Savitribai Phule Pune University

(Formerly University of Pune)

Bachelor of Science (B.Sc.) in Geography

(Faculty of Science & Technology)

New Syllabus of F.Y. B. Sc. Geography

(As Per National Education Policy (NEP) 2020)

For Colleges Affiliated to Savitribai Phule Pune University

To be implemented from Academic Year 2024-2025

Approved by

Board of Studies (BOS) in Geography,

Savitribai Phule Pune University, Pune

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Abbreviation Used

NEP
- National Education Policy

DSE
- Discipline Specific Courses

T
- Theory Courses

P
- Practical Courses

GE/OE
- Generic Elective/Open Elective

SEC
- Skill Enhancement Courses

IKS
- Indian Knowledge System

AEC
- Ability Enhancement Courses

VEC
- Value Education Courses

CC
- Co-curricular Courses

OJT
- On Job Training

CEP
- Community Engagement Programme

FP
- Field Projects

RM
- Research Methodology

RP
- Research Projects

VSC
- Vocational Skill Courses

Introduction to Undergraduate Degree in Geography

As per the recommendations of UGC and Savitribai Phule Pune University guidelines, the undergraduate(UG) degree course in Geography is a 6-semester course for 3-academic years or 8-semester coursefor 4-academic years. The curriculum framework design is as per UGC, Savitribai Phule Pune University, NEP 2020 guidelines with the approach of student-centric Teaching-Learning Process (TLP). B.Sc. Geography course involves theory, practicals, vocational and skill-based verticals. The expected programme specific outcomes outline with graduate attributes. The vision of NEP followed to enable the interdisciplinary and multidisciplinary approach within the syllabus structure. Students have appropriate flexibility in pursuing various courses and multiple entry/exit at UG level.

Award of UG Certificate/ UG Diploma/ Bachelor's Degree in Geography

Sr. No.	Type of Award	Stage of Exit OR Continue with Major and Minor
1	UG Certificate in Geography	Exit Option: After successful completion of first year; Award of UG Certificate with 44 credits and an additional 4 credits Course NSQF courses/Internship Continue Option: From the DSE courses Students will select Geography subject among the (subject-1, subject-2 and subject-3) as a major and another as minor and third subject will be dropped.
2	UG Diploma in Geography	After successful completion of Second year; Award of UG Diploma in Major and Minor with 88 credits and an additional 4 credits Course NSQF courses/Internship OR Continue with Major and Minor
3	Bachelor of Science in Geography	After successful completion of Third year; Award of UG Degree in Major with 132 credits and an additional 4 credits Course NSQF courses/Internship OR Continue with Major and Minor
4	Bachelor of Science in Geography (Honours)	After successful completion of Semester Fourth year Award of UG Degree (Honours) in Major with 176 credits and an additional 4 credits Course NSQF courses/Internship

Objectives of the B.Sc. Geography Programme

1. To familiarize students with fundamentals concepts and principles of Geography
2. To guide students in an identification and analysis of various facets of geographical features and processes.
3. To enhance students ability in spatial analysis, relationship between people, places and environment
4. To develop critical thinking and problem solving skills, analytical and scientific reasoning, reflective thinking, moral and moral & reflective awareness amongst the students
5. To facilitate the students to learn skills of cartographic techniques, data analysis and interpretation, carrying out field work, use of Geoinformatics techniques, research projects, applications and applied studies.

Programme Specific Outcomes: B.Sc. Geography

Sr. No.	**PSO Statement :** After completing the B.Sc. in Geography, Students will be able to	**Knowledge and Skills**
PSO 1	Illustrate the geographical concepts and theories, practicals, regional approach focus on global, continental, countrywide and statewide	Disciplinary knowledge
PSO 2	Understanding the ethical consideration in geographic research and environment values in developing sustainable resolves	Moral & ethical awareness
PSO 3	Interpret the spatial relationships between places, people and environment	Spatial analysis skills
PSO 4	Apply geographic knowledge and skills to solve real-world problems and issues	Critical thinking & Problem Solving Ability
PSO 5	Analyze and interpret spatial data using GIS, Remote sensing and cartographic techniques	Analytical reasoning / digitally literacy
PSO 6	Appraise geographic issues and regional to global perspectives in the context of sustainability	Scientific reasoning
PSO 7	Capability to design, conduct and present field work/survey projects and research projects	Research related skills/self-relative learning
PSO 8	Develop team work and leadership qualities through seminars, outdoor practicals, field work and study tours	Team work /leadership qualities
PSO 9	Evaluate human impacts on environment and develop sustainable resolves	Reflective thinking/
PSO 10	Creating skills for professional careers in the field of environmental management, rural development, urban planning, geospatial technologies, cartography, field survey techniques**,** disaster management, tourism sector etc	Preparation for livelihoods/lifelong learnings

Structure of the Programme

The detailed framework of Undergraduate (B.Sc.) Degree Programme in Geography

Level	Sem	DSE Subject-1	DSE Subject -2	DSE Subject -3	GE/OE	SEC	IKS	AEC	VEC	CC	Total
4.5/ 100	**I**	GEO(S) 101 Fundamentals of Physical Geography [2 T] GEO(S) 102 Practicals in Physical Geography [2 P]	2(T) + 2(P)	2(T) + 2(P)	(Select any one of the following) OE 101 GEO(S) Geography of Rural Development [2 T] *OR* OE 102 GEO(S) Agriculture Geography [2 T]	(Select any one of the following) SEC 101 GEO(S) Introduction to Cartography [2 T] *OR* SEC 102 GEO(S) Introduction to Digital Mapping [2 T]	2 (T) Generic	2 T	2	-	**22**
	II	GEO(S) 151 Fundamentals of Human Geography [2 T] GEO(S) 152 Practicals in Human Geography [2 P]	2(T) + 2(P)	2(T) + 2(P)	(Select any one of the following) OE 151 GEO(S) Practicals in Rural Development [2 P] *OR* OE 152 GEO(S) Practicals in Agriculture Geography [2 P]	(Select any one of the following) SEC 151 GEO(S) Practicals in Cartographic Techniques [2 P] *OR* SEC 152 GEO(S) Practicals in Digital Mapping [2 P]	-	2 T	2	2	**22**

Exit option: Award of UG Certificate in Major with 44 credits and an additional 4 credits Course NSQF courses/Internship OR Continue with Major and Minor

Continue Option: Students will select one subject among the (subject-1, subject-2 and subject-3) as a major and another as minor and third subject will be dropped.

Important instructions:

a. For the practical courses teaching batch size: 15 students per batch

Structure of the Programme

The detailed framework of Undergraduate (B.Sc.) Degree Programme in Geography

Continued …..

Level	Sem	Credits Related to Major				Minor	GE/OE	SEC	IKS	AEC	VEC	CC	Total
		Major Core	Major Elective	VSC	FP/OJT/ CEP								
5.0/ 200		**GEO(S) 201 MJ** Geomorphology [4T] **GEO(S) 202 MJP** Practicals in Geomorphology [2P]		**(Select any one of the following)** **GEO(S) 221 VSC** Water Analysis [2T] ***OR*** **GEO(S) 222 VSC** Land Measurement and Surveying [2T]	**GEO(S) 231 FP** Field Visit and Report Writing [2 FP]	**GEO(S) 241 MN** Geography of India [2 T] **GEO(S) 242 MNP** Practicals in Map Elements [2 P]	**OE 201 GEO(S)** Geography of Soil [2 T]		**GEO(S) 201 IKS** Development of Indian Geographical Knowledge [2 T]	2 T	-	2	22
	IV	**GEO(S) 251 MJ** Fundamentals of Population and Settlement Geography [4 T] **GEO(S) 252 MJP** Practicals in Fundamentals of Population and Settlement Geography [2 P]		**(Select any one of the following)** **GEO(S) 271 VSC** Practicals in Water Analysis [2 P] ***OR*** **GEO(S) 272 VSC** Practicals in Land Measurement and Surveying [2 P]	**GEO(S) 281 CEP** Community Engagement Programme [2 CEP]	**GEO(S) 291 MN** Geography of Maharashtra [2 T] **GEO(S) 292 MNP** Practical in Weather Study [2 P]	**OE 251 GEO(S)** Practicals in Use of Google Earth [2 P]	**SEC GEO(S) 251** Practicals in statistical analysis [2 P]	-	2 T	-	2	22
Exit option: Award of UG Diploma in Major and Minor with 88 credits and an additional 4 credits Course NSQF courses/Internship OR Continue with Major and Minor													

Important Instruction

a. It is mandatory to have a certified journal during the practical examination of the practical courses

b. Both Practical and theory courses have internal and external examination and evaluation pattern

c. Practical courses external examination pattern (skeleton) will be provided by BOS Geography

d. The batch size for practical course is 12 students per batch.

Structure of the Programme

The detailed framework of Undergraduate (B.Sc.) Degree Programme in Geography

Continued …

Level	Sem.	Credits Related to Major				Minor	DSE 2 & 3	GE/ OE	SEC	IKS	AEC	VEC	CC	Total
		Major Core	Major Elective	VSC	FP/OJT/ CEP									
5.5 / 300	V	**GEO(S) 301 MJ** Regional Geography of India [4T] **GEO(S) 302 MJ** Introduction to GIS [4 T] **GEO(S) 303 MJP** Practicals in Map Projections and Statistical Analysis [4 P]	**(Select any one of the following)** **GEO(S) 310 MJ** Geography of Maharashtra [2 T] ***OR*** **GEO(S) 311 MJ** Soil Geography [2 T] **(Select any one of the following)** **GEO(S) 312 MJP** Practicals in GIS [2 P] **OR** **GEO(S) 313 MJP** Practicals in Soil Geography [2 P]	**(Select any one of the following)** **GEO(S) 321 VSC** Introduction to GPNS [2 T] ***OR*** **GEO(S) 322 VSC** Fundamentals of Tourism Geography [2 T]	**GEO(S) 331 FP/CEP** Field visit and report writing [2 FP]	**GEO(S) 341 MN** Hydrology [2 T]									22
	VI	**GEO(S) 351 MJ** Watershed Analysis [4T] **GEO(S) 352 MJ** Introduction to Remote Sensing [4 T] **GEO(S) 353 MJP** Practicals in Advanced Spatial Analysis [4 P]	**(Select any one of the following)** **GEO(S) 360 MJ** Oceanography [2 T] ***OR*** **GEO(S) 361 MJ** Disaster Management [2 T] **(Select any one of the following)** **GEO(S) 362 MJP** Practicals in Remote Sensing [2 P] ***OR*** **GEO(S) 363 MJP** Practicals in Watershed Management [2 P]	**(Select any one of the following)** **GEO(S) 371 VSC** Practicals in Modern Surveying [2 P] ***OR*** **GEO(S) 372 VSC** Practicals in Fundamentals of Tour Planning [2 P]	**GEO(S) 381 OJT** [4 OJT]									22
Total 3 Year		**44**	**8**	**8**	**10**	**18**	**8**	**8**	**6**	**4**	**8**	**4**	**6**	**132**

Exit option: Award of UG Degree in Major with 132 credits and an additional 4 credits Course NSQF courses/Internship OR Continue with Major and Minor

Methods of Assessment

Examination Pattern:

2 Credits Course Examination Pattern:			
Evaluation Details	Total Marks	Internal Examination **(Continuous Internal Evaluation)**	External Examination **(End Semester University Examinations)**
Total Marks	50	15	35
Marks for passing	20	06	14
Examination Evaluation Pattern		▪ Class test/examination - Short Questions, Quizzes, MCQs :Marks – 10 ▪ Home assignment /Oral examination/ Students seminar/ presentation/field visit/survey/project work :Marks – 05	Q.1 Answer the following question in 20 words (any five) Marks – 10 Q.2 Answer the following question in 50 words (any two) Marks – 10 Q.3 Answer the following question in 100 words (any two) Marks – 15
4 Credits Course Examination Pattern:			
Evaluation Details	Total Marks	Internal Examination **(Continuous Internal Evaluation)**	External Examination **(End Semester University Examinations)**
Total Marks	100	30	70
Marks for passing	40	12	28
		▪ Tutorial/examination Short Questions, Quizzes, MCQs :Marks – 20 ▪ Home assignment /Oral examination/ Students seminar/ presentation/field visit/survey/project work :Marks – 10	Q.1 Answer the following question in 20 words (any eight) Marks – 16 Q.2 Answer the following question in 50 words (any four) Marks – 16 Q.3 Answer the following question in 100 words (any two) Marks – 18 Q.4 Answer the following question in 300 words (any one) Marks – 20

Important instructions:

a. It is mandatory to have a certified journal during the practical examination for practical courses.

b. Both practical & theory courses have internal and external examination and evaluation pattern

c. Practical course external examination pattern (Skelton) will be provided by BOS Geography before the end semester examination

d. For the practical courses batch size: 15 students per batch.

Savitribai Phule Pune University, Pune

B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	I
Name of Vertical Group	**:**	Subject I
Course Code	**:**	GEO(S)101-T
Course Title	**:**	Fundamentals of Physical Geography
Type of course	**:**	Theory
Total Credits	**:**	02
Workload	**:**	2 credits x 15 hours = 30 hours

Objectives of the Course:

1. To acquaint students with basic principles of Physical Geography
2. To introduce the processes and patterns in the atmosphere, hydrosphere and lithosphere.
3. To develop scientific insights into dynamics of the earth system.

Topics and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
1.	Introduction to Physical Geography	i. Meaning, Definition and Introduction of Geography ii. Definition and introduction of Physical Geography iii. Nature and Scope of Physical Geography iv. Branches of Physical Geography v. Importance of Physical Geography	08
2	Lithosphere	i. Interior of the Earth –Structure and Composition ii. Wegener's Continental Drift Theory	06
3.	Atmosphere	i. Concept of Weather and Climate ii. Composition and vertical structure of the Atmosphere iii. Factors affecting of distribution of temperature	08
4.	Hydrosphere	i. General structure of ocean floor ii. Movements of ocean water a. Tides- meaning, causes and types	08

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Understand fundamental concepts, theories and approaches of Physical Geography

CO 2 : Recognize functions of complex interactive earth systems.

CO 3 : Demonstrate scientific explanation of physical processes of the atmosphere, hydrosphere and lithosphere.

CO 4 : Describe general structure of the atmosphere and ocean tides

References:

1. Dayal P., (1996), Text Book of Geomorphology, Shukla Book Depot, Patna.
2. Husain, M., (2001), Fundamentals of Physical Geography, Rawat Publication, Jaipur.
3. Karlekar Shrikant (2019), Introduction to Physical Geography, Daimond Publication, Pune
4. Kale V.S. and Gupta A., (2001), Elements of Geomorphology, Oxford Univ. Press.
5. Lal, D. S., (1998), Climatology, Chaitanya Publishing House, Allahabad.
6. Lutgens, F.K. and Tarbuck, E.J., (2007), The Atmosphere, Pearson Prentice Hall, New Jersey.
7. Monkhouse F.J., (1951), Principles of Physical Geography, McGraw Hill Pub - New York.
8. Siddhartha, K., (2001), The Earth's Dynamic Surface, Kisalaya Publications Pvt. Ltd, New Delhi.
9. Singh Savindra., (2000), Oceanography, Prayag Pustak Bhavan, Allahabad.
10. Singh Savindra., (2000), Physical Geography, Prayag Pustak Bhavan, Allahabad.
11. Strahler Alen (1994) Introducing Physical Geography, Wiley

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B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	I
Name of Vertical Group	**:**	Option 1
Course Code	**:**	GEO(S)102 - P
Course Title	**:**	Practicals in Physical a Geography
Type of course	**:**	Practical
Total Credits	**:**	02
Workload	**:**	2 credits x 30 hours = 60 hours

Objectives of the Course:

1. To acquaint students with methods of relief representation
2. To understand landform and slopes using characteristics and pattern of contours

Topics and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
01	Qualitative Methods of Relief Representation	Characteristics and use of a. Hachures b. Hill Shading c. Color shading or tinting	17
02	Quantitative Methods of Relief Representation	Characteristics and use of a. Spot Height b. Bench Mark c. Triangulation Method d. Contours	17
03	Representation of slope and landforms by contours	I. Representation of slope by contours a. Gentle and steep slope b. Even and uneven slope c. Concave and convex slope ii.Representation of landforms by contours a. Conical hill b. Cliff c. Valley d. Ridge e. Plateau f. Spur ii.Identification of Relief/Landforms-Use Google Earth programme to show various slope types and landforms using 3D View, Vertical exaggeration tools.	26
		(One or not more than 3 days study tour can conduct)	

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Identify different methods of relief representation

CO 2 : Acquire knowledge of quantitative and qualitative method of relief representation

CO 3 : Apply methods of relief representation in landform identification

CO 4 : Recognize slope types using contour patterns

References:

1. Ahirrao, D. Y. And Karanjkhele, E.K., (2002), Pratyakshik Bhugol, Sudarshan Publication, Nashik.
2. Chandana, R. C., (2015), Geography of Population, Kalyani Publisher, New Delhi.
3. Hans Raj, (1978), Fundamentals of Demography: (population Studies with Special Reference to India), Surjeet Publication, Delhi.
4. Jadhav, S., Chaudhari, A. and Chaudhari, A., (2020), Pratyakshik Bhugol, Prashant Publication, Jalgaon.
5. Nagtode P. M., and Lanjewar H.D., (2009), Nakashashtra, Pimplapure Publication, Nagpur
6. Sarkar Ashis, (2015), Practical Geography: A Systematic Approach, Orient Blackswan Pvt Ltd, Hydrabad
7. Singh, G., (2005), Map Work and Practical Geography, Vikas Publishing House Pvt. Ltd., New Delhi.
8. Singh, R.L., (2005), Elements of Practical Geography. Kalyani Publishers, New Delhi.
9. Singh, J. and Dhillon, S., (1994), Agricultural Geography. McGraw Hill Education India Pvt Ltd, New Delhi.

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Savitribai Phule Pune University, Pune
B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	I
Name of Vertical Group	**:**	Open Elective (V-4)
Course Code	**:**	OE-101-T GEO(S)
Course Title	**:**	Geography of Rural Development
Type of course	**:**	Theory
Total Credits	**:**	02
Workload	**:**	2 credits x 15 hours = 30 hours

Objectives of the Course:

1. To understand the concept, nature and scope of rural development in India.
2. To overview various approaches to rural development.
3. To discuss some important issues related to rural development.
4. To study various schemes and policies of rural health in India.

Topics and Learning Points

Topic No.	Topic Name	Sub Topics	No. of Hours
1.	Introduction	1.1 Concept of rural development 1.2 Definition and meaning of rural development 1.3 Causes of rural backwardness 1.4 Nature and scope of rural development	8
2.	Approaches to Rural Development in India	2.1 Gandhian approach 2.2 Decentralized planning approach 2.3 Sectoral approach 2.4 Participatory approach	10
3.	Issues of Rural Development	3.1 Lack of potable drinking water 3.2 Sanitation problems and programs 3.3 Green revolution and its benefits to urban and rural sectors 3.4 Urban-rural divide 3.5 Health care services	12

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Learn the concept, nature and importance of rural development to India

CO 2 : Understand different approaches of rural development for successful applications of schemes.

CO 3 : Describe different issues and post-implantation of different schemes in rural area.

CO 4 : Know about health care services in rural areas.

References:

1. S. K. Bansal, Intermation Technology and Globalization APII Publishing Corp. Ansari Rd. Dayraganj Delhi.
2. Anand, Subhash (2013), Dynamics of Rural Development. Delhi, India: Research India Press.
3. Mukundan, N., Rural Development and Poverty eradication in India.
4. Krishnamurthy, J. (2000), Rural Development - Problems and Prospects. Jaipur, India: Rawat Publs.
5. Ramachandran, H. and Guimaraes, J. P. C. (1991). Integrated Rural Development in Asia– Leaning from Recent Experience, New Delhi, India: Concept Publishing.
6. Palione, M. (1984), Rural Geography. London, UK: Harper and Row.
7. Dutt and Sundaram (2013), Indian Economy, S. Chand Publications, New Delhi.
8. Mishra, S. K. and Puri V. K. (2012), Economics of Development and Planning, Himalaya Publishing House, Mumbai.
9. K. Vijayakumar, Empowerment of weaker section future planning and strategies for Rural Development in India.
10. Shankar Chatterjee, Implementation of Rural Development.
11. Singh, R. B. (1985), Geography of Rural Development. New Delhi, India, Inter India.
12. Gilg A. W. (1985), An Introduction to Rural Geography, Edwin Arnold, London.
13. Misra R. P. and Sundaram, K. V. 1979, Rural Area Development: Perspectives
14. Mukherjee, Neela (1993). Participatory Rural Appraisal: Methodology and Application. Delhi, India: Concept Publs Co.
15. Rural Development Satya Sundaram, Himalaya publication House, Mumbai
16. Indian economy, R. D. Sudharam Chand and Co. Ramnagar, New Delhi.
17. Dr. B. S. Nagi, Commercial Geography, Kedarnath Ramnath publications, Meerut.
18. T. Y. Rao, Human Resource Development, SAGE Publication, New Delhi.
19. Katar Singh,Rural Development: Principles, Policies and Management.
20. Jasbir singh and S.S. Dhillon, Agricultural Geography (Second edition), Tata McGraw Hill.
21. Vasant Desai (2012), Rural Development in India, Himalaya Publishing House, Mumbai.

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Savitribai Phule Pune University, Pune
B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	I
Name of Vertical Group	**:**	OE
Course Code	**:**	OE 102-T GEO(S)
Course Title	**:**	Agriculture Geography
Type of course	**:**	Theory
Total Credits	**:**	02
Workload	**:**	2 credits x 15 hours = 30 hours

Objectives of the Course:

1. To introduce students with the concept and practice of agricultural
2. To make aware students about the significance of sustainable agricultural economics.
3. To make attentive of agriculture revolution in Indian

Topics and Learning Points

Topic No.	Topic Name	Sub Topics	No. of Hours
1.	Introduction to Agriculture Geography	i. Definition of Agricultural Geography ii. Nature and Scope of Agricultural Geography iii. Significance of Agricultural Geography iv. Physical and Economic Factors Affecting on Indian Agriculture	12
2.	Types of Agriculture	i. Basis of Agricultural Classification ii. Agricultural Types: Intensive, Subsistence, Extensive, Mixed, Commercial and Plantation Agriculture iii. New Perspectives on Types of Agriculture	12
3.	Agricultural Revolution	Agricultural Revolution in India: Introduction, Merits and Demerits of i. Green revolution ii. White revolution iii. Blue revolution	06

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Understand the significance of agriculture
CO 2 : Analyse conventional and modern of agriculture
CO 3 : Classified major types and characteristics of agriculture.
CO 4 : Learn significance of agricultural policy and its impacts on sustainable farming.

References:

- Barkley, A., & Barkley, P. W. (2016). Principles of agricultural economics. Routledge.
- Cramer, G. L., Jensen, C. W., & Southgate Jr, D. D. (2001). Agricultural economics and agribusiness (No. Ed. 8). John Wiley and Sons.
- Ellis, F. (1992). Agricultural policies in developing countries. Cambridge university press.
- Gray, L. C. (2013). Introduction to agricultural economics. Read Books Ltd.
- Grigg, D. (2003). An introduction to agricultural geography. Routledge.
- Hill, B. E. (2023). The common agricultural policy: past, present and future (Vol. 14). Taylor & Francis.
- Morgan, W. B., & Munton, R. J. C. (1971). Agricultural geography. Routledge.
- Newbury, P. A. (1980). A geography of agriculture. Macdonald and Evans Ltd.
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Savitribai Phule Pune University, Pune
B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	I
Name of Vertical Group	**:**	SEC
Course Code	**:**	SEC 101-T GEO(S)
Course Title	**:**	Introduction to Cartography
Type of course	**:**	Theory
Total Credits	**:**	02
Workload	**:**	2 credits x 15 hours = 30 hours

Objectives of the Course:

1. To understand the principles and historical development of cartography and its evolution over time.
2. To introduce the students with the fundamental concepts and techniques of cartography.
3. To enable students to use various data visualisation techniques in Cartography.
4. To recognize the importance of cartography in various fields and applications.

Topics and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
1	Introduction of Cartography	i. Meaning and definition of cartography ii. Importance of cartography iii. Elements of map iv. Applications of cartographic techniques	08
2	Map Scale	i. Definition of Map Scale ii. Types of Map Scale a. Verbal scale b. Representative fraction c. Graphical scale iii. Globe and Earth	10
3	Concept of Time	i. Latitudes-Characteristics ii. Longitudes –Characteristics iii.Time a. Local Time b. Standard Time c. International/Greenwich Time iv. International date line	12

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Recognize the key terminologies and principles associated with cartography.

CO 2 : Describe the major technological advancements in cartographic techniques over time.

CO 3 : Develop skills needed to create meaningful maps and data visualisations, enhancing their ability to convey information and represent geographical data.

References:

1. Bhopal Singh, R. L., and Dutta, P. K., (2012), Prayogatama Bhugol, Central Book Depot, Allahabad.
2. Cuff J. D. and Mattson M. T., (1982), Thematic Maps: Their Design and Production, Methuen Young Books.
3. Dent B. D., Torguson J. S., and Holder T. W., (2008) Cartography: Thematic Map Design (6th Edition), Mcgraw-Hill Higher Education
4. Gupta K. K. and Tyagi V. C., (1992), Working with Maps, Survey of India, DST, New Delhi.
5. Kraak M. J. and Ormeling F., (2003), Cartography: Visualization of Geo-Spatial Data, Prentice-Hall.
6. Mishra R. P. and Ramesh A., (1989), Fundamentals of Cartography, Concept, New Delhi.
7. Sarkar, A., (2015), Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
8. Sharma J. P., (2010), Prayogic Bhugol, Rastogi Publishers, Meerut.
9. Singh R. L. and Singh R. P. B., (1999), Elements of Practical Geography, Kalyani Publishers.
10. Singh, L. R. and Singh, R., (1977), Manchitra or Pryaogatamek Bhugol , Central Book, Depot, Allahabad
11. Slocum T. A., Mcmaster R. B. and Kessler F. C., (2008), Thematic Cartography and Geo visualization (3rd Edition), Prentice Hall.
12. Tyner J. A., (2010), Principles of Map Design, The Guilford Press.

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B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	I
Name of Vertical Group	**:**	SEC
Course Code	**:**	SEC 102-T GEO(S)
Course Title	**:**	Introduction to Digital Mapping
Type of course	**:**	Theory
Total Credits	**:**	02
Workload	**:**	2 Credits x 15 hours = 30 hours

Objectives of the Course:

1. To introduce the students about GIS components
2. To enable students with basics of map layout and GIS data
3. To enhance the students' knowledge of digital mapping using GIS Techniques
4. To acquaint students with analysis of spatial data and attribute data

Topic and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
1	Introduction	i. Definitions of GIS ii. History of GIS iii. Objectives of GIS iv. Components of GIS v. Hardware and Software Requirements vi. Applications of GIS	10
2	Spatial Data	i. Concept of Point, Line and Polygon ii. Digitization iii. Editing iv. Types of geographic data v. Representation of geographic features in vector	12
3	Non-spatial data	i. Attribution ii. Tables and relationships iii. Normalization iv. Manipulation	08

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Understood the techniques of digital mapping
CO 2 : Describe the use of GIS spatial data and techniques
CO 3 : Acquire skills of differentiate the spatial data and non- spatial data
CO 4 : Elaborate the GIS techniques applications in the thematic mapping

References:

1. Burroughs, P. A. and McDonnell, R. A. (2002): Principles of Geographical Information System, Oxford University Press.
2. Clarke, Keith C. (1999) Getting Started with Geographic Information Systems, Prentice Hall, New Jersey
3. DeMers Michel N.(2000): Geographic Information Systems, John Wiley and Sons.
4. George J. (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
5. Jensen, J. R. (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
6. Kang-tsung Chang (2003) Geographic Information Systems, Tata McGraw Hill, New Delhi
7. Lillesand, T. M. and Kiefer R. W. (2002): Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
8. Lo Albert, C.P., and Young, K.W (2003) Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltd., New Delhi.
9. Michael F. Goodchild and Karen K. Kemp (1990) Introduction to GIS, National Center for Geographic Information and Analysis, University of California, Santa Barbara.
10. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
11. Shrikat Karlekar (2014) Geographic Information Systems, Dimand publication, Pune
12. Star J, and J. Estes, (1994), Geographic Information Systems: An Introduction, Prentice Hall, New Jersey.
13. Williams J. (1995): Geographic information from space, John Wiley and Sons, England

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Savitribai Phule Pune University, Pune

B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	II
Name of Vertical Group	**:**	Subject 1
Course Code	**:**	GEO(S) 151-T
Course Title	**:**	Fundamentals to Human Geography
Type of course	**:**	Theory
Total Credits	**:**	02
Workload	**:**	2 credits x 15 hours = 30 hours

Objectives of the Course:

1. To create awareness amongst students regarding the fundamental concepts of Human Geography, including its meaning, nature and scope.
2. To introduced the branches of Human geography
3. To explore different types and patterns of settlement

Topics and Learning Points

Topic No.	Topic Name	Sub Topics	No. of Hours
1.	**Introduction to Human Geography**	i. Meaning and definitions of Human Geography ii. Nature and scope of Human Geography iii. Branches and Importance of Human Geography	08
2.	**Population and Settlement**	i. Factors affecting on distribution of population ii. Composition of Indian Population: Gender and Literacy iii. Theory of Demographic Transition iv. Types and patterns of rural settlement	12
3.	**Agriculture**	i. Types of agriculture (Intensive, Subsistence) ii. Factors affecting Indian agriculture i. Problems of Indian agriculture	12

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Define and explain the meaning, nature and scope of Human Geography.
CO 2 : Discuss the different branches of Human Geography
CO 3 : Elaborate the growth, distribution and composition of population in India
CO 4 : Analyse the types and patterns of rural and urban settlements

References:

1. Chandna, R.C. (2010) Population Geography, Kalyani Publisher.
2. Hassan, M.I. (2005) Population Geography, Rawat Publications, Jaipur
3. Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver and Boyd, London.
4. Musmade Arjun, Sonawane Amit and Jyotiram More, Population & Settlement Geography, (2015), Diamond Publication Pune.
5. Jyotiram More and Musmade Arjun (2015) Regional Geography of India Diamond Publication Pune.
6. Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.
7. Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
8. Kaushik, S.D. (2010) Manavi Bhugol, Rastogi Publication, Meerut.
9. Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan. Allahabad.
10. Sudeepta Adhikari (2016) Orient Blackswan PVT, New Delhi.

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Savitribai Phule Pune University, Pune
B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.SC. (Geography)
Class	**:**	F.Y.B.SC.
Semester	**:**	II
Name of Vertical Group	**:**	Subject 1
Course Code	**:**	GEO(S) 152- P
Course Title	**:**	Practicals in Human Geography
Type of course	**:**	Practical
Total Credits	**:**	02
Workload	**:**	2 credits x 30 hours = 60 hours

Objectives of the Course:

1. To understand the Population Indices and Projection with appropriate examples.
2. To develop their skills for using techniques used in Agriculture Geography.
3. To enable students to use various data visualisation techniques in Human Geography.

Topics and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
1	Population	Population Indices i. Age Sex Pyramid ii. Dependency Ratio iii. Infant Mortality Ratio iv. Population Growth Rate	18
2	Settlement	Measures of Nucleation and Dispersion of Settlement i. Rank Size Rule ii. Types of rural settlements (clustered, linear, dispersed) – sketch and identification iii. Urban settlement patterns – dot & choropleth maps	22
3	Economic	i. Classification of economic activities: Primary, Secondary, Tertiary ii. Weavers crop combination method	20

Course Outcome:

CO 1 : Identify different methods of representation of population indices
CO 2 : Acquire knowledge of Measures of settlements
CO 3 : Calculate and interpret crop combination methods
CO 4 : Understand methods of population and settlement geography

References:

1. Carter Harold (1977): The study of Urban Geography
2. Hans Raj (1978): Fundamentals of Demography
3. Hudson F.S. (1976): Geography of Settlements
4. Michael E. and E. Hurse: Transportation Geography
5. Pollard A. H. and Farhat Yusu: Demographic Techniques
6. Singh, R. L. Reading in Rural Settlement Geography
7. Yeats, M. H. (1974). An introduction to Quantitative Analysis in Human Geography
8. Singh, J. and Dhillon (1984): Agricultural Geography.
9. Liendsor, J. M. (1997): Techniques in Human Geography, Routledge.

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Savitribai Phule Pune University, Pune

B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	II
Name of Vertical Group	**:**	Open Elective (V-4)
Course Code	**:**	OE-103 P-GEO(S)
Course Title	**:**	Practicals in Geography of Rural Development
Type of course	**:**	Practical
Total Credits	**:**	02
Workload	**:**	2 credits x 30 hours = 60 hours

Objectives of the Course:

1. To understand the concept and measures of rural development.
2. To learn the methods and techniques useful for analysis of agricultural and infrastructural development in rural area.
3. To learn the methods and techniques useful for analysis of rural development.
4. To acquire the report writing skills on rural development.

Topics and Learning Points

Topic No.	Topic Name	Sub Topics	No. of Hours
1.	Introduction	a. Measures of rural development b. Importance of practical approaches in rural development	15
2.	Agricultural Development	a. Parameters of agricultural development b. Calculation of Agricultural Development Index	15
3.	Infrastructure Development	a. Parameters of infrastructure development b. Calculation of Infrastructure Development Index	15
4.	Rural Development	a. Parameters of rural developments b. Calculation of Rural Development Index	15

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Learn the practical approaches for rural development.

CO 2 : apply the techniques for analysis of agricultural and infrastructural development in rural area.

CO 3 : Understand methods and techniques for analysis of rural development.

CO 4 : Acquire the skills of case study and report writing on rural development.

References:

1. Narton R.D., Agricultural Development Policy: Concepts and Experiences.
2. Quaraishi, M. A., Indian Agriculture and Rural Development.
3. Vasanth Desai, Rural Development, Vol.-I toV.
4. Brahmananda, et al., Dimensions of Rural Development in India,
5. Satyasundaram (1997), Rural Development, Himalaya Publishing House, New Delhi.
6. Katar Sing (1986), Rural Development, Principles, Policies, and Management, Sage publication, New Delhi
7. Kalipada Deb (1997), The challenge of Rural Development, M.D. Publications Pvt. Ltd., New Delhi.
8. T.P Gopal Swamy, Rural Marketing.
9. William J. Goode and Paul K (1988). Methods in Social Research Young (Mauline, V) Scientific Social Surveys and Research Prentice Hall, New Delhi.
10. Johl S. S. and Kapur T. R. (1977), Fundamentals of Farm Business Management, Kalyani Publishers, Ludhiana (Punjab).

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B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	II
Name of Vertical Group	**:**	OE
Course Code	**:**	OE 152 P GEO(S)
Course Title	**:**	Practical in Agriculture Geography
Type of course	**:**	Practical
Total Credits	**:**	02
Workload	**:**	2 credits x 30 hours = 60 hours

Objectives of the Course:

1. To introduce students with the concept and practice of agricultural techniques.
2. To teach them various GIS techniques.
3. To make them aware about the importance of such techniques for agricultural planning.
4. To inform them about the uses for this type of agribusiness.

Topics and Learning Points

Topic No.	Topic Name	Sub Topics	No. of Hours
1	Crop Distribution and Patterns	i. Sources of agricultural data: Census, Agriculture Department, Statistical Abstracts ii. Identification of cropping seasons: Kharif, Rabi iii. Mapping of crop distribution (dot map/pie diagram) iv. Crop calendar preparation v. Introduction to symbols used in agricultural mapping	20
2	Agro-climatic zones	i. Identification of major agricultural regions in India ii. Simple mapping of agro-climatic zones of Maharashtra iii. Chart preparation on agricultural problems: soil erosion, water scarcity, low yield	20
2	Cost benefit analysis	Parameters of Cost benefit analysis i. Production cost ii. Transportation cost iii. Selling prize iv. Net benefit Cost benefit analysis of following crops i. Sugarcane ii.Onion iii.Grapes	20

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Apply the techniques in advanced agriculture geography
CO 2 : Analyse the crop combination using appropriate method.
CO 3 : Evaluate findings of agricultural analysis effectively.
CO 4 : Determine cost benefit of major crops

References:

1. Khan, M. Z. A. (1998). Text Book of Practical Geography. Concept Publishing Company.
2. Khang, A. (Ed.). (2023). Handbook of Research on AI-equipped IoT Applications in High-tech Agriculture. IGI Global.
3. Lu, D. (2024). Regional development and its spatial structure. Springer.
4. Newbury, P. A. (1980). A geography of agriculture. Macdonald and Evans Ltd.
5. Thaer, A. D. (2023). The principles of practical agriculture. BoD–Books on Demand.
6. Vink, A. P. A. (2013). Land use in advancing agriculture (Vol. 1). Springer Science & Business Media.

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B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc.
Semester	**:**	II
Name of Vertical Group	**:**	SEC
Course Code	**:**	SEC 151-P GEO(S)
Course Title	**:**	Practicals in Cartographic Techniques
Type of course	**:**	Practical
Total Credits	**:**	02
Workload	**:**	2 credits x 30 hours = 60 hours

Objectives of the Course:

1. To understand the principles and historical development of cartography and its evolution over time.
2. To introduce the students with the fundamental concepts and techniques of cartography.
3. To enable students to use various data visualisation techniques in Cartography.
4. To recognize the importance of cartography in various fields and applications.

Topics and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
1	Map Scale	i. Definition of Map Scale ii. Types of Map Scale a. Verbal scale b. Representative fraction c. Graphical scale iii. Conversion of Scale (British and Metric System) d. Verbal scale into Representative fraction e. Representative fraction into Verbal scale iv. Construction of Simple Graphical scale (At least one example from Metric System).	24
2	Time Measurements	i. Local Time ii. Standard time iii. International Time iv. Identification of time on various longitude with reference to Greenwich time (Give examples)	18

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Recognize the key terminologies and principles associated with cartography.

CO 2 : Describe the major technological advancements in cartographic techniques over time.

CO 3 : Develop skills needed to create meaningful maps and data visualisations, enhancing their ability to convey information and represent geographical data.

References:

1. Cuff J. D. and Mattson M. T., (1982), Thematic Maps: Their Design and Production, Methuen Young Books.
2. Dent B. D., Torguson J. S., and Holder T. W., (2008) Cartography: Thematic Map Design (6th Edition), Mcgraw-Hill Higher Education
3. Gupta K. K. and Tyagi V. C., (1992), Working with Maps, Survey of India, DST, New Delhi.
4. Kraak M. J. and Ormeling F., (2003), Cartography: Visualization of Geo-Spatial Data, Prentice-Hall.
5. Mishra R. P. and Ramesh A., (1989), Fundamentals of Cartography, Concept, New Delhi.
6. Sharma J. P., (2010), Prayogic Bhugol, Rastogi Publishers, Meerut.
7. Singh R. L. and Singh R. P. B., (1999), Elements of Practical Geography, Kalyani Publishers.
8. Slocum T. A., Mcmaster R. B. and Kessler F. C., (2008), Thematic Cartography and Geo visualization (3rd Edition), Prentice Hall.
9. Tyner J. A., (2010), Principles of Map Design, The Guilford Press.
10. Sarkar, A., (2015), Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
11. Singh, L. R. and Singh, R., (1977), Manchitra or Pryaogatamek Bhugol , Central Book, Depot, Allahabad
12. Bhopal Singh, R. L., and Dutta, P. K., (2012), Prayogatama Bhugol, Central Book Depot, Allahabad.

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B.Sc. (Geography) as per NEP 2020

Name of the Programme	**:**	B.Sc. (Geography)
Class	**:**	F.Y.B.Sc .
Semester	**:**	II
Name of Vertical Group	**:**	SEC (V-5)
Course Code	**:**	SEC-152-P GEO(S)
Course Title	**:**	Practical in Digital Mapping
Type of course	**:**	Practical
Total Credits	**:**	02
Workload	**:**	2 credits x 30 hours = 60 hours

Objectives of the Course:

1. To introduce the students to the use of GIS software
2. To enable students with basic map layout and GIS data
3. To enhance the students' knowledge of digital mapping using GIS Techniques
4. To acquaint students with analysis of spatial data and attribute data

Topic and Learning Points

Topic No	Topic Name	Sub Topic	No. of Hours
1	Introduction	1. Overview of Open-source software Q-GIS / SAGA or any GIS software 2. Geo-referencing	08
2	Non - Spatial Data	1. Attribute Data : 2. Tables, Queries on Tables, 3. Use of MS-Excel and MS Access	16
3	Spatial Data and its Analysis	1. Creation of Vector Layers : Point, Line, Polygon 2. On-Screen Digitization 3. Editing, Topology Creation, Line and Area Measurements 4. Data Attribution	36

Course Outcome:

By the end of this course, student will be able to:

CO 1 : Understood the techniques of digital mapping
CO 2 : Use the GIS software in preparation of digital maps
CO 3 : Acquire skills of spatial analysis, topology building and data attribution
CO 4 : Apply the GIS software for performing query analysis and thematic mapping

References:

1. Burroughs, P. A. and McDonnell, R. A. (2002): Principles of Geographical Information System, Oxford University Press.
2. Clarke, Keith C. (1999) Getting Started with Geographic Information Systems, Prentice Hall, New Jersey
3. DeMers Michel N.(2000): Geographic Information Systems, John Wiley and Sons.
4. George J. (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
5. Jensen, J. R. (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
6. Kang-tsung Chang (2003) Geographic Information Systems, Tata McGraw Hill, New Delhi
7. Lillesand, T. M. and Kiefer R. W. (2002): Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
8. Lo Albert, C.P., and Young, K.W (2003) Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltd., New Delhi.
9. Michael F. Goodchild and Karen K. Kemp (1990) Introduction to GIS, National Center for Geographic Information and Analysis, University of California, Santa Barbara.
10. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
11. Shrikat Karlekar (2014) Geographic Information Systems, dimand publication, Pune
12. Star J, and J. Estes, (1994), Geographic Information Systems: An Introduction, Prentice Hall, New Jersey.
13. Williams J. (1995): Geographic information from space, John Wiley and Sons, England

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