CURRICULUM FOR
FOUR YEAR UNDERGRADUATE PROGRAMME OF
GEOGRAPHY

AS PER FRAMEWORK OF NEP-2020

Department of Geography
Nagaland University
2023

1. MINIMUMCREDITREQUIREMENTS TO AWARD DEGREEUNDER EACH CATEGORY

Sl. No.	Broad Category of Course	Minimum Credit Requirement	
		3-yearUG	4-yearUG
1	Major(Core)	60	80
2	MinorStream	24	32
3	Multidisciplinary Courses	09	09
4	Ability Enhancement Courses(AEC)	08	08
5	SkillEnhancement Courses(SEC)	09	09
6	ValueAdded CoursescommonforallUG	06-08	06-08
7	SummerInternship	02-04	02-04
8	ResearchProject/Dissertation	-	12
	TotalCredits	120	160

2.COURSESTRUCTUREFORCURRICULUMANDCREDITFRAMEWORKFOR UNDER GRADUATE PROGRAMME

SEMESTER-WISECOURSE ANDCREDITDISTRIBUTIONOF UNDER GRADUATE PROGRAMME

Semester	Course Categories	Credits	Remark
I	**2 Major Courses [C-1, C-2], (4 + 4)**	8	Core papers of one discipline will be the Minor papers of other discipline
	1 Minor Course (4)	4	
	1 Multidisciplinary Course	3	
	1 Ability Enhancement course (AEC)	2	
	1 Skill Enhancement Course (SEC), (3)	3	
	Total	**20**	
II	**2 Major Courses [C-3, C-4], (4+4)**	8	
	1 Minor Course (4)	4	
	1 Multidisciplinary Course	3	
	1 Ability Enhancement Course (AEC)	2	
	1 Common Value-Added Course	3	
	Total	**20**	
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.			
III	**2 Major Courses[C-5, C-6], (4+4)**	8	
	1 Minor Course	4	
	1 Multidisciplinary Course	3	
	1 Ability Enhancement Course (AEC)	2	
	1 Skill Enhance Course (SEC), (3)	3	
	Total	**20**	
IV	**2 Major Courses [C-7, C-8], (4+4)**	8	
	1 Minor Course	4	
	1 Ability Enhancement Course (AEC)	2	
	1 Skill Enhancement Course (SEC)	3	
	1 Common Value-Added Course	3	
	Total	**20**	

Students exiting the programme after securing 80 credits will be awarded UG Diploma in the relevant Discipline / Subject provided they secure additional 4 credits in skill based vocational courses offered during first year or second year summer term.			
Semester	**Course Categories**	**Credits**	**Remark**
V	**3 Major Courses [C-9, C-10, C-11], (4+4+4)**	12	
	1 Minor Course (4)	4	
	1 Internship	2	
	1 Common Value-Added Course	2	
	Total	**20**	
VI	**4 Major Courses [C-12, C-13, C-14, C-15], (4+4+4+4)**	16	
	1 Minor Course (4)	4	
	Total	**20**	
Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline / Subject upon securing 120 Credits.			
VII	**4 Major Courses[C-16, C-17, C-18, C-19],(4+4+4+4)**	16	
	1 Minor Course (5)	5	
	Total	**20**	
VIII	1 Minor Course*	4	*It will be finalized once UGC brings out the PG NEP guidelines
	3 Major Courses [C-20, C-21, C-22] * /Research Project	12	
	Total	**20**	
Students will be awarded UG Degree (Honours) with Research in the relevant Discipline /Subject provided they secure 160 credits.			

3. CREDITDISTRIBUTION

Science	**Remarks**	**Arts (Non- experimental)**	**Remarks**
TotalCredit 4	Theory3+Practical1	TotalCredit 4	Theory3+Tutorial1
TotalCredit 5	Theory3+Practical2	TotalCredit 5	Theory3+Tutorial2

GEOGRAPHY COURSE STRUCTURE: CORE PAPERS

Paper Code	Course Code	Title of the paper	Total Credit
FIRST SEMESTER			
C-1		Physical Geography	4
C-2		Human Geography	4
SECOND SEMESTER			
C-3		Geomorphology	4
C-4		Cartographic Techniques	4
THIRD SEMESTER			
C-5		Economic Geography	4
C-6		Geography of India	4
FOURTH SEMESTER			
C-7		Resource geography	4
C-8		Agricultural geography	4
FIFTH SEMESTER			
C- 9		Regional Planning and Development	4
C-10		Political Geography	4
C-11		Environmental Geography	4
SIXTH SEMESTER			
C-12		North east India with special focus on Nagaland	4
C-13		Climatology	4
C-14		Hydrology	4
C-15		Oceanography	4
SEVENTHSEMESTER			
C-16		Statistical methods in Geography	4
C-17		Urban Geography	4
C-18		Disaster management	4
C-19		Research Methodology (common for whole UG)	4
EIGHTH SEMESTER			
C-20	It may be planned once the UGC brings out P.G. NEP guidelines		4
C-21			4
C-22			4

Minor Courses (4 Credits each)

Semester	Course Code	Title of the Paper
I		M1-Biogeography
III		M3-Sustainable Resource development
V		M5-Rural Development
VII		M7- Climate Change Vulnerability and Adaptation

SkillEnhancement Courses (3 Credits Each)
(refer to common pool)

Semester	Course Code	Title of the Paper
FIRST	SEC S1	Thematic maps
THIRD	SEC S3	Remote Sensing
FOURTH	SEC S4	Geographical Information System

The Semester-wise and Broad Course Category-wise Distribution ofcredits of the Undergraduate Programme:

Semester	DisciplineSpecific Courses –Core	Minor	Interdisciplinary/ Multidisciplinary courses	AbilityEnhancement Courses(language)	SkillEnhancement Courses/Internship /Dissertation	Common Value-Added Courses	Total Credits
1	2	3	4	5	6	7	8
I	C1- Physical Geography C2 -Human Geography	M1-Biogeography	Environmental Science 3 credit	ENG-I (2 credit)	SEC S1 Thematic Maps (common pool)		20
II	C3 -Geomorphology C4 -Cartographic Techniques	M2	Common pool/Swayam 3 credit	MIL-I (2 credit)		Soft Skill 3 credit	20
	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.						*40*
III	C5 -Economic Geography C6 - Geography of India	M3-Sustainable Resource development	Understanding Heritage/ Common pool/ Swayam 3 Credit	ENG-2 (2 credit)	SEC S3 Remote Sensing (common pool)		20
IV	C7- Resource geography C8 -Agricultural geography	M4		MIL-2 (2 credit)	SEC S4 Geographical Information System (common pool)	NCC/NSS/CP (3 credit)	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.						*80*
V	C9 -Regional Planning and Development C10 -Political Geography C11- Environmental Geography	M5-Rural Development			(Internship) 2 credit	Work Ethics (2 credit)	20
VI	C12- North east India	M6					20

	with special focus on Nagaland C13-Climatology C14- Hydrology C15- Oceanography						
	Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline /Subject upon securing 120 credits						*120*
VII	C16- Statistical Method in Geography C17- Urban Geography C18-Disaster management C19- Research Methodology**	M7-Climate Change Vulnerability and Adaptation			Research dissertation will start		**20**
VIII	C20-*** C21-*** C22-***	**M8**			(Research Project/ Dissertation)		**20**
	Students will be awarded UG Degree (Honours) with Research in the relevant Discipline /Subject provided they secure 160 credits						*160*

****Paper is not included due to common structure.**

***** It may be planned once the UGC brings out P.G. NEP guidelines**

Core Courses

CourseName:PhysicalGeography
PaperCode:C1
TotalCredits:4

CourseObjectives

- ThispaperintroducesstudentstothefieldofPhysicalGeographyand itsspecificitiesinter-relationshipwithotherbranchesofPhysicalandSocialSciences
- It seeks to understand the Originof theEarth and thedynamicgeomorphicprocesses responsible for development of major landforms of varied types andnature.
- To make the students learn about the origin and types of rocks as well as soilformationandtypes.

Courseoutcomes

- Aftergainingknowledgebasedonthecontentsembodiedinthispaper,thestudentswill beabletorealizetheimportanceofthenatureandscopeofPhysicalGeography.
- Thepaperbeveryusefulfor studentspreparing forUGCNET-JRF/SLET examandothercompetitiveexamsincludingcivilservices

C-1: Theory **Credits3**

1. Physical geography- nature and scope: Branches of physical Geography: relationof Geography with physical Science(Geology, Meteorology & Hydrology) andSocialSciences(Economics,PoliticalScience,AnthropologyandHistory)
2. OriginofSolarSystemandearth(TidalHypothesisofJeansandJeffrey's,GaseousTheory byKant,NebularHypothesisofLaplaceandBigBangtheory)
3. Earth'sCrust(EndogeneticandExogeneticforces)
4. Majorlandforms(TypesandclassificationofMountains,PlateauandPlains)
5. Origin and types of rocks; Classification of igneous, sedimentary and Metamorphicrocks

C-1: Practical **Credit1**

1. Relief representation from the topographical sheet (V-shaped valley,U-shapedvalley,waterfall,cliff).
2. Construction of graphical scale (linear, diagonal and comparative), conversion ofmapscale.
3. PlaneTable/theodolite/GPSSurvey
4. Vivavoceandpracticalnotebook.

ReadingList:

1. Bryant,H.Richard(2001):PhysicalGeographyMadeSimple,RupaandCompany,NewDelhi.
2. Negi,B.S(2000):PhysicalGeography,KedarNathRamNath,Meerut
3. Singh,S.(2003):PhysicalGeography,PhysicalGeography,PrayagPustakBhawan,Allahabad.
4. Sharma,Y.K.(2007):PhysicalGeography,LakshmiNarainAgarwal,Agra
5. Thornbury,W.D.(1960):PrinciplesofGeomorphology,JohnWilleyandSons,NewYork.

CourseName:HumanGeography
PaperCode:C2
TotalCredits:4

Courseobjectives

- This paper is a core paper that intends to introduce students to human geographyandhowhumankindtransformsandgetstransformedbygeographicspace.
- It seeks to develop new insights among students on the relevance of human-environmentalrelationshipsandhowaspatialperspectiveshapestheserelationships.

Courseoutcomes

- Thepaperwillbeusefulforstudentsindevelopingideasonhuman-environmentissuesthatgeographersusuallyaddressintheanthropocene.
- ThepaperwillbeusefulforstudentspreparingforUGCNET/SLETexamsandothercompetitiveexamsincludingthecivilservice.

C-2: Theory **Credits3**

1. Meaning, nature and scope of Human Geography; Development and branches ofHumanGeography.
2. SpaceandSociety;Race;ReligionandLanguage.
3. Population:PopulationGrowthanddemographictransitiontheory;Factorsinfluencingdistributionofpopulation;densityofpopulation.
4. Migration: Factors influencing migration; types of migration; consequences ofmigration.
5. Settlements:Geographical factors influencinghuman settlement.Originandgrowth of Rural and Urban settlements. Rural Settlements: Types and pattern;UrbanSettlements:Morphologyandfunctionalclassification.

C-2: Practical **Credit1**

1. Representationofpopulationdatabypoint(DotandProportionateCircles).
2. Graphicalrepresentationandanalysis-Age-Sexpyramids.
3. Chain and tape Survey
4. Vivavoceandpracticalnotebook.

ReadingList

1. Chandna,R.C.(2010)PopulationGeography,KalyaniPublisher.
2. Hussain,Majid, N (2018) Human Geography, RawatPublications,Jaipur
3. Hassan,M.I.(2005)PopulationGeography,RawatPublications,Jaipur
4. Daniel,P.A.andHopkinson,M.F.(1989).TheGeographyofSettlement,Oliver&Boyd,London.
5. JohnstonR;GregoryD,PrattG.et.al.(2008).TheDictionaryofHumanGeography,Blackwell Publication.

Coursename: Geomorphology
Paper Code- C3
TotalCredit:4

Courseobjectives

- Toprovideageneralideaaboutthetopographicandsurficialcharacteristicsoftheearth'ssurfacetothestudents.
- Tomakethestudentsawareaboutthedynamicgeomorphicprocessesresponsiblefordevelopmentoflandformsofvariedtypesandnature.
- Toimpactappliedscientificknowledgeonlandformdevelopmentbasedongeomorphic concepts,principlesandtheories.

Courseoutcomes

- Thestudentswilllearnthattheearthisunstableanditisundergoingconstantchangesduetodynamicearth'sprocesses.
- Thestudentswill cometo know about themeaningand scopeofgeomorphology,whichamajorbranchofPhysicalGeography.
- Aftergainingknowledgebasedonthecontentsembodiedinthispaper,thestudentswillbeabletorealizetheimportanceofgeomorphological knowledgeasapplied in various developmental activities executed on the land and over theearth'ssurface.

C-3: Theory **Credits 3**

1. Geomorphology– Nature and scope; Development of Geomorphology-GeomorphologicalschoolinUSA,EuropeandIndia.
2. Earth'sinterior;Wegener'stheoryofContinentalDrift;PlateTectonics.
3. GeomorphicProcesses-Weathering,MassWasting;Drainagepatternsandtypes.
4. CycleofErosion(DavisandPenck)
5. EvolutionofLandforms(ErosionalandDepositional)-Fluvial,Karst,Aeolian,Glacial,andCoastal.

C-3 Practical **Credit 1**

1. InterpretationofTopographicalMaps.
2. Preparationofprofile(serial,superimposed,projectedandcomposite).
3. PreparationofSlopeMap/RelativeReliefMapusingWentworth'smethodandSmith'smethod.
4. Vivavoceandpracticalnotebook.

ReadingList

1. BloomA.L.,2003:Geomorphology:ASystematicAnalysisofLateCenozoicLandforms,Prentice-HallofIndia,NewDelhi.
2. BridgesE.M.,1990:WorldGeomorphology,CambridgeUniversityPress,Cambridge.
3. Christopherson,RobertW.,(2011),Geosystems:AnIntroductiontoPhysicalGeography,8Ed.,MacmillanPublishingCompany.
4. KaleV.S.andGuptaA.,2001:IntroductiontoGeomorphology,OrientLongman,Hyderabad.
5. KnightonA.D.,1984:FluvialFormsandProcesses,EdwardArnoldPublishers,London.
6. Selby,M.J.,(2005),Earth'sChangingSurface,IndianEdition,OUP
7. ThornburyW.D.,1968:PrinciplesofGeomorphology,Wiley.

CourseName: Cartographic Techniques
Paper Code:C4
TotalCredits:4

Courseobjectives

- Understandingtheimportanceofvariouscartographic techniquesin geographicalstudy.
- Generalunderstandingofmapscaleandmap content for topographical mapinterpretation.
- Acquaintance of different cartographic techniques for measurement andrepresentationofvariousfacetsoftopographyorterrainconditionofanyarea.

Courseoutcomes

• Understanding the importance of various cartographic techniques in geographical study.

• General understanding of map scale and map content for topographical map interpretation.

• Acquaintance of different cartographic techniques for measurement and representation of various facets of topography or terrain condition of any area.

C-4 TheoryCredits3

1. Cartography–Meaning,ScopeandBranchesofCartography.
2. Developmentofcartography-Ancientperiod,Medievalperiod,EarlyModernperiodandRecent period
3. MapScales–Concept,typesofscalesandtheirconversion;representationofpoint,lineandareainmaps.
4. StudyofTopographicalMaps:Topographicalmapcontentandnumberingsystem,generalinterpretationoftoposheetsinrespectofphysicalandculturaldetails.
5. Map Projections– Concept of Map Projection, Classification of Map Projectionsandbasicspropertiesanduses.

C-4Practical **Credit1**

1. Conversion ofmapscale.
2. Construction of graticules of Cylindrical Equal-area projection, Polar Orthographic projection along withtheirproperties,uses andlimitations.
3. Contouring by Theodolite or Dumpy Level.
4. Vivavoceandpracticalnotebook.

ReadingList

1. GuptaK.K.andTyagi,V.C.,1992:WorkingwithMap,SurveyofIndia,DST,NewDelhi.
2. MishraR.P.andRamesh,A.,1989:FundamentalsofCartography,Concept,NewDelhi.
3. RhindD.W.andTaylorD.R.F.,(eds.),1989:Cartography:Past,PresentandFuture,Elsevier,InternationalCartographic Association.
4. SinghR.L.andSinghR.P.B.,1999:ElementsofPracticalGeography,KalyaniPublishers.
5. Sarkar,A.(2015)Practicalgeography:AsystematicapproachOrientBlackSwan

Coursename:EconomicGeography
PaperCode-C5
TotalCredits:4

Courseobjectives

- Thispaperisacorepaperthatintendstointroducestudentstotheprinciplesofeconomicgeography
- Itseekstodevelopnewinsightsamongstudentsontherelevance ofeconomyandgeographyandassociatedproblemsincontemporarytimes.

Courseoutcomes

- The paper will be useful for students in developing ideas on how geographicalaspects organise economic space and will offer perspectives to students if theywishtopursuearesearchprogramme.
- ThepaperwillbeusefulforstudentspreparingforUGCNET/SLETexamsandothercompetitive examsincludingthecivilservices.

C-5 Theory **Credits3**

1. Introduction: Concept and classification of economic activity; Theories-Agriculture(VonThunentheory),Industry(Weber'stheory).
2. Primary Activities: Subsistence and Commercial agriculture, forestry, fishing andmining.
3. SecondaryActivities:Manufacturing (CottonTextile,IronandSteel),
4. TertiaryActivities:Transportandcommunication-air,waterandlandtransport,
5. BasesofInternationaltrade;majortradingblocs-EUandASEAN.

C-5 Practical **Credit 1**

1. Representation of economic data by graph (line, bar,).
2. Representation of economic data by statistical diagrams (pie and block pile diagram).
3. Representation of economic data by distribution maps (choropleth and dot method)
4. Vivavoceandpracticalnotebook.

ReadingList

1. AlexanderJ.W.,1963:EconomicGeography,Prentice-HallInc.,EnglewoodCliffs,NewJersey.
2. CoeN.M.,KellyP.F.andYeungH.W.,2007:EconomicGeography:AContemporaryIntroduction,Wiley-Blackwell.
3. HodderB.W.andLeeRoger,1974:EconomicGeography,TaylorandFrancis.
4. CombesP.,MayerT.andThisseJ.F.,2008:EconomicGeography:TheIntegrationofReginsandNations,PrincetonUniversityPress.
5. WheelerJ.O.,1998:EconomicGeography,Wiley.
6. DurandL.,1961:EconomicGeography,Crowell.
7. Bagchi-SenS.andSmithH.L.,2006:EconomicGeography:Past,PresentandFuture,TaylorandFrancis.
8. MahmoodA.,1977:StatisticalMethodsinGeographicalStudies,Concept.
9. PalS.K.,1998:StatisticsforGeoscientists,TataMcGrawHill,NewDelhi.

CourseName:GeographyofIndia

PaperCode: C6
TotalCredits:4

Course objectives

- Thispaperisacorepaperthatintendstointroducestudentstotheindiaasageographicalentity.
- Itseekstodevelopnewinsightsamongstudentsontherelevanceofgeographicalstudiesandindia'scontemporarygeographicalissues.

Courseoutcomes

- Thepaperwillbeusefulforstudentsindevelopingperspectivesonindiangeographyanditssystematicstudy.
- ThepaperwillbeusefulforstudentspreparingforUGCNET/SLETexamsandothercompetitive examsincludingthecivilservices

C-6: Theory **Credits3**

a. Physical:PhysiographicDivisions,soilandvegetation,climate
b. Population:Factorsinfluencingspatialdistribution;densityandgrowth.
c. Social:Distributionofpopulationbyreligionandlanguage.
d. Economic:Mineralandpowerresources-distributionandutilizationofironore,coal,petroleum;Agricultural-productionanddistributionofriceandwheat.
e. Transport:Roads,railwaysandairtransport.

C-6 Practical **Credits1**

1. Monthlytemperatureandrainfallgraphsoffiveselectedstationsfromdifferentphysiographicregionsofindia.
2. Representationofgeographicaldatausingergograph.
3. Representationofpopulationdatausingagesexpyramid.
4. Vivavoceandpracticalnotebook.

ReadingList

1. DeshpandeC.D.,1992:India:ARegionalInterpretation,ICSSR,NewDelhi.
2. Johnson,B.L.C.,ed.2001.GeographicalDictionaryofIndia.VisionBooks,NewDelhi.
3. SdyasukGalinaandP.Sengupta(1967):EconomicRegionalisationofIndia,CensusofIndia
4. Sharma,T.C.2003:India-EconomicandCommercialGeography.VikasPubl.,NewDelhi.
5. SinghR.L.,1971:India:ARegionalGeography,NationalGeographicalSocietyofIndia.
6. Tirtha,Ranjit2002:GeographyofIndia,RawatPubls.,Jaipur&NewDelhi.
7. Tiwari,R.C.(2007)GeographyofIndia.PrayagPustakBhawan,Allahabad
8. Sharma,T.C.(2013)EconomicGeographyofIndia.RawatPublication,Jaipur

CourseName:ResourceGeography

PaperCode:C7
TotalCredits:4

Courseobjectives

- This theory course basically deals with concept of resource and its classification,and the distribution, utilization and management of land, water, forest and energyresources.
- It also focuses on the natural resource base and its problems of conservation andmanagement.
- Italsoprovidesbasicideaaboutsustainabledevelopmentofresources.

Courseoutcomes

- Understandingthebasicconceptofresourceanditsvarioustypesandtheirutilities
- Acquiringbasicinformationaboutpotentialsandmanagementofresourceslikeland, water,forestandpoweringlobalcontext.
- Understandingtheprevailingnaturalresourcepotentialsandproblemsofmanagement.

C-7: Theory **Credits3**

1. Definition,NatureandScopeofResourceGeography:Typesofresources
2. Distribution,Utilization, ProblemsandManagementofMineralResources(Coal,Petroleum)andWaterResources.
3. Distribution,Utilization,ProblemsandManagementofForestsandEnergyResources
4. IssuesRelatedtoHumanresources:SocialandDemographicissues;Carryingcapacityoftheland.
5. ConservationofnaturalresourcesandSustainableResourceDevelopment

C-7: Practical **Credits1**

1. Satellite imagery interpretation- Forest cover, Water bodies.
2. Satellite imagery interpretation- Settlements.
3. RepresentationofHumanDevelopmentIndexinIndiausingchoroplethmethod.
4. Vivavoceandpracticalnotebook.

ReadingList

1. Cutter S.N.,RenwichH. L. and Renwick W., 1991: Exploitation,Conservation,Preservation: A GeographicalPerspectiveon Natural Resources Use, John WileyandSons,NewYork.
2. Gadgil M. and Guha R., 2005: The Use and Abuse of Nature: Incorporating ThisFissured Land: An Ecological History of India and Ecology and Equity, OxfordUniversityPress.USA.
3. Jones G. and Hollier G., 1997: Resources, Society and Environmental Management,PaulChapman,London.
4. KleeG.,1991:ConservationofNaturalResources,PrenticeHall,Englewood.
5. Mather A. S. and Chapman K., 1995: Environmental Resources, John Wiley and Sons,NewYork.

CourseName:AgriculturalGeography
PaperCode:C8
TotalCredits:4

Courseobjectives

- Thispaperintroducesstudentstothefieldofagriculturalgeographyanditsspecificities
- Itseekstodevelopnewinsightsamongstudentsontherelevanceofagricultureandallied activities shape the economy and geography of an area, region, country ortheglobe.

Courseoutcomes

- Thepaperwillbe useful for students in developing ideas on howgeographicalfactorstangentonagriculturalactivitiesandhowgeographersseektoaddressissuesofagriculturaldevelopmentandagriculturaldisparities.
- Itwillbuildskillsforstudentsseekingtoenrolinaresearchprogrammeand/orprovideopeningsforthemwithagricultural/ruralplanningagencies

C-8: Theory **Credits3**

1. Introduction,natureandscope;definitionandclassificationoflanduse/landcover.
2. DeterminantsofAgriculture:Physical,TechnologicalandInstitutional.
3. Agricultural Regions of India: Agro-climatic, Agro-ecological & CropCombinationRegions.
4. AgriculturalSystemsoftheWorld(Whittlesey'sclassification)andAgriculturalLanduse model(VonThunen,modificationandrelevance).
5. AgriculturalRevolutionsinIndia:Green,White,Blue,Pink

C-8: Practical **Credits1**

1. PreparationandinterpretationofcropcalendarusingErgograph.
2. SpatialvariationsinNorthEastIndiawithPiediagram.
3. MappingofspatialpatternofIntensityofCroppinginNorthEastIndia.
4. Vivavoceandpracticalnotebook

ReadingList

1. Basu,D.N.,andGuha,G.S.,1996:Agro-ClimaticRegionalPlanninginIndia,Vol.I&II,ConceptPublication,NewDelhi.
2. Bryant,C.R.,Johnston,T.R,1992:AgricultureintheCityCountryside,BelhavenPress,London.
3. Burger,A.,1994:AgricultureoftheWorld,Aldershot,Avebury.
4. IlberyB.W.,1985:AgriculturalGeography: ASocialandEconomicAnalysis,OxfordUniversity Press.
5. Shafi,M.,2006:AgriculturalGeography,DoringKindersleyIndiaPvt.Ltd.,NewDelhi

CourseName: Regional Planning and Development

PaperCode: C9

TotalCredits:4

Courseobjectives

• This paper intends to introduce students to the rationale underlying the relevance of balanced regional development and spatial inequalities in geography

• It seeks to develop new insights among students on the issue of development and disparities among geographical regions

Courseoutcomes

• The paper will be useful for students in developing ideas on disparities within and between countries and their fallout.

• The paper will help provide theoretical insights and perspectives to students if they wish to pursue a research program in future.

• The paper will be very useful for students preparing for UGC NET-JRF / SLET exam and other competitive exams including civil services

C-9: Theory **Credits3**

1. Region: Concept, types and delineation of planning region.
2. Regional planning: Evolution and types; Objectives and principles of Regional Planning.
3. Regional Planning in India: Macro, meso and micro level planning; Local level planning and Panchayati Raj (GPDP); Participatory approach in planning; NITI Aayog.
4. Concept of Development and Regional Disparity, Concept of sustainable development, Measuring development: Indicators (Economic, Social and Environmental); Human development.
5. Planning regions of India with special reference to North-East India

C-9: Practical **Credit1**

1. Preparation of flow cartogram to show volume of inter-state movement of different commodities in India/NE India.
2. Thematic maps- Delineation of functional regions.
3. 3. Viva voce and practical note book

ReadingList

1. Blij H. J. De, 1971: Geography: Regions and Concepts, John Wiley and Sons.
2. ClavalP.l, 1998: An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
3. Friedmann J. and Alonso W. (1975): Regional Policy- Readings in Theory and Applications, MIT Press, Massachusetts.
4. Gore C. G., 1984: Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
5. Gore C. G., Köhler G., Reich U-P. and Ziesemer, T., 1996: Questioning Development; Essays on the Theory, Policies and Practice of Development Intervention, Metropolis-Verlag, Marburg.

CourseName:PoliticalGeography

PaperCode:C10
TotalCredits:4

Courseobjectives

- Thispaperseekstointroducestudentstothegeographicalaspectsbehindpoliticalphenomena
- It seekstodevelopnew insightsamong studentson therelevanceofpoliticalgeographicalstudiesinachangingglobalscenario.

Courseoutcomes

- Thepaperremainsusefulforstudentsindevelopingideasongeopoliticsandalliedphenomenaandwillaidstudentsthatmaypursuearesearchprogrammes.
- ThepaperwillbeusefulforstudentspreparingforUGCNET/SLETexamsandothercompetitive examsincludingthecivilservices.

C-10: Theory **Credits3**

1. Introduction:Concepts,NatureandScope.
2. ConceptofNationandState;AttributesofState– Shape,Size,TerritoryandSovereignty;FrontiersandBoundaries;
3. DevelopmentofGeopolitics,ConceptofOrganicstate;Globalstrategicmodels(Heartland andMahan'sSeapowerconcept)
4. ElectoralGeography– GeographyofVoting,GeographicInfluencesonvotingpattern,GeographyofRepresentation,Gerrymandering.
5. PoliticsofDisplacement;Issuesofrelief,compensationandrehabilitationwithreferencetoDams.

C-10: Practical **Credit1**

1. Assess voting pattern of Nagaland (at least two terms) using graphical/ sphere method
2. Preparationof comparative map to show the spatialdistributionof religion/ gender inIndia.
3. Enlargement and Reduction of Maps by graphical method.
4. Vivavoceandpracticalnotebook.

ReadingList

1. AgnewJ.,2002:MakingPoliticalGeography,Arnold.
2. Agnew J., Mitchell K. and ToalG.,2003:ACompaniontoPoliticalGeography,Blackwell.
3. CoxK.R.,LowM.andRobinsonJ.,2008:TheSageHandbookofPoliticalGeography,SagePublications
4. GallaherC.,etal,2009:KeyConceptsinPoliticalGeography,SagePublications.
5. MathurHMandMMCernea(eds.)Development,DisplacementandResettlement – FocusonAsianExperience,Vikas,Delhi
6. TaylorP.andFlintC.,2000:PoliticalGeography,PearsonEducation.
7. Verma M K (2004): Development,DisplacementandResettlement,RawatPublications,Delhi

CourseName:EnvironmentalGeography

PaperCode: C11
TotalCredits:4

Course objectives

- Thispaperintendstointroducestudentstogeographyandenvironmentinterface.
- Itseekstodevelopnewinsightsamongstudentsontherelevanceofenvironmentalstudies fromaspatialperspective.
- Thepaperwillenablethestudentstounderstandthevariousfacetsofenvironment,itsdegradationaswellasmanagement.
- ToprovideunderstandingandawarenessofEnvironmentalissuesatGlobalandregional level

Courseoutcomes

- The paper will be useful for students in developing ideas on environmental issuesthatgeographersusuallyaddress.
- ThepaperwillbeusefulforstudentspreparingforUGCNET/SLETexamsandother competitive examsincludingthecivilservices.

C-11: Theory **Credits3**

1. EnvironmentalGeography–Concept,ScopeandSignificance
2. Human-EnvironmentRelationships–HistoricalProgression,AdaptationindifferentBiomes.
3. Eco-system:concept,typesandcomponents,structureandfunctions;Ecology–Concept andprinciples.
4. MajorGlobalEnvironmentalProblems:Pollution,Deforestation,Desertification,GlobalWarming,Bio-Depletion
5. EnvironmentalProgrammesandPolicies–Global,NationalandLocal

C-11: Practical **Credit1**

1. Qualityassessmentofsoil(OrganicmatterandNPK)orwater(pHandTotalDissolvedSolids)usingfieldkit.

(OR)

2. ProjectonenvironmentalproblemsofNorthEastIndia (select anyone state).

ReadingList

1. Chandna,R.C.,2002:EnvironmentalGeography,Kalyani,Ludhiana.
2. Singh,R.B.(Eds.)(2009)BiogeographyandBiodiversity.RawatPublication,Jaipur
3. MoEF, 2006: National Environmental Policy-2006, Ministry of Environment andForests,GovernmentofIndia.
4. Odum,E.P.etal,2005:FundamentalsofEcology,CeneageLearningIndia.
5. SinghS.,1997:EnvironmentalGeography,PrayagPustakBhawan.Allahabad.
6. Singh,M.,Singh,R.B.andHassan,M.I.(Eds.)(2014)Climatechangeandbiodiversity:ProceedingsofIGURohtakConference,Volume1.AdvancesinGeographicalandEnvironmentalStudies,Springer

CourseName:NorthEastIndiawithSpecialFocusonNagaland

PaperCode: C12
TotalCredits:4

Courseobjectives

- ThispaperthatintendstointroducestudentstoNorthEastIndiaasageographicalentity.
- TounderstandthegeographicalsettingofNorthEastIndiaandNagalandandtoanalyzethe regionspotentiallyforsustainabledevelopment

Courseoutcomes

- ThepaperwillbeusefulforstudentsindevelopingperspectivesongeographyofNorthEast Indiaanditssystematicstudy.
- ThepaperwillbeusefulforstudentspreparingforUGCNET/SLETexamsandothercompe titive examsincludingthecivilservices.

C-12:Theory **Credits3**

1. NorthEastIndia:Physicalcharacteristics:Physiography,Drainage,Climate,SoilandNatu ral vegetation
2. PopulationofNorthEastIndia:Growth,DistributionandDensity,Age-SexComposition,Rural-UrbanComposition
3. Economy-Classificationandtypes,ProblemsandProspects(Agriculture,Industries,transpo rtandCommunication)
4. Nagaland:PhysiographyandNaturalVegetation;Biodiversityandits conservationissues.
5. Nagaland:Demographiccharacteristics-PopulationGrowth,DistributionandDensity,AgeSexComposition.

C-12:Practical **Credits1**

1. TrendofpopulationgrowthandgrowthratesinN.E.India/Nagalandsince1901usingCens usof Indiadata
2. ChoroplethmappingtoshowdensityofpopulationinNagaland.
3. TypesofCartograms-IsochronicandTrafficflow.
4. Vivavoceandpracticalnotebook.

ReadingList

1. Taher,M.andAhmed,P.(RevisedEdition,2014):GeographyofNorthEastIndia,ManiManik Prakash,Guwahati
2. Bhattacharyya, N.N. (2005): North East India: A Systematic Geography, Rajesh Pub.NewDelhi.
3. GopalKrishnan,R.GeographyofNorthEastIndia.
4. GopalKrishnan,R.(1991):NorthEastIndia:Land,PeopleandEconomy,VikashPublishingH ouse,NewDelhi.
5. Sebu,Sonyhulo(2013):GeographyofNagaland,SpectrumPublicationsGuwahati,Delhi.
6. Singh,S.(1994):AgriculturalDevelopmentinNorthEastIndia:ARegionalAnalysis,Kaushal Publications,Shillong.

Course Name: Climatology
PaperCode:C13
TotalCredits:4

LearningOutcomes

- Thispaperintendstointroducestudentstotherationaleunderlyingclimatologicalstudiesi n geography
- Itseekstodevelopnewinsightsamongstudentsontherelevanceofclimaticvariablestrengt heningonclimatechange.

Course outcome

- Thepaperwillbeusefulforstudentsindevelopingideasonclimaterelatedaspectsofgeogra phicalanalyses.
- Thepaperwillhelpprovidetheoreticalinsightsandperspectivestostudentsiftheywishtop ursuea researchprogrammeinfuture.
- ThepaperwillbeveryusefulforstudentspreparingforUGCNET-JRF/SLETexamandothercompetitiveexamsincludingcivilservices.

Theory Credits3

1. DefinitionandsignificanceofClimatology;CompositionandStructureofAtmosphere
2. InsolationandHeatBudget;horizontalandverticaldistributionoftemperature.
3. AtmosphericPressure-Pressurebelts;Typesofwinds.
4. Airmasses-meaningandcharacteristics;Fronts(formation,classification andtypes);cyclones(temperateandtropical)
5. Classificationofworldclimate(Koppen,Thornthwaite);Roleandresponseofmaninclima techange.

Practical Credits1

1. Handlinganduseofweatherinstruments.
2. InterpretationofweathermapofIndia.
3. Constructionandinterpretationofhythergraphandclimograph.
4. Vivavoceandpracticalnotebook.

ReadingList

1. BarryR.G.andCarletonA.M.,2001:SynopticandDynamicClimatology,Routledge,UK.
2. BarryR.G.andCorleyR.J.,1998:Atmosphere,WeatherandClimate,Routledge,NewYork.
3. CritchfieldH.J.,1987:GeneralClimatology,Prentice-HallofIndia,NewDelhi
4. Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: The Atmosphere: An Introduction toMeteorology,Prentice-Hall,EnglewoodCliffs,NewJersey.
5. OliverJ.E.andHidoreJ.J.,2002:Climatology:AnAtmosphericScience,PearsonEducation,N ewDelhi.
6. TrewarthaG.T.andHorneL.H.,1980:AnIntroductiontoClimate,McGraw-Hill.

CourseName:Hydrology
PaperCode: C14
TotalCredits:4

Course objectives

- Understandthebasiccomponentsofhydrologicalcycleandcomprehendpracticesofintegrated watershed management.
- Evaluatethe waterbalancing andriverbasin andwaterdisputes.
- Studythesoilas abasic resource,focusingitsdistribution, problems andmanagement.

C-14: Theory **Credits 3**

1. HydrologicalCycle:Systemsapproachinhydrology,humanimpactonthehydrologicalcycle; Precipitation, interception, evaporation, evapo-transpiration, infiltration, ground-water,runoffand overland flow;
2. Water Balance: input and output; water balance; floods and droughts; Integrated waterresourcemanagement.
3. River Basin: Characteristics and problems of river basins, basin surface run-off, andmeasurementofriver discharge.Watershedmanagement
4. RiverWaterDispute;Riverlinkages;Casestudies
5. Application of remotes sensing and GIS in monitoring and studying water resource/ water bodies.

C-14: Practical **Credit 1**

1. Cross section profiling of river banks, mapping of drainage
2. Thematic mapping: River water dispute area in India
3. Calculation of water balance
4. Vivavoceandpracticalnotebook.

References:

1. Andrew.D.ward,andStanley,Trimble.,(2004):EnvironmentalHydrology,2ndedition,Lewis Publishers, CRC Press.
2. Fetter,C.W.(2005):AppliedHydrogeology,CBSPublishers&Distributors,NewDelhi.
3. Reddy,K.Ramamohan,VenkateswaraRao,B,Sarala,C.,(2014):HydrologyandWatershed Management,Allied Publishers.
4. Karanth,K.R.,(1988):GroundWater:Exploration,AssessmentandDevelopment,
5. Tata-McGrawHill,New Delhi.
6. Ramaswamy, C., (1985): Review of floods in India during the past 75 years: APerspective,Indian NationalScienceAcademy,New Delhi.
7. Rao,K.L., (1982):India's WaterWealth,2ndedition,Orient Longman,Delhi.
8. Singh, M., Singh, R.B. and Hassan, M.I., (Eds.) (2014):Landscape ecology andwater management, Proceedings of IGU Rohtak Conference, Volume 2. AdvancesinGeographical and Environmental Studies, Springer.
9. Singh, Vijay P., (1995): Environmental Hydrology. Kluwar Academic Publications,TheNetherlands.

CourseName:Oceanography

PaperCode:C15

TotalCredits:5

Courseobjectives

- Toprovideknowledgeontheprinciples,conceptsandscopeofoceanography
- Tomakethestudentsunderstandabouttheimportanceandrelevanceofthestudyofoceanography asbranchesofphysicalgeographicstudy.

Courseoutcomes

- Thestudentswilllearnthedynamicprocessesassociatedwiththeoceansandalsotheimportanceandvaluesof theoceanresources.

C- 15: Theory **Credits 3**

1. Meaning, scope, branches and growth of oceanography; oceanography as a branch of science and geography.
2. SurfaceconfigurationofOceanFloor;OceanicMovements–Waves,CurrentsandTides.
3. OceanSalinityandTemperature–DistributionandDeterminants.
4. Coral Reef- Theories, types of coral reefs, Factors affecting formation of Coral Reefs.
5. Types & Classification ofMarineDeposits.

C- 15: Practical **Credits 1**

1. ConstructionandinterpretationofHypsometricandBathymetriccurve.
2. Mapping of ocean mineral resources
3. Interpretation and mapping of ocean currents (Kuroshio, Labrador etc) from satellite imageries
4. Viva voce and practical note book.

Reading List

1. AnikouchineW.A.andSternbergR.W.,1973:TheWorldOceans:AnIntroductiontoOceanography,Prentice-Hall.
2. GarrisonT.,1998:Oceanography,WordsworthCompany,Belmont.
3. KershawS.,2000:Oceanography:AnEarthSciencePerspective,StanleyThornes,UK.
4. Pinet P. R., 2008: Invitation to Oceanography(Fifth Edition), Jones and BarlettPublishers,USA,UKandCanada.
5. SharmaR.C.andVatalM.,1980:OceanographyforGeographers,ChaitanyaPublishing House,Allahabad.
6. Sverdrup K. A. and Armbrust, E. V., 2008: An Introduction to the World Ocean,McGrawHill,Boston.
7. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Landscape ecology and watermanagement. Proceedings of IGU Rohtak Conference, Volume 2. AdvancesinGeographicalandEnvironmentalStudies,Springer.
8. Wolcott,H.1995.TheArtofFieldwork.AltaMiraPress,WalnutCreek,CA.

CourseName:Statistical Methods in Geography

PaperCode:C16

TotalCredits:4

Course objectives

The paper Statistical Methods in Geography throws light on the importance of data in geography. • It deals with the methods and techniques of data collection, data tabulation, data interpretation and analysis. This paper provides an understanding of the pure and applied nature of Geography along with the key elements in the discipline.

C-16: Theory **Credits3**

1. Importance and significance of statistics in Geography
2. Sources of Geographical data for statistical analysis
3. Sampling: Need and types; Significance and methods of random sampling.
4. Theoretical distribution: Frequency, Cumulative frequency, normal and probability.
5. Measures of dispersion- range, mean deviation, standard deviation, coefficient of variation.

C-16: Practical **Credits1**

1. Measures of Central Tendency (Mean, Median and Mode).
2. Measures of Dispersion (Quartile deviation); Time series analysis of Temporal data.
3. Correlation (Karl Pearson method) and regression analysis.
4. Viva voce and practical note book

References:

1. Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.
2. Ebdon D., 1977: Statistics in Geography: A Practical Approach.
3. Gragory,S., :1963: Statistical
4. Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press.
5. King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
6. Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.

CourseName:Urban Geography

PaperCode: C17

TotalCredits:4

Courseobjectives

- Thispaperintroducesstudentstothefieldofurbangeographyanditsspecificities
- Itseekstodevelopnewinsightsamongstudentsontherelevanceofanurbaneconomyan dgeographyandassociatedproblemsinarapidlyurbanizingworld.

Courseoutcomes

- Thepaperwillbeuseful for students in developing ideas on howgeographical factors organize urban spaces and how geographers seek to addresscityspecificproblems andissues.
- Itwillbuildskillsforstudentsseekingtoenrolina research programmeand/orprovideopeningsforthemwithurban/cityplanningagencies.

C-17: Theory Credits3

1. Urbangeography:Introduction,natureandscope.
2. PatternsofUrbanizationindevelopedanddevelopingcountries.
3. Functionalclassificationoftowns;ModelsinUrbanstudies(ConcentricZoneModel,Mul tipleNucleimodel)
4. UrbanIssues:problemsofhousing,slums,civicamenities(waterandtransport)
5. CasestudiesofDelhiandChandigarhwithreferencetoLanduseandUrbanIssues.

C-17: Practical Credits1

1. MapshowingdistributionofclassIandIIurbancentresinNEIndiabyusingproportionates pheremethod.
2. CalculationofdistributionpatternofurbansettlementsinaDistrict/StateofN.E.Indiausin gNearestNeighbourAnalysis.
3. Choroplethmapshowingspatialpatternoflevelofurbanization inN.E.India.
4. Vivavoceandpracticalnotebook.

ReadingList

1. FyfeN.R.andKennyJ.T.,2005:TheUrbanGeographyReader,Routledge.
2. GrahamS.andMarvinS.,2001:SplinteringUrbanism:NetworkedInfrastructures,Technolo gicalMobilitiesandtheUrbanCondition,Routledge.
3. HallT.,2006:UrbanGeography,TaylorandFrancis.
4. KaplanD.H.,WheelerJ.O.andHollowayS.R.,2008:UrbanGeography,JohnWiley.
5. Ramachandran R (1989): Urbanisation andUrbanSystemsofIndia,OxfordUniversityPress,NewDelhi
6. Ramachandran,R.,1992:TheStudyofUrbanisation,OxfordUniversityPress,Delhi
7. Singh,R.B.(Eds.)(2001)UrbanSustainabilityintheContextofGlobalChange,SciencePub.,I nc.,Enfield(NH),USAandOxford&IBHPub.,NewDelhi.
8. Singh,R.B.(Ed.)(2015)Urbandevelopment, challenges, risksandresilience inAsianmegacitiesAdvancesinGeographicalandEnvironmentalStudies,Springer

CourseName:DisasterManagementPaper
Code:C18
TotalCredits:4

Courseobjectives

- Toimpartknowledgeondifferenttypesofdisasterstothestudents
- Toprovidepracticalknowledgeinthefieldonthecausesandimpactsofdisastersoccurring intimeandoverspace.
- Tomakethestudentslearnaboutthedisaster-specificmanagementstrategiestobeadoptedtoreducelossanddamages.

Courseoutcomes

- Thestudentswillexperiencegroundrealityofdestructivedamageofdisastersinthefield.
- Thestudentswiththeirexperiencemayextendallpossiblehelpandco-operationtothevictimsaswellasauthoritiesengagedindisastermanagement.
- Thestudentswillgainpracticalexperienceintheentireprocessofdisastermanagementthroughtheirprojectworkassignedonaspecificproblem.

C-18 (a):Theory **Credits3**

1. Disaster–definitionandconcepts:hazardsdisaster-riskandvulnerability.
2. ClassificationofDisaster:ManmadeandNaturalDisasters.
3. Disasters in India – Flood, landslide, earthquake and cyclone (causes, impactdistributionandmapping).
4. Humaninduceddisaster:Firehazard,chemical,industrialaccidents.
5. Responses and mitigation to disaster: Mitigation and preparedness, NDMA andNDIM; Indigenous Knowledge and Community Based Disaster management;Do'sandDon'tsDuringandPostDisasters.

C-18 (a): Practical **Credits1**

AProjectReportbasedonanyoneofthefollowing-

1. Floods
2. CycloneandHailstorms
3. Earthquake
4. Landslides
5. HumanInducedDisasters:FireHazards,Chemical,Industrialaccidents

ProjectReport

1. Eachstudentwillprepareanindividualprojectreportbasedonprimaryandsecondary datacollectedfromlocalarea.
2. Thewordcountofthereportshouldbeabout4000excludingfigures,tables,photographs,maps, referencesandappendices.
3. OnetypedcopyofthereportonA4sizepapershouldbesubmitted.

ReadingList

1. Kapur,A.(2010)VulnerableIndia:AGeographicalStudyofDisasters,SagePublication,New Delhi.
2. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and GeologicalDisasters,Macmillan,Delhi.
3. Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: VulnerabilityandMitigation,RawatPublications,NewDelhi.
4. Stoltman, J.P.et al.(2004)International Perspectives on Natural Disasters, KluwerAcademicPublications.Dordrecht.

5. Singh Jagbir (2007) "Disaster Management Future Challenges and Oppurtunities",2007. Publisher-I.K.International Pvt.Ltd.S-25, Green Park Extension, UphaarCinemaMarket,NewDelhi,India(www.ikbooks.com).

Minor Courses

CourseName:Biogeography
PaperCode: M1
TotalCredits:4

Courseobjectives

- Familiarisethedynamicsofclimateandrelatedtheories.
- Understandof Vegetationasanindexofclimate.
- Assessofdifferentaspectsoffloralandfaunalprovinces.

Theory **Credits3**

1. IntroductiontoBio-geography:Nature,scope,andcomponents.
2. WorldClimaticPatterns(Koppen)vis-à-visbiogeographicalregions
3. Ecosystem: Components and functioning, factors influencing plant growth.
4. Major biomes of the world
5. Biodiversity;bio-diversityhotspots,biodiversityconservation.

Practical **Credit1**

1. Identification of local flora and fauna.
2. Thematic mapping -Biodiversity hotspot.
3. Thematic mapping- Biogeographical regions of India.
4. Vivavoceandpracticalnotebook.

Reading list

1. Bhattacharyya,N.N.(2003):*Biogeography*,RajeshPublications,NewDelhi.
2. Huggett,R.J.(1998):*FundamentalsofBiogeography*,Routeldge,U.S.A.
3. Lal,D.S.2003.Climatology,Allahabad:ShardaPustakBhawan.
4. Lapedes,D.N.(1974): *EncyclopaediaofEnvironmentalScience*(eds.),McGrawHill.
5. Mal,Suraj.,andSingh,R.B.(Eds.)(2009):*BiogeographyandBiodiversity*,RawatPublication,Jaipur
6. Mathur,H.S. (1998):*Essentials ofBiogeography*, AnujPrinters, Jaipur.
7. Trewartha,G.T.,(1980):*AnIntroductiontoClimate*,McGrawHillCompany,NewYork

CourseName:SustainableResourceDevelopment

PaperCode: M3

TotalCredits:4

LearningOutcomes

- Afterthecompletionofcourse,the studentswill haveabilityto:
- Understanddifficultiesindefiningthe componentsofsustainabledevelopment;
- Distinguishthepatternsofregionaldevelopmentoftheworldandtheneedforsustainabledevelopmentplan;
- AppreciatetheeffortsandinitiativesoftheGovernmentsinreducingthelevelsofpovertyand inequalityamongthe peopleof variouscountries.

Theory **Credits3**

1. SustainableResourceDevelopment:Definition,Componentsand Limitations
2. TheMillenniumDevelopmentGoals:NationalStrategiesandInternationalExperiences
3. SustainableRegionalDevelopment:Needand examplesfromdifferentEcosystems.
4. Inclusive Development: Poverty and Inequality; Education, Health; Climate Change:The role of higher education in sustainable resource development; The Challenges ofUniversalHealth Coverage,
5. Sustainable Development Policies and Programmes: The proposal for SDGs at Rio+20;SDGs;Goal-BasedDevelopment;FinancingforSustainableDevelopment;PrinciplesofGoodGovernance; National Environmental Policy, CDM.

Practical **Credit1**

1. Interpretation of crop rotation in Naga society
2. Site suitability mapping for sustainable planning (settlement, green space, agriculture etc)
3. Practical on recycling and regeneration
4. Viva and practical record

Reading list

1. Agyeman,Julian,RobertD.BullardandBob,Evans.,(Eds.)(2003):JustSustainabilities:DevelopmentinanUnequalWorld.London:Earthscan.(Introductionand conclusion.).
2. Ayers,JessicaandDavid,Dodman.,(2010):"ClimatechangeadaptationanddevelopmentI:thestateofthedebate".ProgressinDevelopmentStudies10(2):161-168.
3. Baker, Susan., (2006): Sustainable Development. Milton Park, Abingdon, Oxon;NewYork,N.Y.: Routledge.
4. Brosius, Peter., (1997): "Endangered forest, endangered people: Environmentalistrepresentationsof indigenous knowledge",Human Ecology25: 47-69.
5. Lohman,Larry.,(2003):Re-imaginingthepopulationdebate,CornerHouseBriefing.

CourseName:RuralDevelopment

PaperCode: M5

TotalCredits:4

LearningOutcomes

- Appreciatetheconcepts,needsand variousapproachesto ruraldevelopment;
- Understandthestrongeconomicbasesofruralareasof India;
- Appreciatetheareabasedandtargetgroupbasedapproachesandprovisionofservicestorural development.

Theory **Credits3**

1. DefiningDevelopment:Inter-DependenceofUrbanandRuralSectorsoftheEconomy;Needfor Rural Development, GandhianApproach of Rural Development.
2. RuralEconomicBase:PanchayatiRajSystem,AgricultureandAlliedSectors,Seasonalityand NeedforExpandingNon-FarmActivities, Co-operatives,PURA.
3. AreaBasedApproachtoRuralDevelopment:DroughtProneAreaProgrammes,PMGSY.
4. TargetGroupApproachtoRuralDevelopment:SJSY,MNREGA,JanDhanYojanaandRural Connectivity.
5. Provision of Services – Physical and Socio-Economic Access to Elementary EducationandPrimaryHealth Care and Micro credit

Practical **Credits1**

1. Geographical representation of livestock and crops using methods like pie chart etc.
2. Change mapping of rural landscape scenario from Northeast India
3. Mapping of land pattern in agriculture in Nagaland
4. Viva and Practical record

Reading list

1. Anand,Subhash.,(2013):DynamicsofRuralDevelopment,ResearchIndiaPress,Delhi
2. Krishnamurthy,J.,(2000):RuralDevelopment-ProblemsandProspects,RawatPubls.,Jaipur
3. Lee,D.A.andChaudhri,D.P.,(eds.)(1983):RuralDevelopmentandState,Methuen,London.
4. Misra,R.P.,andSundaram,K.V.,(eds.)(1979):RuralAreaDevelopment:Perspectivesand Approaches, Sterling, New Delhi.
5. Misra,R.P.,(ed.),(1985):RuralDevelopment:CapitalistandSocialistPaths,Vol.1,Concept ,New Delhi.
6. Singh,R.B.,(1985):GeographyofRuralDevelopment,Inter India,NewDelhi.

CourseName: **Climate Change Vulnerability and Adaptation**

PaperCode: M7
TotalCredits:4

Courseoutcomes

- Understandthe foundationalconceptsofclimatechange anditsimpacts.
- Assessthehumanandenvironmentalvulnerabilitytoclimatechange.
- Learnthevariousadaptationandmitigationforreducing theimpactsofclimatechangeandnational action plan.

C-13: Theory **Credits 3**

1. ClimateChange:UnderstandingClimateChange;GreenhouseGasesandGlobalWarming; Global Climatic Assessment-IPCC
2. ClimateChangeandVulnerability:PhysicalVulnerability;EconomicVulnerability;Social Vulnerability
3. ImpactofClimateChange:AgricultureandWater;FloraandFauna;HumanHealth
4. AdaptationandMitigation:Global Initiativeswith ParticularReferenceto SouthAsia.
5. NationalActionPlanonClimateChange;LocalInstitutions(UrbanLocalBodies,Panchayat s)

C-13: Practical **Credits 1**

1. Representation and analyzing weather and climate data: rainfall, temperature and humidity.
2. Time series analysis of temporal data.
3. Mapping of drainage flow change, glacier study from satellite imageries
4. Vivavoceandpracticalnotebook.

References:

1. IPCC(2014):ClimateChange2014:Impacts,Adaptation,andVulnerability.PartA:Globala ndSectoralAspects.ContributionofWorkingGroupIItotheFifthAssessment Report of the Intergovernmental Panel on Climate Change CambridgeUniversityPress, Cambridge,United Kingdom andNew York, NY, USA.
2. IPCC(2007):ClimateChange2007:Impacts,AdaptationandVulnerability.Contributionof WorkingGroupIItotheFourthAssessmentReportoftheIntergovernmentalPanelon ClimateChange.
3. OECD (2008): Climate Change Mitigation: "What do we do?"(Organisation andEconomicCo-operation and Development).
4. Sen, Roy, S., and Singh, R.B., (2002): Climate Variability, Extreme Events andAgriculturalProductivityin MountainRegions, Oxford& IBHPub., New Delhi.
5. Joseph,G.(2005): FundamentalsofRemoteSensing,UnitedPressIndia.
6. Kumar,Dilip,Singh,R.B.andKaur,Ranjeet(2019):SpatialInformationTechnologyfor SustainableDevelopment Goals,Springer.
7. Nag,P.and Kudra,M., (1998):DigitalRemoteSensing,Concept, NewDelhi.
8. Sarkar,A.(2015):Practicalgeography:Asystematicapproach.OrientBlackSwanPrivate Ltd., New Delhi
9. Singh,R.B.andMurai,S.,(1998):Space-informaticsforSustainableDevelopment,OxfordandIBH Pub

SkillEnhancementCourse(SEC)

CourseName: ThematicMaps
PaperCode:S1
TotalCredits:3

Courseoutcomes

- Generalunderstandingofmapcharacteristicsandmapdesign.
- Understandingthetechniquesofpreparingdifferentthematicmaps

Course content

1. Maps–ClassificationandTypes;PrinciplesofMapDesign.CartographicOverlays–Point,LineandArealData.
2. DiagrammaticDataPresentation – Line,Barand Circle.
3. Thematic Mapping Techniques – Properties, Uses and Limitations; Areal Data -- Choropleth,Dot, ProportionalCircles; PointData–Isopleths.

Reading list

1. Singh,R.L,andDuttta,P.K.,(2012):*PrayogatamaBhugol*,CentralBookDepot,Allahabad
2. Cuff,J.D.andMattson,M.T.,(1982):*ThematicMaps:TheirDesignandProduction*,Methue nYoungBooks
3. Dent,B.D.,Torguson,J.S.,andHolder,T.W.,(2008): *Cartography:ThematicMapDesign*(6th Edition), McGraw Hill Higher Education
4. Gupta,K.K.andTyagi,V.C.,(1992):*WorkingwithMaps*,SurveyofIndia,DST,NewDelhi.
5. Kraak,M.J.andOrmeling,F.,(2003):*Cartography:VisualizationofGeo-SpatialData*,Prentice-Hall.

CourseName: Remote Sensing

PaperCode: S3

TotalCredits:3

Courseoutcomes

- ThispaperintendstointroducestudentstotheinterfaceofRemoteSensing.
- It seeks to develop new insights among students on the relevance of geospatialstudies within the field of geography.

Courseoutcomes

- Thepaper remains useful for students indeveloping skillsin spatialdata analysis iftheywishtopursuearesearchprogramme.
- The students will be equipped with the application of remote sensing in various fields.

Course content

1. RemoteSensing:Definition,Development;PlatformsandTypes, Application of Remote Sensing inForests Monitoring, Water Resources and Natural hazards.
2. Aerial Photography and Satellite Remote Sensing: Principles, Types and Geometry ofAerial Photograph; EMR Interaction with Atmosphere and Earth Surface; Satellites –geostationary and remote sensing (Landsat and IRS) and Sensors, Resolution (spatialandtemporal).
3. Introduction to Image Processing and Data Analysis: Geo-Referencing; Editing andOutput.

Reading list

1. Campbell J.B., 2007: Introduction to Remote Sensing, Guildford Press.
2. Jensen J.R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
3. Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
4. Lillesand T. M., Kiefer R. W. and Chipman, J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).

CourseName: Geographical Information system

PaperCode: S4

TotalCredits:3

Courseobjectives

- Thispaperintendstointroducestudentstotheinterfaceof Geo-technological science and application.
- It seeks to develop new insights among students on the relevance of geospatial studies within the field of geography.

Courseoutcomes

- Thepaper remains useful for students indeveloping skillsin spatialdata analysis iftheywishtopursuearesearchprogramme.
- The students will be equipped with the application of GIS in various fields.

Course content

1. GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure.
2. Functions in GIS- Overlay function, rubber sheeting, big data .
3. Interpretation and Application of GIS: Land use/ Land Cover, Urban Sprawl Analysis, crime study.

Reading list

1. AnjiReddy,M.(2008):TextbookofRemoteSensingandGeographicInformationSystem,B .S. Publication, Hyderabad
2. Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
3. Rees W.G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
4. Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
5. Campbell,J. B.,(2007): Introductionto RemoteSensing, GuildfordPress.