CBSE | DEPARTMENT OF SKILL EDUCATION
CURRICULUM FOR SESSION 2021-2022
GEOSPATIAL TECHNOLOGY (SUBJECT CODE - 818)

JOB ROLE : GIS OPERATOR
Class – XII

COURSE OVERVIEW:

Geospatial technology is an umbrella phrase associated with a range of various technologies which include remote sensing, Global Positioning System (GPS), Geographic Information System (GIS), information technologies, and field sensors, that are intended to facilitate the process of capturing/storing/ processing/ displaying/ disseminating information tied to a location.

This present course curriculum offers an opportunity for the students to understand the basics of geospatial technology for developing an interest in the principles, practical uses, and resources related to geospatial technologies. With the exponential growth of Indian geospatial market, this initiative is intended to develop the pool of manpower trained in this subject. This course will enable the students to get an insight into the diverse geospatial database concepts, creating and implementing of the same, GIS theory and spatial analysis, supplemented by extensive practical exercises. Also, it will help the students to acquire skills for further studies and to enter the professional world.

OBJECTIVES OF THE COURSE:

In this course, the students will be introduced to the fundamental concepts of Geospatial Technology and the career opportunities available in this field. This vocational course offers professional education dealing with mapping and Geospatial production to ensure that students obtain insight into Geospatial database concepts, creating and implementing database, spatial analysis, developing GIS applications, through both theoretical concepts and supported by extensive practical exercise with hands-on training using Geomatica industry standard software.

Followings are the main objectives of this course.

- To provide knowledge to students to compile, analyze, and present geospatial data. Students will learn these basic geospatial concepts while working with Rolta's Geomatica software.

- To familiarize the students with various dimensions of Geospatial Technology and career opportunities available in these fields.

- To develop creative thinking among students and make them technology-savvy so that they could be ready to join the Geospatial industry.

SALIENT FEATURES:

➢ Geospatial technologies with proven capabilities for supporting decision making can effectively support governance, enable sustainable development, assist in better management of business process as well as bring location-based information closer to the people.

➢ Geographic information has application in practically all walks of human existence.

➢ In the present economic scenario, there is an increasing demand for cost effective solutions for decision making which is likely to propel the usage of this technology and professionals across sectors in the near future.

➢ Geospatial technology is perhaps the only technology that can provide a holistic approach to the understanding of the interactions and inter-linkages between the earth's biophysical and social elements to strike an optimal balance between developmental and environmental goals.

LIST OF EQUIPMENT AND MATERIALS:

➢ Computers
➢ Rolta Geomatica Software (Provided by CBSE)
➢ Internet connectivity
➢ LCD Projector (optional)
➢ Projector Screen (optional)

CAREER OPPORTUNITIES:

Geospatial technology is ubiquitous and the expanse of its reach in multiple fields is growing rapidly. Most technologies require a spatial component and it is one of the pillars of emerging technologies. Be it our day-to-day activities or cutting-edge futuristic research, none can be visualized without geospatial information. A vast range of career opportunities are available in this field. Following are just few of them-

➢ Geospatial Data Technician
➢ Geospatial Scientist
➢ Image Scientist/ Analyst
➢ Geospatial Developer
➢ Geospatial Programmer
➢ Geospatial Database Engineer
➢ Forensic Analyst
➢ Criminal Intelligence Analyst

VERTICAL MOBILITY:

- ➤ GIS Operator -------GIS Assistant or Technician -------GIS Specialist---------------------- GIS
- ➤ Analyst -------- Senior GIS Analyst ---------- GIS Coordinator ------------------------------- GIS
- ➤ Scientist/ Manager.

OCCUPATIONS USING GEOSPATIAL TECHNOLOGY:

- o Agriculture
- o Archeology
- o Banking and Financial Services
- o Business
- o Census
- o Conservation
- o Criminal Justice
- o Defense and Intelligence
- o Disaster Management
- o Education
- o Economic Development
- o Education Administration
- o Education and Research
- o Elections
- o Emergency Response
- o Energy
- o Engineering
- o Environmental Health
- o Environmental Law
- o Environmental Planning
- o Epidemiology
- o Fire Science Forestry

GEOSPATIAL TECHNOLOGY (SUBJECT CODE -818)
CLASS – XII

Total Marks: 100 (Theory-60 + Practical-40)

	TERM	UNITS	NO. OF HOURS for Theory and Practical	MAX. MARKS for Theory and Practical
Part A		**Employability Skills**		
	Term I	Unit 1 : Communication Skills-IV	13	05
		Unit 2 : Self-Management Skills-IV	07	
		Unit 3 : ICT Skills-IV	13	
	Term II	Unit 4 : Entrepreneurial Skills-IV	10	05
		Unit 5 : Green Skills-IV	07	
		Total	**50**	**10**
Part B		**Subject Specific Skills**		
	Term I	Chapter 1: Remote Sensing (RS)	30	18
		Chapter 2: Geographic Information System(GIS)	10	07
	Term II	Chapter 2: Geographic Information System(GIS)	20	10
		Chapter 3: Global Positioning System (GPS)	20	05
		Chapter 4: Trends in Geospatial Technology	20	05
		Chapter 5: Applications of Geospatial Technology	20	05
		Total	**120**	**50**
Part C		**Practical Work**		
		Project		10
		Viva		05
		Practical File	90	10
		Demonstration of skill competency via Lab Activities		15
		Total	**90**	**40**
		GRAND TOTAL	**260**	**100**

NOTE: Detailed Curriculum/ Topics to be covered under Part A: Employability Skill can be downloaded from CBSE website.

PRACTICAL GUIDELINES FOR CLASS XII

Assessment of performance:

The two internal examiners, assigned for the conduct and assessment of Practical Examinations each in **Senior Secondary School Curriculum (Under NSQF).** Question for the viva examinations should be conducted by two examiner (one internal and one external) both the examiners. Question to be more of General nature, project work or the curriculum. Investigatory Project especially those that show considerable amount of effort and originality, on the part of the student, should get suitable high marks, while project of a routine or stereotyped nature should only receive MEDIOCRE marks.

Procedure for Record of Marks in the Practical answer-books:

The examiner will indicate separately marks of practical examination on the title page of the answer-books under the following heads:-

Project -10 marks

Projects for the final practical is given below .Student may be assigned

Viva based on Project -05 marks

The teacher conducting the final practical examination may ask verbal questions related to the project, if any, done by the student. Alternatively, if no project has been assigned to the students, viva may be based on questions of practical nature from the field of subject as per the Curriculum

Practical File -10 Marks

Students to make a PowerPoint presentation. Alternatively, if they can't be assigned a power point presentation then they can communicate their project work through practical file.

Suggested list of Projects –

1. Download a multispectral satellite image and open it in GIS software. Now open the RGB mapper of the image. Convert the image into Panchromatic or change it into false color image. Observe it carefully and explain the steps in your file.
2. Find out the function of GPS in vehicle location. Find out the various apps available in market like Autocop app and explain the procedure. Provide the sample data and maps prepare about the location and movement of that vehicle by the app.
3. Explain the process of triangulation and trilateration with the help of suitable diagrams and timeline. How does this process help in finding accurate location, and velocity of an object?

4. Download a Panchromatic and a Multispectral image and open these in your GIS software. Now view the histograms of these images. Find out the radiometric resolution or scale of the images explain the differences in these histograms. Shoe the single histogram of a Panchromatic image and three histograms of the Multispectral image.

5. Prepare a list of Indian satellites and classify them according to their usage. Explain how IRS series is different from INSAT series of satellites. Give details with examples, diagrams or images.

6. Explain the Buffer analysis tool. Create a buffer of flooding in a toposheet or in NCERT Bhuvan website. Mention all the steps in your file and explain its importance in Hazard mapping.

7. Choose a case study of application of Geospatial technology in the field of Agriculture and natural vegetation. Explain how NDVI is used in this practice.

8. Explain how Geospatial technology is useful in mapping the pandemic of Covid-19 in the world. Explain the disease management and control in detail with the help of GIS.

9. Choose any latest natural or man-made disaster like Australian bush fires and the role of Geospatial technology in its preparedness, mitigation, impact analysis and providing aid and rescue.

10. Mobile and digital gaming is extremely popular among children and youth. These games are widely dependent on social media and Geospatial technology. Choose any game like Pokemon Go and explain in detail how Geospatial technology is used in this gaming.

Demonstration of skill competency in Lab Activities -15 marks

Guidelines for Project Preparation:

The final project work should encompass chapters on:

a) Introduction,

b) Identification of core and advance issues,

c) Learning and understanding, and

d) Observation during the project.