational course/ Summer internship project (8-weeks) to Exit with UG-Diploma	Vocational/ Internship[5]	4	4
	Total credits earned for UG Diploma = 46 + 44 + 4 = 94 (Minimum requirement: 84)			

EXIT Level 5: UG Diploma in Environmental Studies [Credits earned: 94]

Year 3: Semester 5

S.No.	Course	Type	Credit	Credits earned
1.	Green Technologies	Major	4	
2.	Solid and Hazardous Waste Management	Major	4	12
3.	Environmental Movements	Major	4	

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[5] Students exiting the programme after securing minimum 80 credits will be awarded UG Diploma in Environmental Studies provided they secure additional 4 credits in work-based vocational courses offered during first year or second year summer-term.

S.No.	Course	Type	Credit	Credits earned
4.	1st Minor 5 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	8
5.	2nd Minor 5 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	
Total Credits earned			**20**	**20**

Year 3: Semester 6

S.No.	Course	Type	Credit	Credits earned
1.	Urban Ecosystem	Major 16	4	12
2.	Marine Ecology	Major 17	4	
3.	Forest Ecology	Major 18	4	
4.	1st Minor 6 to be selected from Data Science /Economics /Management Stream	Minor 6 (Elective)	4	8
5.	2nd Minor 6 to be selected from Data Science /Economics /Management Stream	Minor 6 (Elective)	4	
Total Credits earned			**20**	**20**
Credits earned in 3rd year = 20 + 20 = 40			**40**	**40**
Credits earned at end of the 3rd year = 46 + 44 + 40 = 130				
6.	Vocational course/ Summer internship project (8-weeks) to Exit 3-Year UG Degree	Internship[6]	4	4
Total credits earned for 3-year UG Degree = 46 + 44 + 40 + 4 = 134 (Minimum requirement: 120)				

EXIT Level 5.5: 3-year B.Sc. in Environmental Studies [Credits earned: 134]

Year 4: Semester 7

S. No.	Course	Type	Credit	Credits earned
1.	Ecosystem Processes	Major	3	15
2.	Environmental Chemistry II	Major	3	
3.	Environmental Monitoring Lab II	Major	4	
4.	Research Methodology and Thesis Writing	Major	2	
5.	Earth and Environment	Major (Elective)[7]	4	
6.	Energy and Environment	Major (Elective)[19]	3	
7.	1st Minor 7 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	3	6
8.	2nd Minor 7 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	3	
9.	Principles and Concepts of Sustainability (SD) [@]	VAC	2	2
Total Credits earned			**21+2**	**23[@]**

[@]VAC Introduce in case students from other institutions have not opted for such courses in B.Sc.

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[6] Students exiting the programme after securing minimum 120 credits will be awarded 3-Year B.Sc. Degree in Environmental Studies provided they secure additional 4 credits in internship courses offered during first year or second year or third year summer-term.

[7] Choose one elective

Year 4: Semester 8

S.No.	Course	Type	Credit	Credits
1.	Ecological Footprint and EIA	Major	4	8
2.	Environmental Finance and Economics	Major	4	
3.	Minor 8 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	4
4.	Wildlife Assessment, Conservation and Management	Major[8]	4	12
5.	Integrated Watershed Management	Major[20]	4	
6.	Environment Health and Risk Assessment	Major[20]	4	
7.	Research Project/Dissertation	Dissertation[9]	12	12
Credits earned			**24**	**24**
Credits earned in 4th year = 21 + 24 = 45				**45**
Credits earned at end of the 4th year = 46 + 44 + 40 + 45 = 175				
8.	Summer internship project (8-weeks) to Exit 4-Year UG Degree	Internship[10]	4	4
Total credits earned for 4-year UG Degree = 46 + 44 + 40 + 45 + 4 = 179 (Minimum requirement: 160)				

EXIT 6: 4-year B.Sc. in Data Science (Honours/ Honours with Research) [Credits earned: 179]

Five Year Integrated Post-Graduate (FYIP) Programme in Environmental Studies (M.Sc. in Environmental Studies)

Year 5: Semester 9

S.No.	Course	Type	Credit	Credits earned
1.	ESG and Sustainability	Major	4	12
2.	Air Quality Management	Major	4	
3.	Water and Wastewater Treatment Methods	Major	4	
4.	1st Minor 9 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	8
5.	2nd Minor 9 to be selected from Data Science /Economics /Management Stream	Minor (Elective)	4	
Total Credits earned			**20**	**20**

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[8] Students exiting the programme after securing minimum 160 credits will be awarded 4-year UG Degree (Honours) in Environmental Studies after doing at least 3 courses for 12 credits in lieu of a research project/dissertation.

[9] Students who secure 75% marks and above in the first six semesters and wish to undertake research at the UG level can choose a research stream in the fourth year by doing a research project or dissertation under the guidance of a faculty member of the University; the students who secure at least 160 credits, including 12 credits from a research project/dissertation can exit the programme with 4-year UG Degree (Honours with Research) in Environmental Studies.

[10] Students exiting the programme after securing minimum 160 credits will be awarded 4-Year B.Sc. (Honours/Honours with Research) Degree in Environmental Studies provided they secure additional 4 credits internship courses offered during first year or second year or third year or fourth year summer-term.

Year 5: Semester 10

S.No.	Course	Type	Credit	Credits earned
1.	4 Major courses in Data Science and 1 Minor Course from other discipline or Major Project*	4 Major + 1 Minor/ Major project Dissertation	20	20
Total Credits earned			**20**	**20**
Credits earned in 2nd year = 20 + 20 = 40			**40**	**40**
Credits earned at end of the 2nd year in M.Sc. = 20 + 20 = 40				
Total credits earned for Degree (UG + PG) = 175 + 40 = 215 (Minimum requirement 200)				

* To be approved by the Academic Council

EXIT 6.5: 5-year M.Sc.[11] in Environmental Studies [Credits earned: 215]

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[11] The student exits the 5-year integrated programme with degrees – B.Sc. (Honours/Honours with Research) and M.Sc. in Environmental Studies

Five Years Course Distribution of Integrated Master Programme in Environmental Studies

Semester	Discipline Specific Courses -Core / Major	Minor	Inter-disciplinary courses	Ability Enhancement courses (language)	Skill Enhancement courses /Internship /Dissertation	Common Value-Added Courses	Vocational course/ Summer internship	Research Project/ Dissertation	Total Credits
I	10	4	2	2	2	2	-	-	22
II	9	3	3	3	2	4	4*	-	24
Students exiting the programme after **securing 40 credits will be awarded UG Certificate** in the relevant Discipline /Subject **provided they secure 4 credits in work based vocational courses offered during summer term or internship / Apprenticeship** in addition to 6 credits from skill-based courses earned during first and second semester.									**46+4**
III	9	3	4	3	5				24
IV	16	4					4**		20
Students exiting the programme after **securing 80 credits will be awarded UG Diploma** in the relevant Discipline /Subject **provided they secure additional 4 credit in skill based vocational courses** offered during first year or second year summer term.									**90 +4**
V	12	8	-	-	-	-	-	-	20
VI	12	8	-	-	-	-	4**	-	20
3-Year B.Sc. in Environmental Studies: Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline /Subject upon securing 120 credits									**130 +4**
VII	15	6	-	-	-	2	-	-	21
VIII	20	4	-	-	-	-	4**	12#	24
4-Year B.Sc. (Honours/ Honours with Research) **in Environmental Studies:** Students will be awarded UG Degree (Honours/ Honours with Research) in the relevant Discipline /Subject									**175 +4**
IX	12	8	-	-	-	-	-	-	20
X	-	-	-	-	-	-	4	16	20
5-Year M.Sc. in Environmental Studies: Students will be awarded PG Degree in the relevant Discipline /Subject									**215**

*Applicable only when the student wants to exit the programme.
** Student can exit the programme without earning 4 credits in the second year, provided the credit requirement is completed in the first-year under Vocational course/ Summer internship.
# 4-Year B.Sc. (Honours with Research) students will opt in-house 12 credits of Research Project/ Dissertation requirement and it will be considered as core (major).

5.2 Data Science

Data science is an interdisciplinary rapidly emerging branch of learning that facilitates extraction of information for large datasets using scientific methods that are combination of mathematics, statistics, computer science, machine learning, artificial intelligence, deep learning and Domain-specific knowledge. It covers the development and application of quantitative methods that provide essential tools for understanding, predicting, and controlling the impacts of agents, both man-made and natural, which affect the environment. Basic and applied research in this area covers a broad range of topics. Applications are also important, for example in ecology and environmental biology, public health, atmospheric science, geology, engineering, risk management, and regulatory/ governmental policy, amongst others.

The FYUP and FYIPP in Data Science will provide formal training in various quantitative techniques, along with a unique blend of theory and practice interwoven in a qualitative matrix. The programme will facilitate a systematic amalgamation of widespread knowledge under a common platform. This will in turn foster learning through an interdisciplinary approach.

The programme has been innovatively designed that will provide students to have in-depth study of interdisciplinary major in Data Science with an option to choose from interdisciplinary minors and skill-based courses relating to a chosen thematic area – environmental studies, climate science, geoinformatics, economics and management studies.

5.2.1 FYUP: B.Sc. (Honours)/B.Sc. (Honours with Research)

5.2.2 FYIPP: B.Sc. (Honours)/B.Sc. (Honours with Research) & M.Sc.)

Four Year Under-Graduate Programme (FYUP) in Data Science [B.Sc. (Honours)/B.Sc. (Honours with Research)]

Year 1: Semester 1

S.No.	Course	Type	Credit	Credits earned
1.	Fundamentals of Data Science	Major	2	
2.	Mathematics for Data Science	Major	4	10
3.	Statistics for Data Science	Major	4	
4.	Minor 1[12] to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	4	4
5.	Environment and Society	Multidisciplinary	2	2
6.	Communication Skills and Technical Writing	AEC	2	2
7.	Fundamentals of Computers and Programming	SEC	2	2
8.	Principles and Concepts of Sustainability	VAC	2	2
Total credits earned			**22**	**22**

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[12] The number against "Minor" represents the semester number in which the Minor is offered.

Year 1: Semester 2

S.No.	Course	Type	Credit	Credits earned
1.	Problem-Solving and Python Programming	Major	3	
2.	Fundamentals of Information Technology	Major	3	9
3.	Database Management System	Major (Elective)[13]	3	
4.	Web Technology	Major (Elective)[3]	3	
5.	Minor 2 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	3	3
6.	Environmental Chemistry	Multidisciplinary	3	3
7.	Modern Indian Language 1 or Business Communication and Information Ethics	AEC	3	3
8.	Introduction to Remote Sensing	SEC	2	2
9.	Ancient Indian Sustainable Practices	VAC	2	
10.	Constitutional Values and Fundamental Duties	VAC	2	4
Total credits earned			**24**	**24**
Total credits earned at the end of first year = 22 + 24 = 46 (Minimum requirement: 40)				
11.	Vocational course/ Summer internship project (8-weeks) to Exit with UG-Certificate in Data Science	Vocational/ Internship [14]	4	4
Total credits earned for UG Certificate = 22 + 24 + 4 = 50 (Minimum requirement: 44)				

EXIT Level 4.5: UG Certificate in Data Science [Credits earned: 50]

Year 2: Semester 3

S.No.	Course	Type	Credit	Credits earned
1.	Data Wrangling and Visualization	Major	3	
2.	Data Structures and Algorithm	Major	3	9
3.	Data Mining and Data Analysis	Major	3	
4.	Minor 3 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	3	3
5.	Advanced Statistics/ Linear Algebra and Discrete Mathematics/ Bioinformatics	Multidisciplinary (Elective)	4	4
6.	Modern Indian Language 2	AEC	3	3
7.	Introduction to Geographic Information System	SEC	3	3
8.	Cybersecurity for Data Science	SEC	2	2
Total credits earned			**24**	**24**

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[13] Choose one Major elective

[14] Students exiting the programme after securing minimum 40 credits will be awarded UG Certificate in Data Science provided they secure additional 4 credits in work-based vocational courses offered during summer-term or internship/apprenticeship in addition to 6 credits from skill-based courses earned during 2nd semester.

Year 2: Semester 4

S.No.	Course	Type	Credit	Credits earned
1.	Artificial Intelligence	Major	4	
2.	Time Series Analysis	Major	4	
3.	Object Oriented Programming	Major	4	16
4.	Computer Networks	Major (Elective)[15]	4	
5.	Business Analytics	Major (Elective)[5]		
6.	Minor 4 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	4	4
Total credits earned			**20**	**20**
Credits earned in 2nd year = 24 + 20 = 44				**43**
Credits earned at end of the 2nd year = 46 + 44 = 90 (Minimum requirement: 80)				
7.	Vocational course/ Summer internship project (8-weeks) to Exit with UG-Diploma in Data Science	Vocational course[16]	4	4
Total credits earned for UG Diploma = 46 + 44 + 4 = 94 (Minimum requirement: 84)				

EXIT 5: UG Diploma in Data Science [Credits earned: 94]

Year 3: Semester 5

S.No.	Course	Type	Credit	Credits earned
1.	Machine Learning	Major	4	
2.	Analysis and Design of Algorithms	Major	4	12
3.	Blockchain	Major	4	
4.	1st Minor 5 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	4	8
5.	2nd Minor 5 to be selected from Environmental Studies/Economics /Management Stream	Minor (Elective)	4	
Total credits earned			**20**	**20**

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[15] Choose one elective

[16] Students exiting the programme after securing minimum 80 credits will be awarded UG Diploma in Data Science provided they secure additional 4 credits in work-based vocational courses offered during first year or second year summer-term.

Year 3: Semester 6

S.No.	Course	Type	Credit	Credits earned
1.	Big Data Technology	Major	4	
2.	Natural Language Processing	Major	4	12
3.	Predictive Modelling and Analytics	Major	4	
4.	1st Minor 6 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	4	
	2nd Minor 6 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	4	8
Total credits earned			**20**	**20**
Credits earned in 3rd year = 20 + 20 = 40				**40**
Credits earned at end of the 3rd year = 46 + 44 + 40 = 130				
5.	Summer internship project (8-weeks) to Exit 3-Year UG Degree	Internship[17]	4	4
Total credits earned for 3-year UG Degree = 46 + 44 + 40 + 4 = 134 (Minimum requirement: 120)				

EXIT 5.5: 3-year B.Sc. in Data Science [Credits earned: 134]

Year 4: Semester 7

S.No.	Course	Type	Credit	Credits earned
1.	Soft-Computing	Major	4	
2.	Data Warehousing and Data Pipeline	Major	4	
3.	Research Methodology and Thesis Writing	Major	2	14
4.	Internet of Things	Major (Elective)[18]	4	
5.	Cloud Computing	Major (Elective)[8]	4	
6.	1st Minor 7 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	3	
7.	2nd Minor 7 to be selected from Environmental Studies /Economics /Management Stream	Minor (Elective)	3	6
8.	Principles and Concepts of Sustainability @	VAC	2	2
Total credits earned			**20+2**	**22@**

@ VAC Introduce in case students from other institutions have not opted for such courses in B.Sc.

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[17] Students exiting the programme after securing minimum 120 credits will be awarded 3-Year B.Sc. Degree in Data Science provided they secure additional 4 credits in internship courses offered during first year or second year or third year summer-term.

[18] Choose one elective.

Year 4: Semester 8

S.No.	Course	Type	Credit	Credits earned
1.	Introduction to Deep Learning	Major	4	8
2.	Parallel Programming	Major	4	
3.	Minor 8 to be selected from Environmental Studies /Economics /Management Stream	Minor	4	4
4.	Spatial Data Analysis and Modelling	Major[19]	4	12
5.	Environmetrics	Major[9]	4	
6.	Environmental Finance and Economics	Major[9]	4	
7.	Research Project/Dissertation	Dissertation[20]	12	12
Total credits earned			**24**	**24**
Credits earned in 4th year = 20 + 24 = 44			**44**	**44**
Credits earned at end of the 4th year = 46 + 44 + 40 + 44 = 174				
8.	Summer internship project (8-weeks) to Exit 4-Year UG Degree	Internship[21]	4	4
Total credits earned for 4-year UG Degree = 46 + 44 + 40 + 44 + 4 = 178 (Minimum requirement: 160)				

EXIT 6: 4-year B.Sc. in Data Science (Honours/ Honours with Research) [Credits earned: 178]

Five-Year Integrated Post-Graduate Programme (FYIPP) in Data Science [M.Sc. in Data Science]

Year 5: Semester 9

S.No.	Course	Type	Credit	Credits earned
1.	Advanced Machine Learning	Major	4	12
2.	Recent Trends in Data Science	Major	4	
3.	Big Data Ethics and Data Communication	Major (Elective)[22]	4	
4.	Location Analytics	Major (Elective)[11]	4	
5.	1st Minor 9 to be selected from Environmental Studies /Economics /Management Stream	Minor	4	8
6.	2nd Minor 9 to be selected from Environmental Studies /Economics /Management Stream	Minor	4	
Total credits earned			**20**	**20**

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[19] Students exiting the programme after securing minimum 160 credits will be awarded 4-year UG Degree (Honours) in Data Science after doing at least 3 courses for 12 credits in lieu of a research project/dissertation.

[20] Students who secure 75% marks and above in the first six semesters and wish to undertake research at the UG level can choose a research stream in the fourth year by doing a research project or dissertation under the guidance of a faculty member of the University; the students who secure at least 160 credits, including 12 credits from a research project/dissertation can exit the programme with 4-year UG Degree (Honours with Research) in Data Science.

[21] Students exiting the programme after securing minimum 160 credits will be awarded 4-Year B.Sc. (Honours/Honours with Research) Degree in Data Science provided they secure additional 4 credits internship courses offered during first year or second year or third year or fourth year summer-term.

[22] Choose one elective.

Year 5: Semester 10

S.No.	Course	Type	Credit	Credits earned
1.	4 Major courses in Data Science and 1 Minor Course from other discipline or Major Project*	4 Major + 1 Minor/ Major project Dissertation	20	20
Total credits earned			**20**	**20**
Credits earned in 5ᵗʰ year = 20 + 20 = 40			**40**	**40**
Credits earned at end of the 5ᵗʰ year = 20 + 20 = 40				
Total credits earned for Degree (UG + PG) = 174 + 40 = 214 (Minimum requirement: 200)				

* To be approved by the Academic Council

EXIT 6.5: 5-year M.Sc.[23] **in Data Science [Credits earned: 214]**

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[23] The student exits the 5-year integrated programme with degrees – B.Sc. (Honours/Honours with Research) and M.Sc. in Data Science

Five Years Course Distribution of Integrated Master Programme in Data Science

Semester	Discipline Specific Courses - Core / Major	Minor	Inter-disciplinary courses	Ability Enhancement courses (language)	Skill Enhancement courses /Internship /Dissertation	Common Value-Added Courses	Vocational course/ Summer internship	Research Project/ Dissertation	Total Credits
I	10	4	2	2	2	2	0	-	22
II	9	3	3	3	2	4	4*		24
Students exiting the programme after **securing 40 credits will be awarded UG Certificate** in the relevant Discipline /Subject **provided they secure 4 credits in work based vocational courses offered during summer term or internship / Apprenticeship** in addition to 6 credits from skill-based courses earned during first and second semester.									**46+4**
III	9	3	4	3	5	-	-	-	24
IV	16	4	0	0	0	0	4**	-	20
Students exiting the programme after **securing 80 credits will be awarded UG Diploma** in the relevant Discipline /Subject **provided they secure additional 4 credit in skill based vocational courses** offered during first year or second year summer term.									**90 +4**
V	12	8	-	-	-	-	-	-	20
VI	12	8	-	-	-	-	4**	-	20
3-Year B.Sc. in Data Science: Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline /Subject upon securing 120 credits									**130 +4**
VII	14	6	-	-	-	2	-	-	20
VIII	20	4	-	-	-	-	4**	12#	24
4-Year B.Sc. (Honours/ Honours with Research) **in Data Science:** Students will be awarded UG Degree (Honours/ Honours with Research) in the relevant Discipline /Subject									**174+4**
IX	12	8	-	-	-	-	-	-	20
X	-	-	-	-	-	-	4	16	20
5-Year M.Sc. in Data Science: Students will be awarded PG Degree in the relevant Discipline /Subject									**214**

*Applicable only when the student wants to exit the programme.

** Student can exit the programme without earning 4 credits in the second year, provided the credit requirement is completed in the first-year under Vocational course/ Summer internship.

4-Year B.Sc. (Honours with Research) students will opt in-house 12 credits of Research Project/ Dissertation requirement and it will be considered as core (major).

5.3 Economics

The field of economics has become indispensable part of any decision-making process. In the face of scarcity, the effective use of resources becomes a problem of prime importance. Within economics, issues like consumption, production, employment, savings and investment, money, banking system, development policies, taxation, international trade, environment and others that form the core of this subject. To tackle these issues, a strong analytical foundation comprising mathematics, statistics, and econometrics is necessary. The FYUP is aimed at ensuring that students learn the required tools, analyse economic issues and apply them to real world economic issues and contribute to policy discussions.

The programme builds right from the fundamentals of economics. The students will be initially introduced to some basic courses on Microeconomics and Macroeconomics relating them to practical economic issues. For the initial years the focus is on training students in the tools required to study economics such as Mathematics and Statistics along with intuitive and application-based understanding of ideas in microeconomics and macroeconomics. In the later years, the programme gradually progresses towards more advanced economic analysis along with the tools required to understand those. The programme spans a wide range of applied papers in the advanced stages of the programme to bring our students in line with the contemporary discussions in economics and align them with the frontier of the knowledge in the field.

The programme has been structured in order to provide in-depth study of Economics as a major discipline with an option to choose from interdisciplinary minors and skill-based courses relating to a chosen thematic area – data science, environmental studies, climate science, geoinformatics and management studies.

5.3.1 Four-Year Under-Graduate Programme (FYUP) in Economics (B.Sc. Honours/B.Sc. Honours with research)

5.3.2 Eligibility

To enter the FYUP in Economics, students must meet the following prerequisites:
A Senior Secondary School Examination (12th grade: 10+2) certificate in any discipline or equivalent, from a recognized Board of Education with at least 50% marks in aggregate with Mathematics or Applied Mathematics in Grade 12. There is no age bar.

5.3.2 Admission process

Admission to FYUP in Economics shall be on the basis of merit of marks secured in 10+2 or equivalent examination in aggregate of best of three subjects and one language.

Year 1: Semester 1

S.No.	Course	Type	Credit	Credits earned
1.	Principles of Economics	Major	4	8
2.	Introductory Mathematical Methods for Economics	Major	4	
3.	Minor 1 to be selected from Data Science/Environmental Studies/Management Stream	Minor (elective)	4	4
4.	Fundamentals of Data Science	Multidisciplinary	2	2
5.	Fundamentals of Computers and Programming	SEC	2	2
6.	Communication Skills and Technical Writing	AEC	2	2
7.	Principles and Concepts of Sustainability	VAC	2	2
Total Credits earned			**20**	**20**

Year 1: Semester 2

S.No.	Course	Type	Credit	Credits earned
1.	Introductory Statistical and Econometric Methods	Major	4	8
2.	Introduction to Development Economics	Major	4	
3.	Minor 2 from Data Science/Environmental Studies/Management Stream	Minor (elective)	3	3
4.	Problem-Solving and Python Programming	Multidisciplinary	3	3
5.	Modern Indian Language 1 or Business Communication and Information Ethics	AEC (elective)	3	3
6.	Behavioural Science	SEC	2	2
7.	Ancient Indian Sustainable Practices	VAC	2	4
8.	Constitutional Values and Fundamental Duties	VAC	2	
Total Credits earned in 2nd semester			**23**	**23**
Total credits earned at the end of first year = 20 + 23 = 43 (Minimum requirement: 40)				
9.	Vocational course/ Summer internship (8-weeks) to Exit with UG-Certificate	Vocational/ Internship	4	4
Total credits earned for UG Certificate = 20+ 23 + 4 = 47 (Minimum requirement: 44)				

EXIT Level 4.5: UG-Certificate in Economics [Credits earned: 47]

Year 2: Semester 3

S.No.	Course	Type	Credit	Credits earned
1.	Intermediate Microeconomics-I	Major	4	12
2.	Basic Mathematics for Economics	Major	4	
3.	Intermediate Macroeconomics-I	Major	4	
4.	Minor 3 from Data Science/Environmental Studies/Management Stream	Minor (elective)	3	3
5.	Linear Algebra and Discrete Mathematics/ Advanced Statistics	Multidisciplinary (elective)	4	4
6	Modern Indian Language 2	AEC	3	3
7.	Data Visualization or Cybersecurity for Data Science	SEC (elective)	2	5
8.	Team Building	SEC	3	
Total Credits earned			**27**	**27**

Year 2: Semester 4

S.No.	Course	Type	Credit	Credits earned
1.	Intermediate Microeconomics-II	Major	4	16
2.	Intermediate Statistical Methods for Economics	Major	4	
3.	Intermediate Macroeconomics-II	Major	4	
4	Economic History of India	Major	4	
5.	Minor 4 from Data Science/Environmental Studies/Management Stream	Minor (elective)	4	4
Credits earned			**20**	**20**
Credits earned in 2nd year = 27 + 20 = 47			**47**	**47**
Total Credits earned at end of the 2nd year = 43 + 47 = 90 (Minimum requirement 80)				
6	Vocational course/Summer internship project (8-weeks) to Exit with UG-Diploma	Vocational/Internship	4	4
Total credits earned for UG Diploma = 43 + 47 + 4 = 94 (Minimum requirement: 84)				

EXIT Level 5: UG-Diploma in Economics [Credits earned: 94]

Year 3: Semester 5

S.No.	Course	Type	Credit	Credits earned
1.	Game Theory	Major	4	
2.	Econometrics-I	Major	4	
3.	Growth Economics	Major	4	16
4	Issues in Indian Economy	Major	4	
5	Minor 5 from Data Science/Environmental Studies/Management Stream	Minor (elective)	4	4
Total Credits earned			**20**	**20**

Year 3: Semester 6

S.No.	Course	Type	Credit	Credits earned
1.	Development Economics	Major	4	
2.	International Trade Theory and Policy	Major	4	
3.	International Finance and Capital Flows	Major	4	16
4.	Econometrics -II	Major	4	
5.	Minor 6 from Data Science/Environmental Studies/Management Stream	Minor (elective)	4	4
Total Credits earned			**20**	**20**
Credits earned in 3rd year = 20 + 20 = 40				
Credits earned at end of the 3rd year = 43 + 47 + 40 = 130				
6	Summer internship project (8-weeks) to Exit 3-Year UG Degree	Internship	4	4
Total credits earned for 3-year UG Degree = 43 + 47 + 40 + 4 = 134 (Minimum requirement: 120 credits)				

EXIT Level 5.5: 3-year UG Degree in Economics [Credits earned: 134]

Year 4: Semester 7

S.No.	Course	Type	Credit	Credits earned
1.	Environmental Economics	Major	4	
2.	Research Methodology	Major	4	
3.	Econometrics using R	Major	4	16
4.	Behavioural Economics/ Public Economics/ Global Political Economy/ History of Economic Thought	Major (elective)	4	
5.	Minor 7 from Data Science/Environmental Studies/Management Stream	Minor (elective)	4	4
Total Credits earned			**20**	**20**

Year 4: Semester 8

S.No.	Course	Type	Credit	Credits earned
1.	Energy and Resource Economics	Major	4	
2.	Financial Economics	Major	4	12
3.	Health Economics	Major	4	
4.	Minor 8 from Data Science/Environmental Studies/Management Stream	Minor (elective)	4	4
5.	Climate Change Economics	Major	4	
6.	Public Economics/Industrial Organization/Money & Banking/Law & Economics	Major (elective)	4	12
7.	Impact Evaluation	Major	4	
8.	Research Project/Dissertation	Dissertation	12	12
Total Credits earned			**28**	**28**
Credits earned in 4th year = 20 + 28 = 48			**48**	**48**
Credits earned at end of the 4th year = 43 + 47 + 40 + 48 = 178				
9.	Summer internship project (8-weeks) to Exit 4-Year UG Degree	Internship	4	4
Total credits earned for 4-year UG Degree = 43 + 47 + 40 + 48 + 4 = 182 (Minimum requirement: 160 credits)				

EXIT Level 6: 4-year B.Sc. in Economics (Honours /Honours with Research) [Credits earned: 182]

Four Year Course Distribution B.Sc. (Honours /Honours with Research) in Economics

Semester	Discipline Specific Courses -Core / Major	Minor	Inter-disciplinary courses	Ability Enhancement courses (language)	Skill Enhancement courses /Internship /Dissertation	Common Value-Added Courses	Vocational course/ Summer internship	Research Project/ Dissertation	Total Credits
I	8	4	2	2	2	2	-	-	20
II	8	3	3	3	2	4	4*	-	23
Students exiting the programme after **securing 40 credits will be awarded UG Certificate** in the relevant Discipline /Subject **provided they secure 4 credits in work based vocational courses offered during summer term or internship / Apprenticeship** in addition to 6 credits from skill-based courses earned during first and second semester.									**43+4**
III	12	3	4	3	5				27
IV	16	4					4**		20
Students exiting the programme after **securing 80 credits will be awarded UG Diploma** in the relevant Discipline /Subject **provided they secure additional 4 credit in skill based vocational courses** offered during first year or second year summer term.									**90 +4**
V	16	4	-	-	-	-	-	-	20
VI	16	4	-	-	-	-	4**	-	20
3-Year B.Sc. in Economics: Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline /Subject upon securing 120 credits									**130 +4**
VII	16	4	-	-	-	2	-	-	20
VIII	24	4	-	-	-	-	4**	12#	28
4-Year B.Sc. (Honours/ Honours with Research) **in Economics:** Students will be awarded UG Degree (Honours/ Honours with Research) in the relevant Discipline /Subject									**178 +4**

*Applicable only when the student wants to exit the programme.
** Student can exit the programme without earning 4 credits in the second year, provided the credit requirement is completed in the first-year under Vocational course/ Summer internship.
# 4-Year B.Sc. (Honours with Research) students will opt in-house 12 credits of Research Project/ Dissertation requirement and it will be considered as core (major).

5.4   Business Administration

The FYUP is designed to impart a comprehensive knowledge and understanding of business administration and management. The programme is designed to cater to the interdisciplinary and industry specific needs of the future world. The FYUP BBA offers not only a wide range of core managerial and administration-related subjects but also an option to do minor specialization in areas such as data science, environmental science and economics. A combination of various such domains would equip the graduates to explore diverse career opportunities.

Further, beyond general management, the programme offers four core specializations in select disciplines of human resources management, finance, operations management, marketing management, and sustainability management. TERI-SAS being a pioneer in sustainability education with a key focus on areas related to climate change, climate financing, ESG strategies, energy and water management, economics and policies for a sustainable future and lifestyle for the environment, provides unique opportunities to its students to interact and engage with faculty and industry leaders in developing further skills in these futuristic domains. Further, the programme comes with a unique opportunity to pursue BBA Honours with Research to help interested students in pursuing a research career.

5.4.1 Four-Year Under-Graduate Programme (FYUP) in Business Administration (BBA Honours/ BBA Honours with research)

5.4.2   Eligibility

To enter the FYUP in Business Administration students must meet the following prerequisites: A Senior Secondary School Examination (12th grade: 10+2) certificate in any discipline or equivalent, from a recognized Board of Education with at least 50% marks in aggregate. There is no age bar.

5.4.3   Admission criteria

Admission to FYUP in Business Administration shall be on the basis of Group Discussion followed by an Interview. The candidates shall be called for Group Discussion (GD) and Interview on the basis of marks secured in 10+2 or equivalent examination in aggregate of best of three subjects and one language. The merit list shall be prepared based on combined marks in group discussion and interview.

Year 1: Semester 1

S. No.	Course	Type	Credit	Credits earned
1	Financial Accounting	Major	4	8
2	Principles of Management	Major	4	
3	Minor 1 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	4
4	Environment and Society	Multidisciplinary	2	2
5	Communication Skills and Technical Writing	AEC	2	2
6	Fundamentals of Computers and Programming	SEC	4	4
7	Principles and Concepts of Sustainability	VAC	2	2
Total Credits earned			**22**	**22**

Year 1: Semester 2

S. No.	Course	Type	Credit	Credits earned
1	Marketing Management I	Major	4	8
2	Organisational Behaviour	Major	4	
3	Minor 2 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	3	3
4	Introduction to Mathematics and Statistics	Multidisciplinary	4	4
5	Modern Indian Language	AEC	3	3
6	Behavioural Science	SEC	2	2
7	Ancient Indian Sustainable Practices	VAC	2	4
8	Constitutional Values and Fundamental Duties	VAC	2	
Total Credits earned			**24**	**24**
Credits earned in 2nd year = 22 + 24= 46			**46**	**46**
Total credits earned at the end of first year = 22 + 24 = 46 (Minimum requirement: 40)				
9	Vocational course/ Summer internship project (8-weeks) to Exit with UG-Certificate	Vocational/Internship	4	4
Total credits earned for UG Certificate = 22 + 24+ 4 = 50 (Minimum requirement: 44)				

EXIT Level 4.5: UG-Certificate Business Administration [Credits earned: 50]

Year 2: Semester 3

S.No.	Course	Type	Credit	Credits earned
1	Marketing Management II	Major	4	8
2	Introduction to Operations Management	Major	4	
3	Minor 3 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	3	3
4	Data analysis and spreadsheet modelling	Multidisciplinary	3	3
5	Modern Indian Language 2	AEC	3	3
6	Data Visualization	SEC	2	2
7	Team Building	SEC	3	3
Total Credits earned			**22**	**22**

Year 2: Semester 4

S.No.	Course	Type	Credit	Credits earned
1	Human Resource Management	Major	4	
2	Management Accounting	Major	4	
3	Economic environment and business implication	Major	4	16
5	Business law	Major	4	
6	Minor 4 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	4
Total Credits earned			**20**	**20**
Credits earned in 2nd year = 22 + 20= 42			**42**	**42**
Total Credits earned at end of the 2nd year = 46 + 42 = 88 (Minimum requirement: 80)				
7	Vocational course/Summer internship project (8-weeks) to Exit with UG-Diploma	Vocational/Internship	4	4
Total credits earned for UG Diploma = 46 + 42 + 4 = 92 (Minimum requirement: 84)				

EXIT Level 5: UG-Diploma in Business Administration [Credits earned: 92]

Year 3: Semester 5

S.No.	Course	Type	Credit	Credits earned
1	Entrepreneurship and startup ecosystems in India	Major	4	
2	Design thinking and critical analysis	Major	4	12
3	Operations Research	Major	4	
4	1st Minor 5 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	8
5	2nd Minor 5 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	
Total Credits earned			**20**	**20**

Year 3: Semester 6

S.No.	Course	Type	Credit	Credits earned
1	Financial Management	Major	4	
2	Business Research Methods	Major	4	12
3	Supply Chain Management	Major	4	
4	1st Minor 6 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	
5	2nd Minor 6 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	8
Total Credits earned			**20**	**20**
Credits earned in 3rd year = 20 + 20 = 40			**40**	**40**
Credits earned at end of the 3rd year = 46+ 42 + 40 = 128				
6	Summer internship project (8-weeks) to Exit 3-Year UG Degree	Internship	4	4
Total credits earned for 3-year UG Degree = 46+ 42 + 40 + 4 = 132 (Minimum requirement: 120)				

EXIT Level 5.5: 3-Years BBA Degree [Credits earned: 132]

Year 4: Semester 7

S.No.	Course	Type	Credit	Credits earned
1	Strategic management	Major	4	
2	Entrepreneurship development and SME	Major	4	8
3	One Elective to be selected from HR/FIN/OP/MKT	Major (Elective)	4	
4	One Elective to be selected from HR/FIN/OP/MKT	Major (Elective)	4	8
5	1st Minor 7 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	3	3
7	AI for everyone	VAC	2	2
Total Credits earned			**21**	**21**

Year 4: Semester 8 (BBA – Honours/ Honours with Research)

S.No.	Course	Type	Credit	Credits earned
1	Entrepreneurship for sustainable business	Major	4	8
2	Global business operations/International Business	Major	4	
3	Minor 8 to be selected from Data Science /Economics /Environmental Studies Stream	Minor	4	4
4	One Elective to be selected from HR/FIN/OP/MKT	Major (Elective)	4	12
5	One Elective to be selected from HR/FIN/OP/MKT	Major[28] (Elective)	4	
6	One Elective to be selected from HR/FIN/OP/MKT	Major[28] (Elective)	4	
7	Research Project/Dissertation	Dissertation	12	12
Total Credits earned			**24**	**24**
Credits earned in 4th year = 21 + 24 = 45				**44**
Credits earned at end of the 4th year = 46 + 42 + 40+ 45= 173				
Total credits earned for 4-year UG Degree = 46 + 42 + 40+ 45 = 173 (Minimum requirement: 160)				

EXIT Level 6: 4-Years BBA (Honours/ Honours with Research) [Credits earned: 173]

Four Year Course Distribution BBA (Honours/ Honours with Research)

Semester	Discipline Specific Courses -Core /Major	Minor	Inter-disciplinary courses	Ability Enhancement courses (language)	Skill Enhancement courses /Internship /Dissertation	Common Value-Added Courses	Vocational course/ Summer internship	Research Project/ Dissertation	Total Credits
I	10	4	2	2	2	2	-	-	22
II	9	3	3	3	2	4	4*	-	24
Students exiting the programme after **securing 40 credits will be awarded UG Certificate** in the relevant Discipline /Subject **provided they secure 4 credits in work based vocational courses offered during summer term or internship / Apprenticeship** in addition to 6 credits from skill-based courses earned during first and second semester.									**46+4**
III	8	3	3	3	5				22
IV	16	4					4**		20
Students exiting the programme after **securing 80 credits will be awarded UG Diploma** in the relevant Discipline /Subject **provided they secure additional 4 credit in skill based vocational courses** offered during first year or second year summer term.									**88 +4**
V	12	8	-	-	-	-	-	-	20
VI	12	8	-	-	-	-	4**	-	20
3-Year BBA: Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline /Subject upon securing 120 credits									**128 +4**
VII	15	6	-	-	-	2	-	-	21
VIII	8	4	-	-	-		4**	12	24
4-Year Honours/ Honours with Research) **in BBA:** Students will be awarded UG Degree (Honours/ Honours with Research) in the relevant Discipline /Subject									**173**

*Applicable only when the student wants to exit the programme.

** Student can exit the programme without earning 4 credits in the second year, provided the credit requirement is completed in the first-year under Vocational course/ Summer internship.

5.5 Number of Seats

Sl. No.	Academic Programmes	Number of seats available (Maximum)
1.	Four Year Under-Graduate Programme in Data Science (BSc Honours/BSc Honours with Research)	40
2	Four Year Under-Graduate Programme in Environmental Studies (BSc Honours/BSc Honours with Research)	40
3.	Five Year Integrated Post-Graduate Programme in Data Science (MSc in Data Science)	30
4.	Five Year Integrated Post-Graduate Programme in Environmental Studies (MSc in Environmental Studies)	30
5.	Four Year Under-Graduate Programme in Economics (BSc Honours /BSc Honours with research)	60
6.	Four Year Under-Graduate Programme in Business Administration (BBA Honours/ BBA Honours with research)	120

TERI SAS follows a 5% affirmative policy covering all non-general categories for admission to all UG programmes.

5.6   Fee

5.6.1   Fee structure and payments details for India Students (all figures in INR)

S.No	Programmes	Admission fee	Semester-wise tuition fee											Total
		One-time payment	1st Sem	2nd Sem	3rd Sem	4th Sem	5th Sem	6th Sem	7th Sem	8th Sem	9th Sem	10th Sem		Total
			Certificate		Diploma		B.Sc		B.Sc Honours		Masters			
A	**Introduction of Multi-Track Integrated Master Programmes/Undergraduate Programme/Post Graduate Diploma**													
1	4 Year Under Graduate Programme in Environmental Science BSc (Honours)/ (Honours with research)	20,000	1,20,000	1,20,000	1,26,000	1,26,000	1,32,300	1,32,300	1,38,900	1,38,900	-	-		10,54,400
2	5 Year Integrated Post Graduate Programme in Environmental Science (M.Sc)	20,000	1,20,000	1,20,000	1,26,000	1,26,000	1,32,300	1,32,300	1,38,900	1,38,900	1,45,900	1,45,900		13,46,200
3	4 Year Under Graduate Programme in Economics BSc (Honours)/ (Honours with research)	20,000	1,20,000	1,20,000	1,26,000	1,26,000	1,32,300	1,32,300	1,38,900	1,38,900	-	-		10,54,400

S.No	Programmes	Admission fee	Semester-wise tuition fee										Total
		One-time payment	1st Sem	2nd Sem	3rd Sem	4th Sem	5th Sem	6th Sem	7th Sem	8th Sem	9th Sem	10th Sem	
			Certificate		Diploma		B.Sc		B.Sc Honours		Masters		
4	4 Year Under Graduate Programme in Data Science BSc (Honours)/ (Honours with research)	20,000	1,45,000	1,45,000	1,52,300	1,52,300	1,60,000	1,60,000	1,68,000	1,68,000	-	-	12,70,600
5	5 Year Integrated Post Graduate Programme in Data Science (M.Sc)	20,000	1,45,000	1,45,000	1,52,300	1,52,300	1,60,000	1,60,000	1,68,000	1,68,000	1,76,400	1,76,400	16,23,400
6	4 Year Under Graduate Programme in Business Administration (Honours)/ (Honours with research)	20,000	1,45,000	1,45,000	1,52,300	1,52,300	1,60,000	1,60,000	1,68,000	1,68,000	-	-	12,70,600

5.6.2   Fee structure and payments details for International Students (all figures in US $)

S.No	Programmes	Semester-wise tuition fee										Total
		1st Sem	2nd Sem	3rd Sem	4th Sem	5th Sem	6th Sem	7th Sem	8th Sem	9th Sem	10th Sem	
		Certificate		Diploma		B.Sc		B.Sc Honours		Masters		
1	4 Year Under-Graduate Programme in Environmental Science BSc (Honours)/ (Honours with research)	Developing countries										
		2000	2000	3750	3750	5000	5000	6750	6750			35000
		Developed countries										
		4000	4000	7500	7500	10000	10000	13500	13500			70000
2	5 Year Integrated Post-Graduate Programme in Environmental Science (M.Sc)	Developing countries										
		2000	2000	3750	3750	5000	5000	6750	6750	8500	8500	52000
		Developed countries										
		4000	4000	7500	7500	10000	10000	13500	13500	17000	17000	104000
3	4 Year Under-Graduate Programme in Economics BSc (Honours)/ (Honours with research)	Developing countries										
		2000	2000	3750	3750	5000	5000	6750	6750			35000
		Developed countries										
		4000	4000	7500	7500	10000	10000	13500	13500			70000
4	4 Year Under-Graduate Programme in Data Science BSc (Honours)/ (Honours with research)	Developing countries										
		2250	2250	4000	4000	6000	6000	8250	8250			41000
		Developed countries										
		4500	4500	8000	8000	12000	12000	16500	16500			82000
5		Developing countries										

S.No	Programmes	Semester-wise tuition fee										
		1st Sem	2nd Sem	3rd Sem	4th Sem	5th Sem	6th Sem	7th Sem	8th Sem	9th Sem	10th Sem	Total
		Certificate		Diploma		B.Sc		B.Sc Honours		Masters		
	5 Year Integrated Post-Graduate Programme in Data Science (M.Sc)	2250	2250	4000	4000	6000	6000	8250	8250	10500	10500	62000
		Developed countries										
		4500	4500	8000	8000	12000	12000	16500	16500	21000	21000	124000
6	4 Year Under-Graduate Programme in Business Administration (Honours)/ (Honours with research)	Developing countries										
		2250	2250	4000	4000	6000	6000	8250	8250			41000
		Developed countries										
		4500	4500	8000	8000	12000	12000	16500	16500			82000

5.6.3 Refund policy

As per UGC notification on Refund of fees dated October, 2018.If a student chooses to withdraw from the programme of study in which he/she is enrolled, the institution concerned shall follow the following five-tier system for the refund of fees* remitted by the student.

S.No.	Percentage of refund of fees*	Point of time when notice of withdrawal of admission is received in the HEI
1	100%	15 days or more before the formally-notified last date of admission
2	90%	Less than 15 days before the formally-notified last date of admission
3	80%	15 days or less after the formally-notified last date of admission
4	50%	30 days or less, but more than 15 days, after formally-notified last date of admission
5	00%	More than 30 days after formally-notified last date of admission

Note: *

In case of (1) in the table above, the HEI concerned shall deduct an amount not more than 5%of the fees paid by the student, subject to a maximum of Rs. 5,000/- as processing charges from the refundable amount.

Fees shall be refunded by all HEIs to an eligible student within fifteen days from the date of receiving a written application from his/her in this regard.