



Anekant Education Society's
Tuljaram Chaturchand College, Baramati.
(Autonomous)

Three Year B. Voc. Degree Program in Dairy Technology
(Faculty of Vocational Courses)

CBCS Syllabus
F. Y. B. Voc. Dairy Technology
Semester - I
For Department of
Dairy Technology
Tuljaram Chaturchand College, Baramati

Choice Based Credit System Syllabus (2023 Pattern)
(As Per NEP 2020)

To be implemented from Academic Year 2023-2024

Title of the Programme: F. Y. B. Voc. (Dairy Technology)**Preamble**

AES's Tuljaram Chaturchand College has made the decision to change the syllabus of across various faculties from June, 2023 by incorporating the guidelines and provisions outlined in the National Education Policy (NEP), 2020. The NEP envisions making education more holistic and effective and to lay emphasis on the integration of general (academic) education, vocational education and experiential learning. The NEP introduces holistic and multidisciplinary education that would help to develop intellectual, scientific, social, physical, emotional, ethical and moral capacities of the students. The NEP 2020 envisages flexible curricular structures and learning based outcome approach for the development of the students. By establishing a nationally accepted and internationally comparable credit structure and courses framework, the NEP 2020 aims to promote educational excellence, facilitate seamless academic mobility, and enhance the global competitiveness of Indian students. It fosters a system where educational achievements can be recognized and valued not only within the country but also in the international arena, expanding opportunities and opening doors for students to pursue their aspirations on a global scale.

In response to the rapid advancements in science and technology and the evolving approaches in various domains of Dairy sector and related subjects, the Board of Studies in Dairy Technology at Tuljaram Chaturchand College, Baramati - Pune, has developed the curriculum for the first semester of F. Y. B. Voc. Dairy Technology, which goes beyond traditional academic boundaries. The syllabus is aligned with the NEP 2020 guidelines to ensure that students receive an education that prepares them for the challenges and opportunities of the 21st century. This syllabus has been designed under the framework of the Choice Based Credit System (CBCS), taking into consideration the guidelines set forth by the National Education Policy (NEP) 2020, LOCF (UGC), NCrF, NHEQF, Prof. R. D. Kulkarni's Report, Government of Maharashtra's General Resolution dated 20th April and 16th May 2023, and the Circular issued by SPPU, Pune on 31st May 2023.

The department of Dairy technology aims at imparting quality education in the realm of procurement, processing and packaging of milk and milk products with an objective to enhance and expand the knowledge and skill set of target students so that they can contribute in the betterment of society at large. The department of Dairy Technology was established with the objective of producing highly proficient technocrats who can meet the standards of the corporate. The department purports to have dexterous mentors adept at molding the student talent pool. A team of well qualified faculty navigates issuing priceless guidance and tapping the potential of students.

It is estimated that a huge number of Dairy Technology professionals will be required in India five years down the line in keeping with the global trend. Indian professionals are respected across the world

for their technology – related skills. Our focus in this department is not only on completing the curriculum to pass the examinations but we also try to keep up with the developments in the technology and expose the students to the latest to ensure that they are able to cope up with the fast changing industrial scenario.

The department is in purpose – built accommodation and is equipped with teaching and office space as well as well equipped laboratories for practical - based teaching. All faculties of the department are members of various professional societies and technical bodies like AFST (I), etc. the department has signed MoU's with various organizations for student exchange and projects.

Overall, revising the Dairy Technology syllabus in accordance with the NEP 2020 ensures that students receive an education that is relevant, comprehensive, and prepares them to navigate the dynamic and interconnected world of today. It equips them with the knowledge, skills, and competencies needed to contribute meaningfully to society and pursue their academic and professional goals in a rapidly changing global landscape.

Programme Specific Outcomes (PSOs)

- PSO1. Problem Analysis:** Demonstrate the ability to analyze physical and cultural problems in both rural and urban environments and propose effective solutions.
- PSO2. Socio-economic Survey Project:** Possess the skills necessary to conduct socio-economic survey projects, enabling them to assess the development status of specific social groups or sections of society.
- PSO3. Individual and Teamwork:** Effectively collaborate as individuals and as members or leaders in diverse teams and multidisciplinary settings.
- PSO4. Application of Modern Instruments:** Apply various modern instruments for data collection and field surveys.
- PSO5. GIS and Geographical Map Making:** Learn to utilize GIS and modern techniques for creating geographically-based maps.
- PSO6. Critical Thinking:** Demonstrate the ability to understand and address critical issues in physical and cultural environments.
- PSO7. Development of Observation Skills:** Through field experiences, students will develop strong observational skills and the ability to identify socio-environmental problems in localities.
- PSO8. Human perception and behaviour:** Learning human perception and behaviour to acquire the geographical knowledge over time, is essential to improve decision-making process.
- PSO9. Effective Citizenship:** Exhibit empathetic social concern, an equity-centered approach to national development, and actively engage in civic life through volunteering.
- PSO10. Management Skills:** Understand and apply management principles to their work, functioning effectively as individuals and as members or leaders in diverse, multidisciplinary teams.
- PSO11 Ethics:** Recognize different value systems, including their own, understand the moral dimensions of their decisions, and take responsibility for their actions.
- PSO12. Environmental Ethics and Sustainability:** Comprehend the societal and environmental impact of their knowledge and exhibit an understanding of the need for sustainable development.
- PSO13. Identification of critical problems and issues:** Detection and identification of the critical problems and spatial issues are essential for sustainable development.

Anekant Education Society's
Tuljaram Chaturchand College, Baramati
(Autonomous)

Board of Studies (BOS) in Dairy Technology

From 2022-23 to 2024-25

Sr.No.	Name	Designation
1.	Ms. Patwardhan Shubhada S.	Chairman
2.	Ms. More Nikita Baban	Member
3.	Ms. KhomaneVaishnavi B.	Member
4.	Ms. Pranoti Anagal	Expert from University
5.	Dr. Khojare Ajit S.	Expert from otherUniversity
6.	Dr. Sahoo A. K.	Expert from otherUniversity
7.	Mr. Chavan Ganesh	IndustryExpert
8.	Mr. Vhorkate Karan Dayaram	MeritoriousAlumni
9.	Ms. Taware Shravani Rajesh	Student Representative
10.	Mr. Gavali Saurabh Anil	Student Representative

Credit Distribution Structure for F. Y. B. Voc. – 2023 – 2024 (Dairy Technology)

Level	Semester	Major		Minor	OE	VSC,SEC,(VSEC)	AEC,VEC,IKS	OJT, FP,CEP, CC,RP	Cum. Cr/Sem	Degree/Cum.Cr.
		Mandatory	Electives							
4.5	I	DRT-101-MJM: Dairy Farm Management (2credits)	-	--	DRT -116 – OE (T): Diet Management (2credits)	DRT -121-VSC: Waste management and effluent treatment (2 credits)	ENG-131-AEC Functional English-I(2credit)	CC1 (2credit)	22	UG Certificate 44credits
		DRT -102-MJM: Dairy Chemistry (2credits)	-			DRT -117- OE (P): Diet Planning (2 credits)				
		DRT -103-MJM (P): Chemical analysis of milk (2credits)	-		DRT -137-IKS: Ancient Indian Dairy Technology (2credits)					
	II	DRT -151-MJM: Market milk (2 credits)	-	DRT -161-MN: Food Preservation Technology	DRT -116-OE: Food adulteration (2credits)	DRT -171-VSC: Water Analysis (2 credits)	ENG-181-AEC Functional English-II(2credit)	CC2 (2 credit)	22	
DRT -152-	-	DRT -176-SEC	COS-185-VEC:							

	MJM: Dairy Microbiology (2 credits)		(2credits)	DRT -117- OE: Detection of Food Adulteration (2 credits)	Computer skills (2credits)	Digital and Technological Solutions			
	DRT -152- MJM: Practical Microbial analysis of milk (2 credits)								
Cu m Cr.	12	- -	2	8	8	10	4	44	

Course Structure for F. Y. B. Voc. Dairy Technology (2023 Pattern)

Sem	CourseType	Course Code	Course Name	Theory /Practical	Credits
I	Major Mandatory	DRT-101-MJM	Dairy Farm Management	Theory	02
	Major Mandatory	DRT-102-MJM	Dairy Chemistry	Theory	02
	Major Mandatory	DRT-103-MJM	Chemical analysis of milk	Practical	02
	Open Elective(OE)	DRT-116-OE	Diet Management	Theory	02
	Open Elective(OE)	DRT-117-OE	Diet Planning	Theory	02
	Vocational Skill Course (VSC)	DRT-121-VSC	Waste management and Effluent treatment	Theory	02
	Skill Enhancement Course (SEC)	DRT-126-SEC	Soft skill development	Theory	02
	Ability Enhancement Course (AEC)	ENG-131-AEC	Functional English-I	Theory	02
	Value Education Course (VEC)	ENV-135-VEC	Environmental Science	Theory	02
	Indian Knowledge System (IKS)	DRT-137-IKS	Ancient Indian Dairy Technology	Theory	02
	Co-curricular Course(CC)	--	To be selected from the Basket	Theory	02
Total Credits Semester - I					22
II	Major Mandatory	DRT-151-MJM	Market milk	Theory	02
	Major Mandatory	DRT-152-MJM	Dairy Microbiology	Theory	02
	Major Mandatory	DRT-153-MJM	Microbial analysis of milk	Practical	02
	Minor	DRT-161-MN	Food Preservation Technology	Theory	02
	Open Elective(OE)	DRT-166-OE	Food adulteration	Theory	02
	Open Elective(OE)	DRT-167-OE	Detection of Food Adulteration	Theory	02
	Vocational Skill Course (VSC)	DRT-171-VSC	Water Analysis	Theory	02
	Skill Enhancement Course (SEC)	DRT-176-SEC	Computer skills	Theory	02
	Ability Enhancement Course (AEC)	ENG-181-AEC	Functional English-II	Theory	02
	Value Education Course (VEC)	COS-185-VEC	Digital and Technological Solutions	Theory	02
	Co-curricular Course (CC)	--	To be selected from the Basket	Theory	02
Total Credits Semester II					22
Cumulative Credits Semester I and II					44

**CBCS Syllabus as per NEP 2020 for F.Y.B.A
Geography(2023 Pattern)****Name of the Programme:** B.A. Geography**Programme Code** : UAGEO**Class** : F.Y.B.A.**Semester** I**Course Type** : Major Mandatory**Course Code** : GEO-101-MJM**Course Title** : Physical Geography**No. of Credits** 04**No. of Teaching Hours** 60**Course Objectives:**

1. To describe the components of the Earth System.
2. To understand the Plate Tectonic Theory and associated features.
3. To study the distribution of major landforms of the Earth.
4. To know the process of weathering and soil formation process.
5. To understand the role of hydrological cycle in the earth system.
6. To explain the factors influencing the formation of ocean currents.
7. To identify and study local landforms and weather features.

Course Outcomes:**By the end of the course, students will be able to:**

- CO1.** Identify and describe the characteristics and functions of each component within the Earth System.
- CO2.** Explain the processes and features associated with plate tectonics, such as divergent boundaries, convergent boundaries, transform boundaries, and associated geological phenomena
- CO3.** Identify and classify major landforms on Earth, including mountains, plains, plateaus, valleys, and deserts.
- CO4.** Explain the stages and factors involved in soil formation, including parent material, climate, organisms, topography, and time.
- CO5.** Understand the role of the hydrological cycle in redistributing water on Earth and

maintaining global water balance.

CO6. Analyze the role of ocean currents in global climate patterns, marine ecosystems, and the transport of heat around the Earth.

CO7. Observe and analyze local weather features, including cloud formations, wind patterns, and precipitation, and understand their causes and implications.

Topics and Learning Points

UNIT1: Introduction to Physical Geography	Teaching Hours
Definition, nature and scope	12
Components of Earth System	
Branches of Physical Geography	
Importance of Physical Geography	
UNIT2: Lithosphere	12
Internal structure of the Earth	
Plate Tectonic Theory	
Major landforms	
Weathering and soil formation	
UNIT3: Atmosphere	12
Structure and composition of atmosphere	
Heat balance and global wind circulation pattern	
Tropical cyclones	
Monsoon	
UNIT4: Hydrosphere	12
Hydrological cycle	
Ocean bottom relief features	
Tides and ocean currents	
Major oceans and seas	
UNIT5: Applicability of Physical Geography	12
Urban planning and land use	
Natural hazard assessment and mitigation	
Water resource management	
Tourism and recreation planning	

References:

1. Clyton K.,(1986),Earth Crust,AdusBook, London.
2. Davis W.M.,(1909),Geographical Essay,Ginnia Co.
3. Dayal P.,(1996),Text Book of Geomorphology,Shukla Book Depot,Patna.
4. Kale V.S.and Gupta A.,(2015),Introduction of Geomorphology,University Press,PVT Kolkata.
5. Lal,D.S.(1998):'Climatology',Chaitanya Publishing House,Allahabad
6. Kale V.S.and Gupta A.,(2001),Elements of Geomorphology, Oxford Univ.Press.
7. Monkhouse,(1951), Principle of Physical Geography,McGraw Hill Pub–New York.
8. Pitty A. F.,(1974),Introduction to Geomorphology,Methuen London.
9. Singh Savindra, (2000),Physical Geography,Prayag Pustak Bhavan, 20-A,University Road,Allahabad – 211002.
10. Steers J.A.,(1964),The Unstable Earth Some Recent Views in Geography,Kalyani Publishers,New Delhi.
11. Swaroop Shanti,(2006), Physical Geography,King Books,Nai Sarak,Delhi–110006.
12. Wooldridge S.W.and Morgan R.S.,(1959),The Physical Basis of Geography and Outline of Geomorphology,Longman Green and Co.London.
13. Chaudhari J.L.(2013)Physical Geography

CBCS Syllabus as per NEP 2020 for F.Y.B.A Geography (2023 Pattern)

Name of the Programme: B.A. Geography

Programme Code : UAGEO

Class : F.Y.B.A.

Semester : I

Course Type : Major Mandatory

Course Code : GEO-102-MJM

Course Title : Practical in Physical Geography

No. of Credits : 02

No. of Teaching Hours : 60

Course Objectives:

1. To describe the components of the Earth System.
2. To understand the Plate Tectonic Theory and associated features.
3. To study the distribution of major landforms of the Earth.
4. To know the process of weathering and soil formation process.
5. To understand the role of hydrological cycle in the earth system.
6. To explain the factors influencing the formation of ocean currents.
7. To identify and study local landforms and weather features.

Course Outcomes:

By the end of the course, students will be able to:

- CO1.** Identify and describe the characteristics and functions of each component within the Earth System.
- CO2.** Explain the processes and features associated with plate tectonics, such as divergent boundaries, convergent boundaries, transform boundaries, and associated geological phenomena
- CO3.** Identify and classify major landforms on Earth, including mountains, plains, plateaus, valleys, and deserts.
- CO4.** Explain the stages and factors involved in soil formation, including parent material, climate, organisms, topography, and time.
- CO5.** Understand the role of the hydrological cycle in redistributing water on Earth and

maintaining global water balance.

CO6. Analyze the role of ocean currents in global climate patterns, marine ecosystems, and the transport of heat around the Earth.

CO7. Observe and analyze local weather features, including cloud formations, wind patterns, and precipitation, and understand their causes and implications.

Topics and Learning Points

UNIT 1: Map reading and Interpretation	Teaching Hours
Introduction to Topographical Maps	20
Identification and drawing of relief features from the topographic sheet	
Measurement of area, distance, direction and elevation	
Interpretation of topographical maps	
UNIT 2: Weather instruments and measurement	20
Handling and operation of weather instruments	
Measurement of temperature, atmospheric pressure, humidity, and wind speed	
Recording and interpretation of weather data	
UNIT 3: Field visit and study of landforms and geomorphic processes	20
Field visit to observe and study landforms	
Identification and description of geomorphic processes that have shaped the landscape	
Writing a field visit report	

References:

1. Clayton K., (1986), Earth Crust, Adus Book, London.
2. Davis W.M., (1909), Geographical Essay, Ginnia Co.
3. Dayal P., (1996), Text Book of Geomorphology, Shukla Book Depot, Patna.
4. Kale V.S. and Gupta A., (2015), Introduction of Geomorphology, University Press, PVT Kol kata.
5. Lal, D.S. (1998): 'Climatology', Chaitanya Publishing House, Allahabad
6. Kale V.S. and Gupta A., (2001), Elements of Geomorphology, Oxford Univ. Press.
7. Monkhouse, (1951), Principle of Physical Geography, McGraw Hill Pub–New York.

8. Pitty A. F., (1974), Introduction to Geomorphology, Methuen London.
9. Singh Savindra, (2000), Physical Geography, Prayag Pustak Bhavan, 20-A, University Road, Allahabad – 211002.
10. Steers J.A., (1964), The Unstable Earth Some Recent Views in Geography, Kalyani Publishers, New Delhi.
11. Swaroop Shanti, (2006), Physical Geography, King Books, Nai Sarak, Delhi – 110006.
12. Wooldridge S.W. and Morgan R.S., (1959), The Physical Basis of Geography and Outline of Geomorphology, Longman Green and Co. London.
13. Chaudhari J.L. (2013) Physical Geography

**CBCS Syllabus as per NEP 2020 for F.Y.B.A
Geography(2023 Pattern)****Name of the Programme:** FYBA Geography**Programme Code** : UAGEO**Class** : FYBA**Semester** I**Course Type** : Open Elective (OE)**Course Code** : GEO-116-OE**Course Title** : Principles of Remote Sensing-I**No. of Credits** 02**No. of Teaching Hours** 30**Course Objectives:**

1. To understand the field of remote sensing.
2. To provide understanding of fundamentals of remote sensing and their applications.
3. To provide detail understanding of sensors and platforms.
4. To provide understanding of platform and its types.
5. To understand the role of platform in data acquisition.
6. To prepare skilled manpower to fulfill the dream of Digital India.
7. To encourage research and development in the field of remote sensing and GIS.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand about basic concepts in remote sensing.
CO2. Identify the types of satellite.
CO3. Recognize importance of sensor in data collection.
CO4. Get knowledge of platform in acquiring data.
CO5. Familiar and interact with EMR in environment.
CO6. Can do the image processing.
CO7. Develop an idea about satellite image interpretation.

Topics and Learning Points

UNIT 1: Introduction to Remote Sensing	Teaching Hours
<ol style="list-style-type: none"> 1. Remote Sensing: definition, concept 2. Principles of Remote Sensing 3. History of Remote Sensing 4. Development of Remote Sensing in India 	10
UNIT 2: EMR and EMS	10
<ol style="list-style-type: none"> 1. EM Radiation, EM Spectrum, Spectral Signature 2. Interaction of EMR with atmosphere 3. Interaction of EMR with Earth's surface 4. Blackbody radiation, Laws of radiation 	
UNIT 3: Platforms and Sensor	10
<ol style="list-style-type: none"> 1. Platform: Types and characteristics 2. Satellites: Geo-stationary and Sun-synchronous 3. Sensors: Concept and Basic Principles 4. Types of Sensors: Across-track (whiskbroom) and Along-track (pushbroom) scanning 	

References:

1. Anji Reddy, M. (2004): Geoinformatics for environmental management. B. S. Publications
2. Campbell, J.B. (2002): Introduction to remote sensing. Taylor Publications.
3. Chang, T.K. (2002): Geographic Information Systems. Tata McGraw Hill
4. Drury, S.A. (1987): Image Interpretation in Geology. Allen and Unwin.
5. Francis Tar Bernhardsen. Geographical Information Systems. John Wiley.
6. Gupta, R.P. (1990): Remote Sensing Geology. Springer Verlag.
7. Heywood, I., Cornelius, S., Crver, Steve. (2003): An Introduction to Geographical Information Systems. Pearson Education
8. Jensen, J.R. (2000): RS of the Environment: An Earth resource Perspective Prentice Hall.
9. Joseph George (2003): Fundamentals of remote sensing. Universities Press.

**CBCS Syllabus as per NEP 2020 for F.Y.B.A
Geography(2023 Pattern)****Name of the Programme:** FYBA Geography**Programme Code** : UAGEO**Class** : FYBA**Semester** I**Course Type** : Open Elective (OE)**Course Code** : GEO-117-OE**Course Title** : Principles of Geoinformatics-I**No. of Credits** 02**No. of Teaching Hours** 30**Course Objectives:**

1. To introduce the fundamentals of Geographical Information System.
2. To understand the historical development of GIS
3. To know the database and its types.
4. To prepare for the practical work with GIS System.
5. To understand the database model used in GIS
6. To introduce the principles of digitization and its merits and demerits.
7. To create a map layout by digitization process.

Course Outcomes:**By the end of the course, students will be able to:****CO1.** Realize basic concepts in Geoinformatics.**CO2.** Understand historical development of GIS**CO3.** Analyse types of databases and their applications.**CO4.** Carry out practical work in GIS Software's.**CO5.** Familiar with basic principles in digitization process.**CO6.** Handling database models used in GIS.**CO7.** Create thematic maps and location maps of study area

Topics and Learning Points

UNIT1: Introduction to GIS	Teaching Hours
Definition, potential of GIS, concept of space & time	10
Spatial Information Theory	
History of GIS	
Objectives of GIS	
Elements of GIS, hardware & software requirements	
UNIT2: Database and data model	10
Spatial: spatial relationship, functional relationship, logical relationship	
Non-spatial: nominal, ordinal, ratio and cyclic	
Spatial model: Geometric primitives, Raster, Vector	
Non-spatial model: DBMS, hierarchical, network and relational	
UNIT3: Structuring of Spatial Data	10
Digitization: Meaning and concept	
Merits and demerits in digitization	
Types of Digitizers: manual, semi-automatic & automatic	
Editing error: detection & correction, topology building	

References:

1. Burroughs, P. A. and McDonnell, R. A. (2002): Principles of Geographical Information System, Oxford University Press.
2. George J. (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
3. Jensen, J.R. (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
4. Kang- Tsung-Chang, Introduction to Geographical Information System, 2002, McGraw Hill.
5. Lillesand, T.M. and Kiefer R. W. (2002): Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
6. Lo C.P. and Yeung, A.K.W. (2002): Concepts and Techniques of Geographic Information System, Prentice Hall, India.

**CBCS Syllabus as per NEP 2020 for F.Y.B.A
Geography (2023 Pattern)****Name of the Programme:** FYBA Geography**Programme Code** : UAGEO**Class** : FYBA**Semester** : I**Course Type** : Vocational Skill Course (VSC)**Course Code** : GEO-121-VSC**Course Title** : Land Surveying and Measurement**No. of Credits** : 02**No. of Teaching Hours** : 30**Course Objectives:**

1. This course develops cartographic and surveying knowledge of students.
2. This course gives adequate knowledge of plane table survey to measure area.
3. To enable the student to use various techniques of calculating area.
4. To familiarize the students with GPS survey and plotting on graph paper.
5. To acquaint the students with various skills of land surveying.
6. To explain the students for converting area in different units.
7. To inform the students with different shapes of land measurement.

Course Outcomes:**By the end of the course, students will be able to:****CO1.** Understand concept of cartography and its development.**CO2.** Represent data by using cartographic techniques.**CO3.** Aware about basics of surveying.**CO4.** Conduct plane table survey and measure any type of land.**CO5.** Take coordinate point using GPS and they can able to plot this point on paper to make map of surveying area.**CO6.** Measure area of any shape of land.**CO7.** Measure and convert an area in different measurement.

Topics and Learning Points

UNIT 1: Introduction to Surveying and Plane Table Survey	Teaching Hours
Definition of Surveying	10
Types of North Direction (True, Magnetic and Grid North)	
Types of Survey	
Plane Table Survey:	
a) Radiation Method	b) Intersection Method
UNIT 2: GPSSurvey	10
Introduction and handling techniques of GPS	
Types of GPS	
Conducting GPS point with Latitude, Longitude and Altitude	
Plotting techniques GPS point on graph paper and measurement of area	
UNIT 3: Techniques of land measurement	10
Actual land measurement using above two instruments of surveying	
Measurement of area (Circle, Square, Rectangle, Triangle, Uneven shape)	
concepts of Guntha (R), Ekar, Hecto and Square Kilometer	
Conversion of area (R into Ekar, hecto into Ekar, Square km into square meter, Square meter to square feet)	

References:

1. Sharma J.P., 2010, Prayogic Bhugol, Rastogi Publishers, Meerut.
2. Singh R.L. and Singh R. P. B., 1999, Elements of Practical Geography, Kalyani Publishers.
3. Slocum T.A., McMaster R.B. and Kessler F.C., 2008, Thematic Cartography and Geovisualization (3rd Edition), Prentice Hall.
4. Tyner J.A., 2010, Principles of Map Design, The Guilford Press.
5. Sarkar A., 2015, Practical Geography: A Systematic Approach, Orient Black Swan Private Ltd., New Delhi
6. Singh R.L. and Dutta P.K., 2012, Prayogatama Bhugol, Central Book Depot, Allahabad

7. Ahirrao Y., Karanjkele E.K., 2002, Practical Geography, Sudarshan Publication, Nashik
8. Saptarshi P.G., Jog S.R., Statistical Methods
9. Karlekar S.N., 2008, Statistical Methods, Diamond Publication, Pune
10. Kanetkar T.P., Kulkarni S.
V., 1986, Surveying and Leveling, Pune Vidyrthi Griha Publication, Pune
11. Kumbhare A., Practical Geography, Sumeru Publication, Dombivli.
12. Saha P., Basu P., 2007, Advanced Practical Geography, Books and Allied (P) Ltd, Kolkata
13. Saha P., Basu P., Advanced Practical Geography: 2007, Books and Allied (P) Ltd, Kolkata
14. V.J. Patil and A.P. Chaudhari, 2016 Pratyakshik Bhugol, Prashant Publication

CBCS Syllabus as per NEP 2020 for F.Y.B.A Geography(2023 Pattern)

Name of the Programme: FYBA Geography

Programme Code : UAGEO

Class : FYBA

Semester : I

Course Type : Skill Enhancement Course (SEC)

Course Code : GEO-126-SEC

Course Title : Fundamentals of Google Earth

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

1. To provide an introduction to the Google Earth Pro software.
2. To study capabilities for spatial data visualization, analysis, and communication.
3. To learn how to navigate and customize Google Earth Pro.
4. To study import and manage geographic data.
5. To learn to create and edit placemarks, polygons, paths, and images.
6. To measure distances and areas, perform spatial queries and analysis.
7. To share and export data.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Navigate and customize the Google Earth Pro interface and preferences.

CO2. Import and manage geographic data in different

formats. **CO3.** Create and edit placemarks, polygons, paths, and images. **CO4.** Add attributes and labels to geographic features.

CO5. Use measurement and annotation tools to perform spatial analysis and querying.

CO6. Share and export maps and data in different formats.

CO7. Apply this knowledge in any field and applications.

Topics and Learning Points

UNIT 1: Introduction to Google Earth	Teaching Hours
1. Overview of Google Earth Pro interface and tools	10
2. Customizing the Google Earth Pro preferences	
3. Navigation and view controls in Google Earth Pro	
UNIT 2: Data Import and Management	10
1. Importing and exporting data in different formats	
2. Creating and managing folders, layers, and projects	
3. Managing and editing data attributes and metadata	
UNIT 3: Creating and Editing Geographic Features	10
1. Creating and editing placemarks, polygons, paths, and images	
2. Adding and editing attributes and labels to geographic features	
3. Using measurement and annotation tools in Google Earth Pro	

References:

1. Battersby, S.E., and Finn, M.P. (2018). Mapping and Visualization with SuperCollider. Springer.
2. Brown, M. (2014). Google Maps: Power Tools for Maximizing the API. McGraw Hill Professional.
3. Joly, D., and Gaffuri, J. (2016). Web Mapping Illustrated: Using Open Source GIS Toolkits. O'Reilly Media.
4. Kohler, A., and Gow, J. (2018). Using Google Earth in Geography Classrooms: A Collection of Lessons and Ideas. Springer.
5. Roth, R.E., and Krum, K. (2013). Google Maps API. Apress.
6. Google Earth Help Center: <https://support.google.com/earth/?hl=en#topic=4386911>
7. Google Earth User Guide: <https://support.google.com/earth/answer/21955>
8. Google Earth Outreach: <https://www.google.com/earth/outreach/>
9. Google Earth Blog: <https://www.gearthblog.com/>

10. Google Earth Community: <https://support.google.com/earth/community?hl=en>
11. Google Earth Education: <https://www.google.com/earth/education/>
12. GIS Geography: <https://gisgeography.com/google-earth-pro-tutorial/>
13. KML Tutorial: https://developers.google.com/kml/documentation/kml_tut
14. EarthPoint: <https://www.earthpoint.us/>
15. Google Earth Studio: <https://www.google.com/earth/studio/>

CBCS Syllabus as per NEP 2020 for F.Y.B.A Geography (2023 Pattern)

Name of the Programme: FYBA Geography

Programme Code : UAGEO

Class : FYBA

Semester : I

Course Type : Value Education Course (VEC)

Course Code : GEO-135-VEC

Course Title : Environmental Pollution and Value Education

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

1. To create the awareness about dynamic environment among the student.
2. To acquaint the students with fundamental concepts of environment for development in different areas.
3. The students should be able to integrate various factors of Environment and dynamic aspect of Environment.
4. To make aware the students about the problems of environment, their utilization and conservation in the view of sustainable development.
5. To make conscious about environment pollution.
6. To utilize different ideas to reduce environment pollution.
7. To accept value education about environment.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand concept of environment and its development.

CO2. Identify biodiversity, ecosystem of environment.

CO3. Well recognize types and importance of environment.

CO4. Identify solution to control or reduce environmental pollution.

CO5. Understand of value of environment.

CO6. Awareness among society to improve knowledge about environment.

CO7. Analyse and prepare a plan to reduce environment pollution.

Topics and Learning Points

UNIT1: Introduction to Environmental Geography	Teaching Hours
Definition, Nature and scope of Environmental Geography.	10
Types of Environments	
Importance of Environmental Geography	
Approaches to study of environmental Geography	
UNIT2: Environmental Pollution	10
Concept of Pollution	
Air Pollution- Causes, effects and control measures	
Water Pollution- Causes, effects and control measures	
Soil Pollution- Causes, effects and control measures	
Noise Pollution- Causes, effects and control measures	
UNIT3: Value Education	10
Meaning of value education	
Value education about air pollution	
Value education about water pollution	
Value education about land/soil pollution	
Value education about noise pollution	

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4. Sharma P.D. 2015, Ecology and Environment, Rastogi Publications, Meerut
5. Kormondy, Edward J., 2012, Concept of Ecology, PHI Learning Pvt. Ltd, New Delhi
6. Singh R.B. (Eds) 2009, Biogeography and Biodiversity, Rawat Publications, Jaipur
7. Singh S., Prayag, 1997, Environment Geography, Pustak Bhawan, Allahabad
8. Chandana R.C. 2002, Environmental Geography, Kalyani Publication, Ludhiana
9. Goudie A., 2001, The Nature of The Environment, Blackwell, Oxford

10. Gholap T.N., 2000, Environment Science, Nishikant Publications, Pune. (Marathi)
11. Choudhar A.H., & et. al., 2014, Disaster Management, Atharva Publication, Pune. (Marathi)
12. Musmade A. H., More J. C. 2014, Geography of Disaster Management, Diamond Publication, Pune. (Marathi)
13. Saptarshi P. G., More J. C., Ugale V. R., 2009, Geography and Natural Hazards, Diamond Publishing, Pune. (Marathi)

**CBCS Syllabus as per NEP 2020 for F.Y.B.A
Geography(2023 Pattern)****Name of the Programme:** FYBA Geography**Programme Code** : UAGEO**Class** : FYBA**Semester** I**Course Type** : Indian Knowledge System**Course Code** : GEO-137-IKS**Course Title** : Ancient Indian Geographical Thoughts**No. of Credits** 02**No. of Teaching Hours** 30**Course Objectives:**

1. To introduce the students with ancient Indian geographers and their contribution.
2. To understand the historical development of geography and various allied subjects.
3. To know the universe and its origin and different theories regarding it.
4. To understand astronomical concepts and their relevance to geography.
5. To understand the mathematical thermos.
6. To introduce the principles of mathematical and astronomical thermos.
7. To understand the impact of exploration and discoveries in subject matter.

Course Outcomes:**By the end of the course, students will be able to:****CO1.** Understand ancient Indian geographers and their contribution.**CO2.** Know historical development of geography and various allied**CO3.** Familiar with the universe and its origin and different theories regarding it. **CO4.** Understand astronomical concepts and

their relevance to geography.

CO5. Analyse the mathematical thermos.**CO6.** Understand principles of mathematical and astronomical thermos.**CO7.** Understand the impact of exploration and discoveries in subject matter

Topics and Learning Points

UNIT 1: Ancient Indian Geographers	Teaching Hours
Varahamihira	10
Brahmagupta	
Bhaskaracharya	
Aryabhatta	
UNIT 2: Discoveries in mathematics and Astronomy	10
Universe and its origin	
Eclipse	
Earth	
Latitude and Longitude	
Cardinal Point	
UNIT 3: The impact of exploration and discoveries	10
Discovery of continents	
Mountains and rivers	
The Ganga	
The Tsangpo	

References:

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2. Coffey, W. J. (1981): Geography : Towards a general spatial systems approach, Methuen, London
3. Dikshit, R.D. (1997): Geographical Thought: A Contextual History of Ideas, Pub. By A.K. Ghosh, Prentice-Hall of India Pvt. M97, New Delhi.
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6. Hussain, M. (1995): Evolution of Geographical Thought, Rawat Pub. Jaipur
7. Singh I. (2006): Diverse aspect of Geographical Thought, ALFA Publications, New Delhi