

CBSE | DEPARTMENT OF SKILL EDUCATION
CURRICULUM FOR SESSION 2020-2021

GEOSPATIAL TECHNOLOGY (818)

JOB ROLE: GIS OPERATOR

CLASS – XII (SESSION 2020-2021)

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

	UNITS	NO. OF HOURS for Theory and Practical 260	MAX. MARKS for Theory and Practical 100
Part A	Employability Skills		
	Unit 1 : Communication Skills-II	13	10
	Unit 2 : Self-Management Skills-II	07	
	Unit 3 : ICT Skills-II	13	
	Unit 4 : Entrepreneurial Skills-II	10	
	Unit 5 : Green Skills-II	07	
	Total	50	
Part B	Subject Specific Skills		
	Chapter 1: Remote Sensing (RS)	30	18
	Chapter 2: Geographic Information System (GIS)	30	17
	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	90	10
	Viva		05
	Practical File		10
	Demonstration of skill competency via Lab Activities		15
	Total		90
GRAND TOTAL		260	100

DETAILED CURRICULUM/ TOPICS:

Part-A: EMPLOYABILITY SKILLS

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills-IV	13
2.	Unit 2: Self-management Skills-IV	07
3.	Unit 3: Information and Communication Technology Skills-IV	13
4.	Unit 4: Entrepreneurial Skills-IV	10
5.	Unit 5: Green Skills-IV	07
TOTAL DURATION		50

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

Part-B – SUBJECT SPECIFIC SKILLS

S. No.	Units	Duration in Hours
1.	Chapter 1: Remote Sensing (RS)	30
2.	Chapter 2: Geographic Information System (GIS)	30
3.	Chapter 3: Global Positioning System (GPS)	20
4.	Chapter 4: Trends in Geospatial Technology	20
5.	Chapter 5: Applications of Geospatial Technology	20
DURATION TOTAL		120

UNIT	SUB-UNIT	SESSION/ACTIVITY
1. Remote Sensing (RS)	1.1. Introduction	<ul style="list-style-type: none"> • Introduction • Electromagnetic Spectrum • Stages in Remote Sensing • Wien's Displacement law • Various Interaction Responses of Sun rays
	1.2. Spectral Reflectance Signature	<ul style="list-style-type: none"> • Soil • Vegetation • Water • Rock • 5. Resolution and its types
	1.3. Digital Image Processing	<ul style="list-style-type: none"> • Image restoration • Statistical analysis • Image enhancement • Image classification • Band Rationing • NDVI • PVI
	1.4. Visual Interpretation of Satellite Data	<ul style="list-style-type: none"> • Tone • Shape • Size • Pattern • Texture • Shadow • Association
	1.5. Aerial Photo and its Interpretation	
	1.6. Advanced Remote Sensing Technologies	<ul style="list-style-type: none"> • Hyper Spectral Imagery • Thermal Remote Sensing • Microwave Remote Sensing
	1.7. Advantages and Benefits of RS	
	2. Geographic Information System (GIS)	2.1. Introduction
2.2. GIS Data Element and Data Structure		<ul style="list-style-type: none"> • GIS functions • Data Structure
2.3. Fundamentals of Database concepts		<ul style="list-style-type: none"> • Spatial data input • Attribute data input • Linking of both the data set

***Note :- To be assessed in practical only. No question shall be asked from this portion in Theory Exams.**

UNIT	SUB-UNIT	SESSION/ACTIVITY
	2.4. Data Input to GIS System	<ul style="list-style-type: none"> • Digitization • Data transfer • Key board entry
	2.5. GIS Data Editing	<ul style="list-style-type: none"> • Topology building • Topological errors • Location errors • Edge matching
	2.6. Attribute Data linking	
	2.7. Spatial and Non-Spatial data analysis	<ul style="list-style-type: none"> • Query- Boolean algebra • Dissolve • Overlay • Merge • Buffer analysis • TIN
	2.8. Map Projection and Coordinate System	<ul style="list-style-type: none"> • Projections • Coordinate systems • UTM • Datum • WGS84
	2.9. Digital Cartography	
	2.10. Advantages and Benefits of GIS	
3. Global Positioning System (GPS)	3.1. Introduction	<ul style="list-style-type: none"> • Introduction and History • Segments of GPS • dilatation
	3.2. GPS Accuracy and Accuracy factors	<ul style="list-style-type: none"> • Errors • Clock offset
	3.3. Types of GPS	<ul style="list-style-type: none"> • DGPS • Recreational • Mapping • Survey
	3.4. List of Global Navigation System	<ul style="list-style-type: none"> • Navistar • Glonass • Galileo
	3.5. GPS today & Limitations of GPS	

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UNIT	SUB-UNIT	SESSION/ACTIVITY
	3.6. Uses of GPS Technology	<ul style="list-style-type: none"> • In Survey and Mapping • In Height and location • In Vehicle tracking
4. Trends in Geospatial Technology	4.1. Introduction	
	4.2. Remote Sensing Trends and Technology	<ul style="list-style-type: none"> • Trends in Technology • Trends in Application
	4.3. GIS Trends and Technology	<ul style="list-style-type: none"> • Web based GIS • Enterprise GIS • Mobile GIS • 3D visualization • Open GIS
	4.4. GPS Trends and Technology	<ul style="list-style-type: none"> • Stone age • Star age • Radio age • Satellite age • Latest Development
5. Applications of Geospatial Technology	5.1. Introduction	
	5.2. Watershed Studies	
	5.3. Flood Studies	
	5.4. Health Issues	
	5.5. Utility Studies	
	5.6. Security and Defense Studies	
	5.7. Urban and Infrastructure Studies	

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UNIT	SUB-UNIT	SESSION/ACTIVITY
	5.8. Disaster Relief Management	
1. Projection of data	1.1 Dereferencing. 1.2 Coordinating System and components. 1.3 Image to map registration. 1.4 Image to image registration.	
2. Digitization	2.1. Building Topology	
3. Digital image Processing	3.1 Image enhancement. 3.2 Unsupervised classification. 3.3 Supervised classification.	
4. Geospatial data creation and editing	4.1. Querying (Location parameters, graphics etc.). 4.2. Projection data. 4.3. Building geo database.	
5. Spatial Analysis and Thematic Mapping	5.1. Overlay analysis 5.2. Reprocessing of data intersection, union dissolve, merge, clip. 5.3. Functional attribute and expression. 5.4. Statistics and Report generation.	

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UNIT	SUB-UNIT	SESSION/ACTIVITY
6. Symbiology and layouts	6.1. Map surfing. 6.2. Preparing map and its layout. 6.3. Indexing. 6.4. Scale and annotation. 6.5. Preparing maps for presentation.	
7. On job training	7.1. Preparation of maps for. 1. Environment analysis. 2. Urban area. 3. Water bodies. 4. Agriculture and Forest Collecting ground truth with GPS Overlaying of different maps in GIS.	

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