

(Abstract)

M Sc Geography Programme in the Department of Geography, Swami Anantha Theertha Campus, Payyanur - Revised Scheme & Syllabus (1st Semester Only) - Approved- Implemented w.e f 2023 admission- Orders Issued

ACADEMIC C SECTION

ACAD C/ACAD C3/24382/2023

Dated: 01.12.2023

- Read:-1. U.O.No ACAD C/ ACAD C3/22373/2019 dated 12/09/2023
2. Circular No dated ACAD C/ ACAD C3/22373/2019 dated 12/09/2023
3. Email dated 14/11/2023 from the Head, Dept of Geography, SAT Campus, Payyanur
4. Minutes of the meeting of the Department Council dated 14/10/2023

ORDER

1. The revised Regulations for Post Graduate Programmes under Choice Based Credit and Semester System in the University Teaching Departments/ Schools were implemented w.e.f 2023 admissions vide paper read 1 above.
2. As per paper read 2 above, Heads of all Teaching Departments were requested to submit the revised Syllabus in accordance with the approved Regulations along with a copy of the Department Council Minutes.
3. As per paper read 3 above, the Head, Department of Geography, SAT Campus, Payyanur submitted the Scheme and the Syllabus (1st Semester Only) of M.Sc Geography Programme to be implemented in the University Teaching Department w.e.f 2023 admissions.
4. Department Council vide the paper read 4 above approved the aforementioned scheme and syllabus of M.Sc Geography programme to be implemented in the Dept. of Geography, SAT Campus, Payyanur w.e.f.2023 admission.
5. The Vice Chancellor, after considering the matter in detail and in exercise of the powers of the Academic Council conferred under section 11(1), Chapter III of Kannur University Act 1996, **approved the Scheme & Syllabus (1st Semester Only) of M.Sc Geography Programme and accorded sanction to implement the same in the Department of Geography, SAT Campus, Payyanur w.e.f 2023 admissions, subject to report to the Academic Council**
6. The Scheme and Syllabus (1st Semester Only) of M.Sc Geography Programme under CBCSS implemented in the Department of Geography, SAT Campus, Payyanur with effect from 2023 admission, is appended and uploaded in the University website (www.kannuruniversity.ac.in)
7. Orders are issued accordingly.


Sd/-

Narayanadas K
DEPUTY REGISTRAR (ACAD)
For REGISTRAR

To: 1. Head, Department of Geography, SAT Campus, Payyanur
2. Convenor, Curriculum Committee

Copy To: 1. PS to VC/ PA to PVC/ PA to R
2. To Examination Branch (through PA to CE)
3. EP IV/ EXC I
4. Computer Programmer
5. Webmanager (to publish in the website)
6. SF/DF/FC



Forwarded / By Order

SECTION OFFICER





KANNUR UNIVERSITY

Master of Science (GEOGRAPHY)

REGULATIONS, SCHEME AND SYLLABUS

Choice Based Credit Semester System
(Effective from 2023 admission)

**DEPARTMENT OF GEOGRAPHY
KANNUR UNIVERSITY
Swami Anandatheertha Campus
Payyannur, Edat P.O, Kannur 670 327**

Phone 0497 2806400

M.Sc DEGREE PROGRAMME IN GEOGRAPHY

Under Choice Based Credit and Semester System

(Effective from 2023 Admission)

About the Department

The Post Graduate Department of Geography of Kannur University was established in 2003 with an intake of 12 students and housed in a rented building at Edat, about two kilometres from Payyanur town towards south. Subsequently, the Department was shifted to Swami Anandatheertha Campus of Kannur University in 2007. From the academic year 2012-13 onwards the sanctioned strength of the students for the M.Sc Degree has been enhanced to 17. In addition to this, one seat has been sanctioned to accommodate a student in each year from Lakshadweep islands. The course is being offered under Choice Based Credit and Semester System. The design of the semesters are in such a way that the students learn topics common to the general M.Sc. course in Geography of the University and specific application oriented topics in Geoinformatics. The students have to undertake a project and a field study in the final semester of the course. The major objective of the course is to train students to get an integrative perspective about the world and earth related phenomena. The Department of geography with a vision of achieving excellence and to promote professional education in the field of geography, has been developing itself with better infrastructural facilities and qualified faculties for undertaking a full range of degree programmes from post graduate to Ph.D courses in Geography. The Department was able to conduct academic and research oriented activities in many emerging and frontier areas of geography and there are many agendas to be fulfilled in this regard. In the field of research oriented activities the Department has successfully completed two minor projects funded by Kannur University. Behind every successful achievements of the Department the infrastructural facilities and sincere effort of faculties always stood as a strong support. At present the Department of Geography is well equipped with the basic infrastructural facilities which include smart class rooms, library, GIS and Remote Sensing lab, Cartography lab, and Geodesy lab. The Department is planning for conducting multiple courses in future to mould the Department of Geography of Kannur University as a Center of Excellence in Earth sciences.

Course Details

The M.Sc. Programme shall be offered in four semesters during a period of two academic years. Each semester will have 17-18 weeks duration. The minimum duration for completion of the programme is four semesters. The maximum period for the completion of the programme is eight semesters. The programme is offered at the Department of Geography, Swami Ananthatheertha Campus of Kannur University situated at Edat, Payyanur. The programme is based on Choice Based Credit and Semester system. A total of 80 credits shall be the minimum for successful completion of the programme in which a minimum of 60 credits for core courses and 20 credits for electives are mandatory. The number of periods allotted per week for a topic is considered as its credit. For practical, three hours is considered as one credit. Elective courses will be offered depending on the availability of the teaching staff /resource person at that time. At least 10 students have to register for an offered elective course

Programme Objective

The aim of Master of Science in Geography programme is to provide up to date instruction to our students to meet the requirement of trained manpower in Geography for teaching, research, technological and other vocations mainly to benefit the aspiring students and to contribute to society in a responsible way.

Choice Based Credit Semester System

The Choice based Credit Semester System provides an opportunity for the students to choose courses from the prescribed courses comprising core and elective courses. The courses are evaluated following the grading system, which provides uniformity in the evaluation and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations which enables the student to move across institutions of higher learning. The uniformity in evaluation system also enables the potential employers in assessing the performance of the candidates.

Programme Details

The first semester consists of five core course. In the second semester, there are 3 core courses and 6 elective courses. Among elective courses, two courses (Interdisciplinary and Skill development) courses of 2 credits each should be obtained from from other departments. In the third semester, there are 3 core and 4 elective. Among elective courses, The Open Elective courses should be obtained from from other departments. In Fourth semester, there four core course with 16 credits and one elective courses of 3 credits each. During the fourth semester, each student shall carry out project under the supervision of a teaching staff of the Department nominated by the Head of the Department. The departmental council shall make decisions regarding

the project During the fourth semester, the students will have to conduct Study tour/Field work. The report of the same may be submitted to the Head of the Department for valuation.

Programme Outcomes

PO1 Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives

PO2 Problem Solving: Identify, formulate, conduct investigations, and find solutions to problems based on in-depth knowledge of relevant domains

PO3 Communication: Speak, read, write and listen clearly in person and through electronic media in English/language of the discipline, and make meaning of the world by connecting people, ideas, books, media and technology

PO4 Responsible Citizenship: Demonstrate empathetic social concern, and the ability to act with an informed awareness of issues

PO5 Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them

PO6 Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio- technological changes

PO7 Environmental Sustainability and Global Perspective: Develop an understanding of global standards to foster legal environment. Learn and practice to critically analyze the legal issues from local, national and international concerns.

Programme Specific Outcomes (PSOs) of M.Sc Geography

All the post graduate courses are at advanced level, and have been constructed as continuity over the under-graduate courses, which are seen as basic, and are taught at foundation level. The present structure thus covers the foundational aspects of the discipline, and also builds towards specialization. Programme Specific Outcomes (PSOs) of M Sc Geography of Kannur University are given below

PSO1. Analyse the dimensions of complex biophysical and social patterns in the world, and mold out young geographers with wide and deep knowledge about contemporary issues in geography.

PSO2. Critically examine various concepts, laws, theories, and models in geography and evaluate their significance at the local, regional, and global scales.

PSO3. Master and update the students in the developments in geographic information science and technology, through real-world practical applications

PSO4. Equip the learner to collect, analyze, and interpret geographic data and suggest potential solutions in socio-economic-ecological systems at the man-environment interface.

PSO5. Apply systems thinking as well as critical thinking skills to analyze contemporary issues and encourage inter-disciplinarily, multi-disciplinarily and trans-disciplinarily for developing a responsible geo community

The courses offered in the programme are addressing various dimensions and developments of the discipline and can be classifiable as follows

- A. Theoretical Base of Geography** – Courses on Nature and Philosophy of Geography, Advanced Geomorphology, Applied Climatology and Oceanography, Urban geography etc builds up the theoretical and ideological foundations of geography.
- B. Methodological Base in geographical analysis**–Courses on Principles of Remote Sensing, Principles of Geographical Information System, Natural Resource Management, Research Methods in Geography etc. strengthens the methodological foundations of geography.
- C. Systematic Approach** –Courses on Geographies of Environment and Health , Geography of Tourism, etc address the contemporary issues in Geography, both physical and human.
- D. Regional perspective** – Papers like Advanced Geography of India, Kerala Environment and Development, Social Geography with special reference to India etc perceive the regional dimensions of geography in a non-conventional way.
- E. Lab exercises & Field techniques** – Four core courses are included as *Practicals*, to equip the learner to handle the advanced tools and techniques of geographical analysis, in all semesters.
- F. Case study & Applications** – Courses on Natural Resource Management and Sustainable Development, Applied Geomorphology, Geo-informatics, Geography and Disaster Management etc are intended to carry out problem issue based and micro level analysis. Student has to carry out a Dissertation in the last semester.

Kannur University M.Sc. Geography Programme

Curriculum Structure

SEMESTER I

Course Code	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
CORE COURSES								
MSGGY01 DSC01	Nature and Philosophy of Geography	4	-	-	60	40	100	4
MSGGY01 DSC02	Advanced Geomorphology	4	-	-	60	40	100	4
MSGGY01 DSC03	Applied Climatology and Oceanography	4	-	-	60	40	100	4
MSGGY01 DSC04	Fundamentals of Geographic Information System	4	-	-	60	40	100	4
MSGGY01 DSC05	Practical – I Advanced Cartography	-	-	12	60	40	100	4
Total for Core Courses		28			300	200	500	20

SEMESTER II

Course Code	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
CORE COURSES								
MSGGY02 DSC06	Methodology of Geographical Research	4	-	-	60	40	100	4
MSGGY02 DSC07	Principles of Remote Sensing	4	-	-	60	40	100	4
MSGGY02 DSC08	Practical – II Geospatial Techniques	-	-	12	60	40	100	4
Total for Core courses		20					300	12
ELECTIVE COURSES								
MSGGY02 DSE01	Geographies of Environment and Health	2x3	-	-	60	40	100	6
MSGGY02 DSE02	Geography of Tourism							

MSGGY02 DSE03	Geography of Water Resources							
MSGGY02 DSE04	Social Geography with Special Reference to India							
INTER- DISCIPLINARY COURSES								
MSGGY02 IDC01	India – Land, People and Economy (Offered to other Department students)							
MSGGY02 IDC02	Kerala Environment and development (Offered to other Department students)	2	-	-	60	40	100	2
-----	(To be obtained from other Departments)							
SKILL ENHANCEMENT COURSES								
MSGGY02 SEC01	Fundamentals of Cartography (Offered to other Department students)							
MSGGY02 SEC01	Basics of Geographic Information System (Offered to other Department students)	2	-	-	60	40	100	2
-----	(To be obtained from other Departments)							
VALUE ADDED COURSES								
MSGGY02 VAC01	Advances in Geospatial analysis	2		-	60	40	100*	2*
	Total	30			420	280	700	22

**Not to be added to the total marks and credits*

SEMESTER III

Course Code	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
CORE COURSES								
MSGGY03 DSC09	Regional Planning and Development	4		-	60	40	100	4
MSGGY03 DSC10	Urban Geography	4		-	60	40	100	4
MSGGY03 DSC11	Practical- III Geospatial Techniques for Field Assessment	-		12	60	40	100	4
Total for Core Courses		20					300	12
ELECTIVE COURSES								
MSGGY03 DSE05	Advanced Geography of India	3		-	60	40	100	3
MSGGY03 DSE06	Geography and Disaster Management : Kerala Perspective							
MULTI DISCIPLINARY COURSES								
MSGGY03 MDC01	Fundamentals of Physical Geography (Offered to other Department students)							
MSGGY03 MDC02	Fundamentals of Human Geography (Offered to other Department students)	4			60	40	100	4
-----	----- (to be obtained from other Departments)							
Total		27			300	200	500	19

SEMESTER IV

Course No.	Course Name	Contact Hrs/Week			Marks			Credits
		L	T/S	P	ESE	CE	Total	
CORE COURSES								
MSGGY04 DSC12	Geography of Agriculture and Land Use Planning	4	-	-	60	40	100	4
MSGGY04 DSC13	Practical – IV Advanced Techniques of Geo-spatial analysis	-	-	12	60	40	100	4
MSGGY04 DSC14	Dissertation	-	-	12	100	-	100	4
MSGGY04 DSC15	Comprehensive Viva Voce and Study tour/ Field work report	-	-	-	75	25	100	4
Total for core courses		28						16
ELECTIVE COURSES								
MSGGY04 DSE07	Population and Welfare Geography	3	-	-	60	40	100	3
MSGGY04 DSE 08	Natural Resource Management and Sustainable Development							
Total		31			355	145	500	19
Grand Total (I – IV Sem)							2200	80
Marks - 2200		Core credits : 60			Elective credits : 20 ;			

<p>MS – Master of Science</p> <p>GGY – Geography</p> <p>C – Core Course</p> <p>E – Elective Course</p> <p>P – Practical Course</p>	<p>L – Lecture</p> <p>T – Tutorial</p> <p>S – Seminar</p> <p>CE – Continuous Evaluation</p> <p>ESE – End Semester Examination</p>
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DEC – Discipline Elective Course

DSC – Discipline Specific Course

SEC – Skill Enhancement Course

IDC – Inter Disciplinary Course

MDC – Multi Disciplinary Course

SEMESTER WISE CREDIT DISTRIBUTION

Course	Credit/ Paper	Semester I		Semester II		Semester III		Semester IV		Total Credits
		No. of papers	Credit	No. of papers	Credit	No. of papers	Credit	No. of papers	Credit	
Discipline Specific Course	4	5	20	3	12	3	12	4	16	60
Discipline Elective Course	3	--	--	2	6	1	3	1	3	12
Multi Disciplinary Course	2	--	--	--	--	1	4	--	--	04
Inter Disciplinary Course	2	--	--	1	2	--	--	--	--	02
Skill Enhancement Course	2	-	-	1	2	-	-	--	--	02
TOTAL		5	20	7	22	5	19	5	19	80

Semester I	
Core Course	
Course Code: MSGGY01DSC01	Course Name: NATURE AND PHILOSOPHY OF GEOGRAPHY

Description of the course:

The course Nature and Philosophy of Geography offers students the opportunity to delve into the rich history of geographical thinking, tracing its development from ancient civilizations to the present day. The course typically covers key concepts and theories that have shaped geographical thought. Moreover; the course explores the relationship between geography and other disciplines such as Anthropology, Sociology and so on. By the end of the course, students will have a solid understanding of the historical development of geographical thought and the various perspectives within the class.

Course Objectives

- To know that Geography as a discipline has evolved with time and has remained dynamic.
- To understand that geographical scholarship is intimately related larger to the ensuing socio-political processes that exists during different time periods.
- To analyse the influence of various philosophical perspectives on contemporary geography
- To know that the ever-changing content and direction of the discipline by the scholars

Credit			Teaching hours			Assessment		
L/T	P/I	Total	L/T	P/I	Total	CE	ESE	Total
4	--	4	72		72	60	40	100

L/T Lecture/Tutorials, P/I - Practical/Internship CE - Continuous Evaluation
ESE – End Semester Evaluation

COURSE OUTCOMES

Course Learning Outcomes: At the end of the course, the student will be able to

CO1	Trace the historical evolution of the philosophy of Geography.
CO2	Analyse conceptual developments in the discipline and paradigm shifts
CO3	Understand in wider sense that geographical thought is always political
CO4	Distinguishes the relationship of Geography and Geographers to the social and political struggles.
CO5	Demonstrate the inclusive nature of postmodern geographies and appreciate the metaphysical dynamism and academic progress of the discipline

COURSE CONTENTS

Module	Course Contents	No. of hours
1.0		18 hrs
1.1	Geography as a discipline; Basic concepts in the philosophy of Geography	
1.2	Historical development of Geographical Thought-Contributions to ancient, medieval and modern phases of geography	
1.3	Multidisciplinary nature of geography-Conceptual developments: Quantitative revolution, Laws, Theories, and models in Geography	
1.4	Spatial analysis, Locational analysis, Systems approach, areal differentiation, spatial integration and diffusion of innovation	

Suggested Readings Specific to the module

- Adhikari S (1992), Geographical Thought, Chaithanya Publishing House, Allahabad*
- Bonnet, Alastair, 2008. What is Geography? Sage publications*
- Castree, R, A. Rogers and D. Sherman, (2005). Questioning Geography: Fundamental Debates, Blackwell*
- Dikshit R.D (2007), Geographical Thought-A Contextual History of Ideas, Prentice Hall of India, New Delhi*
- Ellen Churchill Semple (1911) Influence of Geographic environment on the basis of Ratzel's system of Anthropogeography, New York. Russel and Russell*
- Harvey D (1969) Explanation in Geography, London*
- Holt Jenson Arid (1999). Geography: History and concepts, Sage publications*
- Majid Hussain (2007), Evolution of Geographical thought, Rawat Publication, Jaipur*

Module	Course Contents	No. of hours
2.0		18 hrs
2.1	Imperialistic influences in conceptual nature of geography-A historical discourse	
2.2	Paradigms of science-Thomas Kuhn's Model, Paradigm shift;	
2.3	Darwin's influences on geographical knowledge- Lebensraum and Darwin's influence	
2.4	Four Traditions in Geography: Dualism and dichotomies in Geography	
2.5	Environmental determinism and critics	

Suggested Readings Specific to the module

- Bassin, M (1987) Imperialism and the Nation-state in Fredrich Ratzel's political geography, Prog.Hum.Geog. 11,473-495, 1987*
- Majid Hussain (2007), Evolution of Geographical thought, Rawat Publication, Jaipur*
- Neil Roberts, "The idea of evolution in Geographical thought" in John Agnew and David N. Livingstone. The Sage handbook of Geographical knowledge, pp 441-451*

Stoddart D.R (1966) " Darwin's Impact on Geography", *Annals of the association of American Geographers*, Vol.56:683-698

<https://www.yourarticlelibrary.com/geography/impacts-of-charles-darwin-on-the-development-of-geographical-concepts/24566>

Module	Course Contents	No. of hours
3.0		18 hrs
3.1	Philosophical Influences on Modern geographical thought Positivism, Pragmatism, Functionalism, Humanism, Behaviouralism, Existentialism, Idealism	
3.2	Radical approaches in Geography- liberal and radicalism, Marxism, Anarchism	
3.3	Welfare approach in Geography; Geography as Human Ecology; Gender Geography, Feminist Geography	
3.4	Post modern Geography, Space and time, Third space by Edward Soja	

Suggested Readings Specific to the module

Benko, Georges, Strohmayer, Ulf, (1997). Space and social theory, Blackwell Publishers

Frazier J.W (1982) Applied Geography, Prentice Hall, New Delhi

Gillian Rose (1993), " Feminism and Geography: An introduction and 'Women and everyday spaces", in Geography: The limits of Geographical knowledge (Minneapolis: University of Minnesota press.

Linda McDowell and Doreen Massey (1984), "A women's place? Pp 458-475 in J. Agnew, D. Livingstone and A. Rogers (eds) Human Geography: An Essential Anthology, Oxford: Blackwell

Peet (2004), Modern Geographical thought, Blackwell publishers, Oxford

Saraswathi Raju (2013), Gendered Geographies: Space and Place in South Asia, Sage Publications

Module	Course Contents	No. of hours
4.0		18 hrs
4.1	Post structuralism and post colonialism-subaltern geographies- Decolonizing Geography	
4.2	Geographies of sexuality and queer approach, sexual identities and space	
4.3	Justice and ethics, Inequality, Geography of poverty (GOP), Geographers and policy	
4.4	Development of geographical thought in India	

Suggested Readings Specific to the module

- Johnson RJ (1985), *The future of Geography*, Methuen
Satish Kumar (2006) *Colonial and post colonial Geographies of India*, Sage Publications
Ravi S. Singh (2009) *Indian Geography: Perspectives, Concerns, and Issues*, Rawat publications, Jaipur
Minshull R (2014), *The Changing Nature of Geography*, Routledge

Core Compulsory Readings (Books, Journals, E-sources Websites/web links)

- Adhikari S (1992), *Geographical Thought*, Chaithanya Publishing House, Allahabad.
Bonnet, Alastair, (2008). *What is Geography?* Sage publications.
Dikshit R.D (2007), *Geographical Thought-A Contextual History of Ideas*, Prentice Hall of India, New Delhi
Ellen Churchill Semple (1911) *Influence of Geographic environment on the basis of Ratzel's system of Anthropogeography*. New York. Russel and Russell.
Gillian Rose (1993), "Feminism and Geography: An introduction and 'Women and Everyday spaces'", in *Geography: The limits of Geographical knowledge* (Minneapolis: University of Minnesota press.
Harvey D (1969) *Explanation in Geography*, London
Linda McDowell and Doreen Massey (1984), "A women's place? Pp 458-475 in J. Agnew, D. Livingstone and A. Rogers (eds) *Human Geography: An Essential Anthology*, Oxford: Blackwell
Neil Roberts, "The idea of evolution in Geographical thought" in John Agnew and David N. Livingstone. *The Sage handbook of Geographical knowledge*, pp 441-451
Peet (2004), *Modern Geographical thought*, Blackwell publishers, Oxford
Stoddart D.R (1966) "Darwin's Impact on Geography", *Annals of the association of American Geographers*, Vol.56:683-698.
https://link.springer.com/chapter/10.1007/978-94-009-0483-5_3
<https://journals.sagepub.com/doi/10.1068/a261021>
https://www.blackwellpublishing.co.uk/content/BPL/Images/Content_store/Sample_chapter/9780631220190/moss.pdf
https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/files/ch02.pdf

Core Suggested Readings (Books, Journals, E-sources Websites/web links)

- Bassin, M (1987) *Imperialism and the Nation state in Fredrich Ratzel's political geography*, *Prog.Hum.Geog.* 11,473-495, 1987
Benko, Georges, Strohmayer, Ulf, (1997). *Space and social theory*, Blackwell Publishers
Majid Hussain (2007), *Evolution of Geographical thought*, Rawat Publication, Jaipur
Holt Jenson Arid (1999). *Geography: History and concepts*, Sage publications
Frazire J.W (1982) *Applied Geography*, Prentice Hall, New Delhi
Ravi S. Singh (2009) *Indian Geography: Perspectives, Concerns and Issues*, Rawat publications, Jaipur

Saraswathi Raju (2013), Gendered Geographies: Space and Place in South Asia, Sage Publications

Satish Kumar (2006) Colonial and post colonial Geographies of India, Sage Publications

Hill, Michael R. (1981). Positivism: a hidden philosophy in geography. In Milton Harvey & Brian P. Holly (eds.), Themes in Geographic Thought. St. Martin's Press. pp. 38--60.

Sayer, A. (1992). Radical geography and Marxist political economy: towards a re-evaluation. Progress in Human Geography, 16(3), 343–360.
<https://doi.org/10.1177/030913259201600302>

Teaching Learning Strategies

- Assignments, Internal Examinations, Seminars

Mode of Transaction

- Off-line Mode, Black Board and Chalk

ASSESSMENT RUBRICS

	Marks
End Semester Evaluation	60%
Continuous Evaluation	40%

Semester I	
Core Course	
Course Code: MSGGY01DSC02	Course Name: ADVANCED GEOMORPHOLOGY

Description of the Course:

The course Advanced Geomorphology mainly deals with scientific exploration of landforms, their origin and the processes that shape and reshape Earth's surface. It offers a comprehensive understanding of these natural features and dynamic forces that have shaped the planet over millions of years. By the end of the course students will gain insights into the principles, theories and methods used to analyse and interpret these natural features.

Course Objectives

- To examine the development of modern geomorphic thought and critical appreciation of fundamental concepts in Geomorphology.
- To understand the relationships that exists between the landforms and the earth processes.
- To analyse and appreciate the processes in Tropical geomorphology with special reference to coastal and fluvial systems.
- To analyse the scope and significance of applied geomorphology and its applicability in Engineering projects and managing disaster management

Credit			Teaching hours			Assessment		
L/T	P/I	Total	L/T	P/I	Total	CE	ESE	Total
4	--	4	72		72	60	40	100

L/T Lecture/Tutorials, P/I - Practical/Internship CE - Continuous Evaluation
ESE – End Semester Evaluation

COURSE OUTCOMES

Course Learning Outcomes: At the end of the course, the Student will be able to

CO1	Analyse the conceptual basis of Geomorphology and its evolutionary phases.
CO2	Understand the process that sculpts surface features.
CO3	Assess the magnitude of tropical processes in the development and alteration of landforms.
CO4	Critically analyse and interpret various approaches in landscape evolution.
CO5	Acquire problem solving skills in the way of application of geomorphological principles in various contexts.

COURSE CONTENTS

Module	Course Contents	No. of hours
1.0		18 hrs
1.1	Nature and development of geomorphology-Branches- approaches	
1.2	Fundamental concepts in geomorphology	
1.3	Geological time scale- Origin and evolution of earth crust-rocks and lithification, Landforms	
1.4	Geomorphic Processes-Plate tectonics-Sea floor spreading-vulcanicity and seismicity	

Suggested Readings Specific to the module

Arthur L. Bloom (2003) Geomorphology – A systematic Analysis of Late Cenozoic Landforms, Pearson Education, Singapore.

Arthur N Strahler and Alan H Strahler (1998) Modern Physical Geography, John Wiley and Sons, Inc

Thornbury W.D (1969) Principles of Geomorphology, Wiley Intl. Edn & Wiley Eastern Reprints 1984.

Bloom, A.L. (1991): Geomorphology, 2nd Ed Englewood Cliffs, M.J. Prentice Hall

Christopherson, R.W. (1995): Elemental Geosystems: A Foundation in Physical Geography, Prentice Hall Englewood Cliffs, New Jersey.

Richard John Haggett (2003) Fundamentals of Geomorphology, Rutledge, London

Module	Course Contents	No. of hours
2.0		18 hrs
2.1	Factors of Landform evolution- form and processes	
2.2	Evaluation of landforms development theories – Hutton, Davis, Penck, L C King, Hack, Denudation chronology- erosion Surfaces.	
2.3	Study of hill slopes form and processes	
2.4	Slope evolution models of Davis, W. Penck, L.C. King and A. Wood	

Suggested Readings Specific to the module

Arthur N Strahler and Alan H Strahler (1998) Modern Physical Geography, John Wiley and Sons, Inc

Leopold, L.B. Wolman, M.G. & Miller, J.P. (1964): Fluvial Processes in Geomorphology, W.H. Freeman, San Francisco

Richard John Haggett (2003) Fundamentals of Geomorphology, Routledge, London

Arthur L. Bloom (2003) Geomorphology – A systematic Analysis of Late Cenozoic Landforms, Pearson Education, Singapore

Christopherson, R.W. (1995): Elemental Geosystems: A Foundation in Physical Geography, Prentice Hall Englewood Cliffs, New Jersey

Module	Course Contents	No. of hours
3.0		18 hrs
3.1	Weathering and mass wasting-	
3.2	Pedogenesis and Soil characteristics, soil processes.	
3.3	Fluvial processes and river valley development- channel Dynamics and morphology	
3.4	Coastal Morphodynamics: Quantification and Interpretation of Coastal features and Processes	

Suggested Readings Specific to the module

Robinson, Harry (1969): Morphology and Landscape, University Tutorial Press Ltd. London

Richard John Haggett (2003) Fundamentals of Geomorphology, Routledge, London

Morgan, R.S. & Wooldridge S.W (1959): Outline of Geomorphology the Physical basis of Geography, Longmans Green, London

Briggs, K. (1985): Physical Geography Process and System, Hodder and Stoughton, London

Chorley, R.J. Schumm, S.A. & Sugden, D.E. (1985): Geomorphology, Methuen & Co. Ltd., London, New York.

Darrel Hess (2012), MCKNIGHT'S Physical Geography -A Landscape Appreciation, PHI Learning Private Limited, New Delhi.

Module	Course Contents	No. of hours
4.0		18 hrs
4.1	Regional geomorphology- terrain analysis and modelling	
4.2	Climatic geomorphology and Morphogenetic regions	
4.3	Trends in applied Geomorphology.	
4.4	Geo-informatics and Geomorphology	

Suggested Readings Specific to the module

Cook, R.U. & Doornkamp, J.C. (1974): Geomorphology in Environmental Management, an Introduction. Clarendon Press. Oxford

Richard John Haggett (2003) Fundamentals of Geomorphology, Routledge, London

Morgan, R.S. & Wooldridge S.W (1959): Outline of Geomorphology the Physical basis of Geography, Longmans Green, London

Briggs, K. (1985): Physical Geography Process and System, Hodder and Stoughton, London

Hart, M.G. (1986): Geomorphology Pure and Applied, George Allen and Unwin, London

Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam

Core Compulsory Readings (*Books, Journals, E-sources Websites/weblinks*)

- Arthur L. Bloom (2003) *Geomorphology – A systematic Analysis of Late Cenozoic Landforms*, Pearson Education, Singapore
- Arthur N Strahler and Alan H Strahler (1998) *Modern Physical Geography*, John Wiley and Sons, Inc
- Bloom, A.L. (1991): *Geomorphology*, 2nd Ed Englewood Cliffs, M.J. Prentice Hall
- Chorley, R.J. Schumm, S.A. & Sugden, D.E. (1985): *Geomorphology*, Methuen & Co. Ltd., London, New York
- Thornbury W.D (1969) *Principles of Geomorphology*, Wiley Intl. Edn & Wiley Eastern Reprints 1984.
- Christopherson, R.W. (1995): *Elemental Geosystems: A Foundation in Physical Geography*, Prentice Hall Englewood Cliffs, New Jersey
- Cook, R.U. & Doornkamp, J.C. (1974): *Geomorphology in Environmental Management, an Introduction*. Clarendon Press. Oxford
- Hart, M.G. (1986): *Geomorphology Pure and Applied*, George Allen and Unwin, London.
- Richard John Haggett (2003) *Fundamentals of Geomorphology*, Routledge, London
- Strahler, A.N (1992): *Physical Geography*. John Wiley & Sons Inc., New York
- Verstappen H. (1983) *Applied Geomorphology, Geomorphological Surveys for Environmental Development*, Elsevier, Amsterdam
- Wooldridge S W and R. S. Morgan (2004)–*The Physical Basis of Geography - An Outline of Geomorphology*, Orient Longman Private Limited
- <https://doi.org/10.2307/2561059>
- <https://www.questjournals.org/jrees/papers/vol8-issue8/A08080110.pdf>
- <https://www.jstor.org/stable/30085042>
- <https://www.jstor.org/stable/2561059>

Core Suggested Readings (*Books, Journals, E-sources Websites/web links*)

- Brierley, G.J. & Fryirs, K.A. (2005): *Geomorphology and River Management*, Blackwell Publishing, Oxford UK
- Briggs, K. (1985): *Physical Geography Process and System*, Hodder and Stoughton, London
- Darrel Hess (2012), *MCKNIGHT'S Physical Geography -A Landscape Appreciation*, PHI Learning Private Limited, New Delhi
- Dayal P (1996) *A Textbook of Geomorphology*, Shukla Book Depot, Patna, India
- Fairbridge, R.W., ed. (1968): *Encyclopedia of Geomorphology* Reinhold, New York
- John P Miller and Luna Bergere Leopold, *Fluvial Processes in Geomorphology*
- Kale V S and Gupta A (2010) *Introduction to Geomorphology*, Orient Longman, Calcutta
- Leopold, L.B. Wolman, M.G. & Miller, J.P.(1964): *Fluvial Processes in Geomorphology*, W.H.Freeman, San Fransisco

Robinson, Harry (1969): Morphology and Landscape, University Tutorial Press Ltd. London

Spark, B. W. (1986): Geomorphology, Longman, London

Thomas, M.F. (1974): Tropical Geomorphology, Macmillan, London

Wadia, D.N. (1993): Geology of India, Tata McGraw Hill Edition, New Delhi

<https://www.iasj.net/iasj/download/1309ece36042e463>

Teaching Learning Strategies

- Assignments, Internal Examinations, Seminars

Mode of Transaction

- Off-line Mode, Black Board and Chalk

Assessment Rubrics

	Marks
End Semester Evaluation	60%
Continuous Evaluation	40%

Semester I	
Core Course	
Course Code: MSGGY01DSC03	Course Name: APPLIED CLIMATOLOGY & OCEANOGRAPHY

Description of the course:

The course on Climatology and Oceanography offers a comprehensive exploration of Earth's atmospheric and oceanic systems, focusing on their dynamic interactions and influence on the global climate. The syllabus encompasses a broad range of topics, including atmospheric circulation patterns, climate zones, ocean currents, El Niño and La Niña phenomena, climate change, and the impact of human activities on the environment. Through a combination of theoretical lectures, practical lab sessions, and fieldwork, students gain a deep understanding of climate processes, ocean dynamics, and their intricate relationship with the Earth's ecosystems. Moreover, the course equips students with essential analytical and research skills, enabling them to assess climate data, develop climate models, and propose effective strategies for climate adaptation and mitigation.

Course Objectives

- To gain advanced knowledge about the climatic processes, their types and distribution
- To learn the ensuing climate changes, their magnitude, causes and strategies which can be adopted for the mitigation of climate change.
- To gain advanced knowledge about ocean circulation and the salinity temperature variations in oceans of the world
- To examine the relevance of ocean resources and laws concerning them

Credit			Teaching hours			Assessment		
L/T	P/I	Total	L/T	P/I	Total	CE	ESE	Total
4	--	4	72		72	60	40	100

L/T Lecture/Tutorials, P/I - Practical/Internship CE - Continuous Evaluation
ESE – End Semester Evaluation

COURSE OUTCOMES

Course Learning Outcomes: At the end of the course, the Student will be able to

CO1	Understand the mechanism of climatic phenomena.
CO2	Understand the extreme weather phenomena, their occurrence, and its impact.
CO3	Classification of climate & analysis of climatic data, their interpretation, modeling, and weather forecasts.

CO4	Understanding ocean relief features along with ocean circulations and physiochemical characteristics
CO5	To develop a solid idea about ocean resources and laws concerning oceans

COURSE CONTENTS

Module	Course Contents	No. of hours
1.0		18 hrs
1.1	Scope and Content of Climatology; Elements and controls of climate	
1.2	Atmospheric motion- Atmospheric pressure and circulation, Air Masses – Source Regions, Characteristics	
1.3	Fronts - Polar Front Theory, Polar vertex	
1.4	Monsoons – Theories on the formation of monsoons; Regional aspects of Indian Monsoon – Monsoon Trough, Jet stream, Tibetan High; El Nino–La Nina, Indian ocean dipole	

Suggested Readings Specific to the module

Critchfield, Howard J (2008): General Climatology, Prentice Hall, London
Barry, R.G., and Chorley, R.J. (2010): Atmosphere, Weather and Climate, Routledge, London
Das P. K. (1995): The Monsoon, Prayag Pustak Bhavan, Allahabad, National Book Trust, India
Khullar, D.R (2018): India- A comprehensive geography, Kalyani Publishers, Noida
Lal D S (2003) Climatology, Sharda Pustak Bhavan, Allahabad.

Module	Course Contents	No. of hours
2.0		18 hrs
2.1	Stability and Instability; Thunderstorms, Cloud Bursts, Squalls, formations of Tornadoes	
2.2	Downburst, Flash flood and Derecho	
2.3	Tropical Cyclones – Recent tropical cyclones, Extra-Tropical Cyclones	
2.4	Dust Storm, Hail Storms, Blizzards, Heat and cold Waves.	

Suggested Readings Specific to the module

Burt, Christopher C (2004): Extreme Weather – A Guide and Record Book, W.W Norton and Company, New York
<https://www.weather.gov/lmk/derecho> - NOAA page on Derecho storms
Vijayakumar, K. (2005): Cyclone Devastations – its implications, Serials Publications, New Delhi
Oliver, John E & Hidore, John J (2001): Climatology- An atmospheric science, Pearson Education
Singh, Savindra (2020): Climatology, Pravallika publications, Allahabad
<https://www.egyankosh.ac.in/bitstream/123456789/25165/1/Unit-17.pdf> - IGNOU material on heat waves and cold waves

Module	Course Contents	No. of hours
3.0		18 hrs
3.1	Climatic classifications of Koeppen, Trewartha, and Thornthwaite	
3.2	Major Climates of the World: Tropical Rain Forest, Mediterranean, Tropical Deserts and Tundra Climates	
3.3	Applied climatology, Weather forecasts - Collection and analysis of climatic data, their interpretation, Forecasting, and tracking of Extreme Weather Phenomenon, Weather industry	
3.4	Climate Change, International Climate Change Agreements, Organizations and Local Governance	

Suggested Readings Specific to the module

Sidhartha, K (2016): Atmosphere, Weather and Climate, Kisalaya Publications Private Limited, Delhi

Lal D S (2003): Climatology, Sharda Pustak Bhavan, Allahabad.

Gilbert Loren, (2019): Concepts and Applications of Climatology, Syrawood Publishing House.

Trewartha, G.T (1968): An Introduction to Climate, McGraw Hill Book Co. New York.

Thompson & Perry (1997): Applied Climatology- Principles and practice, Routledge, New York

Dubash, Navroz, K (2012): Handbook of Climate Change and India, Oxford Press, New Delhi

Module	Course Contents	No. of hours
4.0	Oceanography	18 hrs
4.1	Classification, characteristics, and origin of the major structural and morphological features of the ocean floor (Pacific, Atlantic, Indian, and Arctic)- Plate tectonics and ocean floor	
4.2	Temperature, salinity, and density and their distributions in Pacific, Atlantic, Indian and Arctic Oceans	
4.3	Ocean circulation: classification and significance- Ocean currents, upwellings, and downwelling, thermohaline circulations, Ocean extremes- Tsunami	
4.4	Ocean resources and international cooperation- Physical and biological resources, marine energy, international laws of the sea, and the United Nations Convention on laws of the sea.	

Suggested Readings Specific to the module

Stewart, Robert H (2004): *Introduction to physical Oceanography*, Orange Grove books,

Singh, Savindra (2001): *Oceanography*, Pravallika publications, Allahabad

Sidhartha, K (2014): *Oceanography- A brief introduction*, Kisalaya Publications Private Limited, Delhi

Thurman, Harold V (2011): *Essentials of Oceanography*, Prentice Hall India, New Delhi

Core Compulsory Readings (Books, Journals, E-sources Websites/weblinks)

Critchfield, Howard J (2008): *General Climatology*, Prentice Hall, London

Barry, R.G., and Chorley, R.J. (2010): *Atmosphere, Weather and Climate*, Routledge, London

Oliver, John E & Hidore, John J (2001): *Climatology- An atmospheric science*, Pearson Education

Singh, Savindra (2020): *Climatology*, Pravallika publications, Allahabad

Sidhartha, K (2016): *Atmosphere, Weather and Climate*, Kisalaya Publications Private Limited, Delhi

Lal D S (2003): *Climatology*, Sharda Pustak Bhavan, Allahabad.

Sidhartha, K (2014): *Oceanography- A brief introduction*, Kisalaya Publications Private Limited, Delhi

Thurman, Harold V (2011): *Essentials of Oceanography*, Prentice Hall India, New Delhi

Core Suggested Readings (Books, Journals, E-sources Websites/weblinks)

Negi, B.S (2000): *Climatology and Oceanography*, Kedar Nath ram Nath publishers, Meerut

Mayes and Hughes (2004): *Understanding weather- a visual approach*, Arnold publishers

Lutgens, Frederick K et.al (2018): *The Atmosphere- An Introduction to Meteorology*, Prentice Hall India, New Delhi

<https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-currents>

<https://worldoceanreview.com/en/wor-1/climate-system/great-ocean-currents/>

Teaching Learning Strategies

- Assignments, Internal Examinations, Seminars

Mode of Transaction

- Off-line Mode, Black Board and Chalk

Assessment Rubrics

	Marks
End Semester Evaluation	60%
Continuous Evaluation	40%

Semester I	
Core Course	
<p>Course Code: MSGGY01DSC04</p>	<p>Course Name: FUNDAMENTALS OF GEOGRAPHIC INFORMATION SYSTEM</p>

Description of the course:

Geoinformatics is an interdisciplinary course that explores the fusion of geographic information science and technology to analyze, interpret, and visualize spatial data. Throughout the course, students delve into various topics such as remote sensing, geographic information systems (GIS), cartography, and spatial analysis, learning how to harness these tools to solve real-world problems related to urban planning, environmental management, natural resource exploration, disaster response, and more. By mastering geospatial data collection techniques and applying advanced computational methods, students develop a comprehensive understanding of geoinformatics and its vital role in shaping sustainable and data-driven decisions in an increasingly interconnected and dynamic world.

Course Objectives

- To understand the basic concepts of Geographical Information Systems
- To familiarize with the potential of GIS for modeling the real world.
- To understand various applications of GIS for the conservation and management of natural and material resource
- To analyze the recent trends in GIS

Credit			Teaching hours			Assessment		
L/T	P/I	Total	L/T	P/I	Total	CE	ESE	Total
4	--	4	72		72	60	40	100

L/T Lecture/Tutorials, P/I - Practical/Internship CE - Continuous Evaluation
ESE – End Semester Evaluation

COURSE OUTCOMES

Course Learning Outcomes: At the end of the course, the Student will be able to

CO1	To understand the basic concepts of Geographical Information Systems
CO2	To familiarize with the potentials of GIS for modeling the real world
CO3	To understand various applications of GIS for the conservation and management of natural and material resource
CO4	To analyze recent trends in GIS

COURSE CONTENTS

Module	Course Contents	No. of hours
1.0	Fundamentals of GIS	18 hrs
1.1	Evolution of advanced cartography and GIS– components of GIS - Information Systems, Modeling Real World Features	
1.2	Data and its treatment- Data Formats, Database Management, Compression Techniques	
1.3	GIS Software- Principle functions in GIS, Standard Packages, Open-source GIS	
1.4	Recent trends in GIS- Web GIS and Web mapping: Geographic Markup Language - commercial web mapping programs	

Suggested Readings Specific to the module

M. Anji Reddy (2008) Textbook of Remote sensing and Geographical information systems, BS Publications, Hyderabad

Ian Heywood et.al (2002) An Introduction to Geographical Information System, Pearson Education Private Limited, Delhi.

Basudeb Bhatta (2011) Remote sensing and GIS, Oxford University Press, New Delhi

Bert Veenendaal et.al (2011) Advances in Web-based GIS, Mapping Services and Applications, CRC Press, Florida, USA

Module	Course Contents	No. of hours
2.0	Data in GIS	18 hrs
2.1	Geospatial data- Geodetic datum, spatial data models, Layer concept of GIS	
2.2	Errors in GIS data and its types, Data precision and data organization; Ethics of using GIS data	
2.3	Metadata, Standards, and Significance GIS	
2.4	Data Catalogues – Indian standards, NSDI metadata standards, data model in GIS	

Suggested Readings Specific to the module

Kang Tsung Chang (2008) *Introduction to Geographic Information Systems*, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.

M. Anji Reddy (2008) *Textbook of Remote sensing and Geographical information systems*, BS Publications, Hyderabad

IGNOU course material on GIS data quality, retrieved from: <https://egyankosh.ac.in/bitstream/123456789/39555/1/Unit-10.pdf>

Basudeb Bhatta (2021) *Remote sensing and GIS*, Oxford University Press, New Delhi
NSDI website page on standards, retrieved from: <http://www.nsdiclearinghouse.gov.in/erdas-apollo/nsdiportal/nsdistandards.html>

Module	Course Contents	No. of hours
3.0	Data in GIS	18 hrs
3.1	Georeferencing, Vectorization, Topological error correction	
3.2	Spatial Analysis and Modeling – Proximity Analysis, Overlay Analysis, Buffer Analysis, Network Analysis, Spatial Auto Correlation, Gravity Modeling	
3.3	DTM/DEM, Integration with Remote Sensing Data	
3.4	Thematic Mapping	

Suggested Readings Specific to the module

Chrisman N R (2001) *Exploring Geographic Information System*, Wiley

Michael N DeMers (2005) *Fundamentals of Geographic Information System*, John Wiley and Sons, New Delhi.

Basudeb Bhatta (2021) *Remote sensing and GIS*, Oxford University Press, New Delhi

R.P Misra (2014) *Fundamentals of Cartography*, Concept publishing company, New Delhi

Module	Course Contents	No. of hours
4.0		18 hrs
4.1	Applications in LU/LCC, Urban planning, Transport planning, Tourism	
4.2	Disaster management, defense, crime mapping	
4.3	Agriculture, natural resource management, meteorology, marine studies	
4.4	Planning social support systems, health care	

Suggested Readings Specific to the module

Burrough, P.A. (2005) *Principles of GIS for Land Resource Assessment*, Oxford Publications

Monika Kannan et.al (2020) *Geographical Information System and Crime Mapping*, CRC Press, Florida

Anil K Singh (2007) *Geoinformatics applications in Agriculture*, New India Publishing Agency, New Delhi

Aronoff S, (1989) *Geographic Information Systems: A Management Perspective*, WDL Publications

Core Compulsory Readings (Books, Journals, E-sources, Websites/weblinks)

- M. Anji Reddy (2008) Textbook of Remote sensing and Geographical information systems, BS Publications, Hyderabad*
- Basudeb Bhatta (2021) Remote sensing and GIS, Oxford University Press, New Delhi*
- Ian Heywood et.al (2002) An Introduction to Geographical Information System, Pearson Education Private Limited, Delhi.*
- Kang Tsung Chang (2008) Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.*
- Loo C P and Albert K W Y (2004) Concepts and Techniques of Geographic Information Systems, Prentice Hall of India, New Delhi.*
- Michael N DeMers (2005) Fundamentals of Geographic Information System, John Wiley and Sons, New Delhi.*
- Paul A Longley et.al (2001) Geographic Information System and Science, John Wiley and Sons, Chichester.*
- Star J and Estes (1989) Geographic Information Systems: An Introduction, Prentice Hall*
- Peter A Burrough et.al (2016) Principles of Geographical Information System, Oxford University Press, New York*
- <https://www.esri.com/en-us/what-is-gis/history-of-gis> - A Weblink on history and evolution of GIS

Core Suggested Readings (Books, Journals, E-sources, Websites/weblinks)

- ESRI material on Metadata and GIS, retrieved from:*
- <https://www.esri.com/content/dam/esrisites/sitecore-archive/Files/Pdfs/library/whitepapers/pdfs/metadata-and-gis.pdf>
- <https://downloads.esri.com/esripress/PDFs/The-ArcGIS-Book-second-edition.pdf> - ESRI Ebook on GIS
- Kvamme, K.L.: Recent directions and developments in geographical information systems. J Archaeol Res 7, 153–201 (1999).*
- D F Marble (1990): Introductory Readings In Geographic Information Systems, CRC Press, Bristol*
- Goodchild, M. F. (1991). Geographic information systems. Progress in Human Geography, 15(2), 194–200. <https://doi.org/10.1177/030913259101500205>*
- Michael F. Goodchild (2009) Geographic information systems and science: today and tomorrow, Annals of GIS, 15:1, 3-9, DOI: 10.1080/19475680903250715*

Teaching Learning Strategies

- Assignments, Internal Examinations, Seminars

Mode of Transaction

- Off-line Mode, Black Board and Chalk

Assessment Rubrics

	Marks
End Semester Evaluation	60%
Continuous Evaluation	40%

Semester I	
Core Course	
Course Code: MSGGY01DSC05	Course Name: Practical I ADVANCED CARTOGRAPHY

Description of the Course:

The course on Advanced Cartography offers a hands-on and immersive learning experience focused on mastering cutting-edge cartographic techniques and technologies. Through this practical syllabus, students will delve into the art and science of map design, exploring advanced principles of data visualization, thematic mapping, and geospatial analysis. The syllabus covers the latest software tools used in cartography, including GIS platforms.

Course Objectives

- To acquire understanding and hands-on training in advanced techniques in Cartography with special reference to GIS.
- Provide insight and practice to analyze climatic, geomorphic, and socio-economic data and interpret the result
- To familiarize the students with the techniques in geography for the analysis of the elements constituting the physical environment and to apply the knowledge in practice.

Credit			Teaching hours			Assessment		
L/T	P/I	Total	L/T	P/I	Total	CE	ESE	Total
4	--	4	72		72	60	40	100

L/T Lecture/Tutorials, P/I - Practical/Internship CE - Continuous Evaluation
ESE – End Semester Evaluation

COURSE OUTCOMES

Course Learning Outcomes: At the end of the course, the Student will be able to

CO1	Practice techniques to calculate the average slope and gradients of the earth's surface and interpret terrain
CO2	Acquire technical skills in the analysis of the morphological aspects of the drainage basin
CO3	Acquire skills in performing various spatial analyses in GIS
CO4	Analyse and interpret hydro-meteorological data for better water resource management.
CO5	Analysis of regional lithology, form, and processes

COURSE CONTENTS

Module	Course Contents	No. of hours
1.0		18 hrs
1.1	Toposheet and Open Series Maps	
1.2	Interpretation, Comparative Analysis at Different Scales, Slope and Distance Calculation,	
1.3	Thematic Mapping Techniques – Isopleth, Choropleth, Chorochromatic, Choroschematic,	
1.4	Projections – International Projection, Cylindrical, Conical, Zenithal (Polar Case) using G. Projector	

Suggested Readings Specific to the module

Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata.

Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan

R P Misra (2014) Fundamentals of Cartography, Concept Publishing Company, new Delhi

Grafarend and Krumm (2006) Map Projections, Springer, Germany

Module	Course Contents	No. of hours
2.0		18 hrs
2.1	QGIS based Georeferencing, Vectorization, Data Editing, Topological error correction	
2.2	Spatial Analysis and Modeling –Proximity Analysis, Overlay Analysis, Buffer Analysis, Network Analysis, Spatial Auto Correlation	
2.3	Gravity Modeling, DTM/DEM, Integration with Remote Sensing data	
2.4	Mapping Layout.	

Suggested Readings Specific to the module

Saha, Pijushkanti (2017) Advanced Practical Cartography, Books and Allied, Kolkata

Ian Heywood et.al (2002) An Introduction to Geographical Information System, Pearson Education Private Limited, Delhi.

Kang Tsung Chang (2008) Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.

https://docs.qgis.org/3.28/en/docs/user_manual/index.html- QGIS User Manual

Module	Course Contents	No. of hours
3.0		18 hrs
3.1	Terrain Profiling, Slope Analysis, Landscape Modeling	
3.2	Calculation of Average Slopes- Smith, Robinson and Went Worth	
3.3	Delineation of Watershed, Morphometric analysis –	
3.4	Linear, Aerial, Relief aspects, Calculation of area, stream ordering – Calculating Drainage Frequency	

Suggested Readings Specific to the module

Strahler, A. N. (1964): Quantitative Geomorphology of Drainage Basins and Channel Networks, In: Handbook of Applied Hydrology, Ven Te Chow, Ed., Section 4-II, McGraw-Hill Book Company, New York
Chorley, R.J. (ed.) 1972. Spatial Analysis in Geomorphology, Harper and Row.
Mayer, L. 1990. Introduction to Quantitative Geomorphology, Prentice Hall, New Jersey.

Module	Course Contents	No. of hours
4.0		18 hrs
4.1	Preparation of climatic maps- Isopleths, Isotherms, Isobars, Isohytes, Equipluves and Equi-Variable maps	
4.2	Graphs and Diagrams- Columnar, Linear, and Circular graphs – Frequency graphs – Trend graphs	
4.3	Open-Source Climatic Data Derivation.	
4.4	Cyclonic track analysis	

Suggested Readings Specific to the module

Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata.
Saha, Pijushkanti (2017) Advanced Practical Cartography, Books and Allied, Kolkata
Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan

Core Compulsory Readings (Books, Journals, E-sources Websites/we blinks)

Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata.
Saha, Pijushkanti (2017) Advanced Practical Cartography, Books and Allied, Kolkata
Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan
Singh RL and Rana B Singh (2004) Elements of Practical Geography, Kalyani Publishers, New Delhi

Core Suggested Readings (*Books, Journals, E-sources Websites/web links*)

Bangulia A M (2006) Practical Geography, Anmol Publishers Pvt. Ltd.
Chorley, R.J. (ed.) 1972. Spatial Analysis in Geomorphology, Harper and Row.
Doornkamp, J.C. and King, C.A.M. 1971. Numerical Analysis in Geomorphology: An Introduction, Arnold, London.
King, C. A. M. (1966): Techniques in Geomorphology, Edward Arnold Ltd., London
Monkhouse F J & Wilkinson H R (1973), Maps and Diagrams, Methuen & Co. Ltd. London
Morisawa, M. 1983. Geomorphological Laboratory Manual, John Wiley & Sons, New York.
Navarra, J. G. (1979): Atmosphere, Weather and Climate, W. B. Saunders Company, Philadelphia

Teaching Learning Strategies

- Assignments, Internal Examinations, Seminars

Mode of Transaction

- Off-line Mode, Black Board and Chalk

Assessment Rubrics

	Marks
End Semester Evaluation	60%
Continuous Evaluation	40%