SELF-FINANCING

SYLLABUS FOR M.Sc. GEOGRAPHIC INFORMATION SCIENCE (GISC) SEMESTER SCHEME Choice Based Credit System (CBCS)

Effective from 2016-17 onwards

Dr. Ashok Hanjagi
Chairman, BOS
Syllabus & Regulations Governing the Choice Based Credit System (CBCS) for the Two Years (Four Semesters) Master of Science (M.Sc.) in Geographic Information Science Programme in the Faculty of Science

Self-Financing

Eligibility for Admission:
Candidates who have passed any Bachelor Degree examination of Bangalore University or any other Universities are eligible for admission to the course provided they have secured 50% marks in the aggregate of all subjects (45% for SC/ST/Category-I Candidates).

Scheme and Duration of the Course
M.Sc Geographic Information Science course consists of 4 semesters in two academic years, first and second semesters will have five theories (core) out of which one paper is soft core and four practical. Third semester will have four theories (core) of which, one paper is elective and one is open elective and four practical. Fourth semester will have Project Work, Internship and Field Study Tour.

In the Internship, the students are expected to work as interns in any of the company / institution / organization, etc in their projects towards application of Geoinformatics to real world problems.

Duration of the Course: The duration of the M.Sc. Geographic Information Science Course shall extend over 4 semesters (two academic years) of 16 weeks or more each with a maximum of 90 actual working days of instruction in each semester.

Course pattern: In the faculty of Science, the number of credits per semester may vary from 24 to 26, an average of 25 credits per semester and a total of around 100 credits for the programme. The credits shall be based on the number of instructional hours per week, generally 1 credit per hour of instruction in theory and 1 credit for 2 hours of practical or project work or internship per week.

The courses offered in a programme may be the core, elective and soft courses. There shall be soft core courses of 3 hours of instruction per week in the first and second semesters, open electives & elective in the third semester, and project work in lieu of one or two theory / practical in the second / third and / or fourth semesters.

Exit Option
The present M.Sc. Geographic information Science course has an exit option after two semesters (one year) with Degree of PG Diploma in Geoinformatics. The students completing two years will get Degree with MSc in Geographic Information Science. Students are required to undertake project work and field study which is a part of study at fourth semester. There shall be University examination at the end of each semester. The course pattern & the scheme of examinations are as follows:
### Details for the Scheme of Study & Examination of Choice Based Credit System, Master of Science in Geographic Information Science

#### Semester – I

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title of the Paper</th>
<th>Type</th>
<th>Instruction Hour per Week</th>
<th>Total No. of Hours</th>
<th>Duration of Exam</th>
<th>IA Marks</th>
<th>Exam Marks</th>
<th>Total Marks</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC 1.1</td>
<td>Introduction to Spatial Science</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>HC 1.2</td>
<td>Fundamentals of Cartography</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>HC 1.3</td>
<td>Fundamentals of Geographical Information Systems</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>HC 1.4</td>
<td>Basics of Remote Sensing</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
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<td>100</td>
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<tr>
<td>HC 1.5</td>
<td>Remote Sensing Lab: 1</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
<td>35</td>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>HC 1.6</td>
<td>Techniques of Mapping &amp; Mapping Analysis</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
<td>35</td>
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</tr>
<tr>
<td>HC 1.7</td>
<td>Open Source GIS</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
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<tr>
<td>HC 1.8</td>
<td>GIS LAB 1</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
<td>35</td>
<td>50</td>
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<tr>
<td>SC 1.9</td>
<td>Programming Language</td>
<td>Theory</td>
<td>3</td>
<td>39</td>
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<td>30</td>
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</table>

**TOTAL**

- 35 Hour /week
- 445 Hours /Sem
- 210
- 490
- 700
- 26

### Semester – II

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title of the Paper</th>
<th>Type</th>
<th>Instruction Hour per Week</th>
<th>Total No. of Hours</th>
<th>Duration of Exam</th>
<th>IA Marks</th>
<th>Exam Marks</th>
<th>Total Marks</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>HC 2.1</td>
<td>Photogrammetry</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>HC 2.2</td>
<td>Surveying and GNSS</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>HC 2.3</td>
<td>Geoinformatics for Water Resource Management</td>
<td>Theory</td>
<td>4</td>
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<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>HC 2.4</td>
<td>Geo-informatics for Regional Planning and Development</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>HC 2.5</td>
<td>Surveying</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
<td>35</td>
<td>50</td>
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<tr>
<td>HC 2.6</td>
<td>GIS LAB 2</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
<td>35</td>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>HC 2.7</td>
<td>Remote Sensing Lab: 2</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
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<td>2</td>
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<tr>
<td>HC 2.8</td>
<td>Mini-Project</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
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<tr>
<td>SC 2.9</td>
<td>Research Methodology</td>
<td>Theory</td>
<td>3</td>
<td>39</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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</table>

**TOTAL**

- 35 Hour /week
- 445 Hours /Sem
- 210
- 490
- 700
- 26
Details for the Scheme of Study & Examination of Choice Based Credit System, Master of Science in Geographic Information Science

Semester – III

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title of the Paper</th>
<th>Type</th>
<th>Instruction Hour per Week</th>
<th>Total No. of Hours</th>
<th>Duration of Exam</th>
<th>IA Marks</th>
<th>Exam Marks</th>
<th>Total Marks</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HC 3.1</td>
<td>Basics of Statistics</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
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<tr>
<td>HC 3.2</td>
<td>Disaster Management</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>HC 3.3</td>
<td>Geoinformatics for Environmental Impact Assessment / Geoinformatics for Natural Resource Management</td>
<td>Theory</td>
<td>4</td>
<td>52+ 52</td>
<td>3</td>
<td>30</td>
<td>70</td>
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<tr>
<td>HC 3.4</td>
<td>Utility Mapping</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
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<tr>
<td>HC 3.5</td>
<td>Web-GIS</td>
<td>Practical</td>
<td>4</td>
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<td>3</td>
<td>15</td>
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<td>2</td>
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<tr>
<td>HC 3.6</td>
<td>Remote Sensing Lab 3</td>
<td>Practical</td>
<td>4</td>
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<td>15</td>
<td>35</td>
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<td>2</td>
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<tr>
<td>HC 3.7</td>
<td>GIS Lab 3</td>
<td>Practical</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>15</td>
<td>35</td>
<td>50</td>
<td>2</td>
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<tr>
<td>OE 3.8</td>
<td>Geography for All</td>
<td>Theory</td>
<td>4</td>
<td>52</td>
<td>3</td>
<td>30</td>
<td>70</td>
<td>100</td>
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<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>32 Hour /week</td>
<td>468 Hours /Sem</td>
<td>180</td>
<td>420</td>
<td>600</td>
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Details for the Scheme of Study & Examination of Choice Based Credit System, Master of Science in Geographic Information Science

Semester - IV

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title of the Paper</th>
<th>Type</th>
<th>Instruction Weeks per Semester</th>
<th>Duration of Exam</th>
<th>IA Marks</th>
<th>Exam Marks</th>
<th>Total Marks</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HC 4.1</td>
<td>Project Work</td>
<td>Project Work</td>
<td>6 weeks</td>
<td>Viva-voce</td>
<td>75</td>
<td>175</td>
<td>250</td>
<td>10</td>
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<tr>
<td>HC 4.2</td>
<td>Internship</td>
<td>Internship</td>
<td>8 Weeks</td>
<td>Viva-voce</td>
<td>75</td>
<td>175</td>
<td>250</td>
<td>10</td>
</tr>
<tr>
<td>HC 4.3</td>
<td>Field Study Tour</td>
<td>Field Study Tour</td>
<td>2 weeks</td>
<td>Viva-voce</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>16 Weeks</td>
<td></td>
<td>180</td>
<td>420</td>
<td>600</td>
<td>24</td>
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</table>

Grand Total Marks of all the four semesters………………………………………………2600

Medium of instruction: The medium of instruction shall be English only.

Attendance: The course (Theory, practical etc.) shall be treated as an independent unit for the purpose of attendance. A student shall attend a minimum of 75% of the total instruction hours in a course including assignments and seminars in each semester. There shall be no provision for condonation of shortage of attendance and a student who fails to secure 75% attendance in a course shall be required to repeat that semester.
**Internal Assessment:** Marks for internal assessment shall be awarded on the basis of Attendance, Test and Assignments/Seminars. The internal assessment marks shall be notified on the department notice board for the information of the students and it shall be communicated to the Registrar (Evaluation) within 10 days before the commencement of the University examinations, and the Registrar (Evaluation) shall have access to the records of such internal assessment evaluations.

**Intake:** 20 seats

**Reservation of Seats:** Of the total 20 seats, 50% of the seats will be admitted for Bangalore University students with the University norms. 25% of the seats will be allocated to the students belonging to other than Bangalore University within Karnataka state. Remaining 25% of the seats will be allocated to the candidates belonging to outside Karnataka state. However, if the candidates from Bangalore University are fallen vacant then candidates belonging to outside Bangalore University within Karnataka may be admitted. If the candidates both from Bangalore University and within Karnataka have fallen vacant then outside Karnataka candidates may be admitted.

**Board Of Examiners (BOE):** Board of examiners constituted by the University shall consist of a Chairman, internal and external members out of which at least one shall be from the Department offering the course and at least two external members from other universities. The board shall scrutinize the question papers and shall forward for the approval of university.

**Results:** A candidate should obtain a minimum of 40% marks in each of the papers in the University examination and 50% marks including internal assessment marks. A candidate should obtain a minimum of 50% marks in all Semesters. The candidates who have passed in all the semester examinations are eligible for the M.Sc. Degree in Geographic Information Science (GiSc).

** Carry Over:** A candidate who fails in a lower semester examination may go to the higher semester, however, the result of the candidates who have passed the IV semester examination but not passed the lower semester examinations shall be declared as NCL (not completed lower semester examinations). Such candidates shall be eligible for the degree only after completion of all the lower semester examinations.

**Scheme of Theory Examination:**

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
<th>Marks</th>
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</thead>
<tbody>
<tr>
<td><strong>Section A:</strong></td>
<td>Write brief notes on any four of the following 10 x 2=20</td>
<td></td>
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<tr>
<td><strong>Section B:</strong></td>
<td>Answer any three of the following 4 x 5 = 20</td>
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<tr>
<td><strong>Section C:</strong></td>
<td>Answer any two of the following 3 x 20 = 30</td>
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</tbody>
</table>
I Semester
Paper: 1.1 Introductions to Spatial Science
Teaching Hour: 52 hrs

Unit 1
Nature & Scope of Geography. Traditions in Geography: Areal Differentiation, Landscape Theme, Environment Theme, Spatial Distribution and Geometric theme. Inter-disciplinary and Intra-disciplinary approaches in Geography. Pioneers and their Contributions to Geography: Ancient period, Medieval period and Modern period. 13 hrs

Unit 2

Unit 3

Unit 4

References:

Web Resources:
13. www.roebuckclasses.com › Orientation › Lectures
I Semester  
Paper: 1.2 Fundamentals of Cartography  
Teaching Hour: 52 hrs

Unit 1:  
13 hrs

Unit 2  
13 hrs

Unit 3  
Scope and objectives of map design, controls of map design and constrains in map design. Map Scale: Statement, Representative Fraction and Geographical Scales, Determining map scale. Ground Survey and Positioning: Measuring distance, and direction, Traditional Survey methods, Automated Survey System.  
13 hrs

Unit 4  
Types of Maps – Perception and Designing, Color and Pattern Creation, Typography and Lettering the map, Map compilation and map layout, Future Cartography. Mapping organization and services in India: SOI, NATMO and NRSC.  
13 hrs

References:  
8. N.D.Mani (2015), Perceptiveal cartography and district planning, published by concept.pub.co  

Web resources  
15. https://www.lib.uiowa.edu/maps/cartog
I Semester
Paper: 1.3 Fundamentals of Geographical Information Systems
Teaching Hour: 52 hrs

Unit 1
Basic Spatial Perspective and GIS Concepts: GIS definitions, concept of spaces, approaches and components, history and development of GIS. Spatial & Non-spatial Data: Data information, data type, data sources, characteristics of spatial and non-spatial data, raster and vector data models, geographical matrix, data stream. 13 hrs

Unit 2

Unit 3
Manipulation and Analysis of Data: Measurement of lengths, perimeter and areas, queries, buffer analysis, topology, neighborhood operations, network operations, overlay analysis, location-allocation analysis problems and surface analysis. Interpolation and its methods. 13 hrs

Unit 4

References:
5. Jatin Pandey & Darshana Pathak (2013), Geographical Information System, The Energy and Resources Institute, TERI
9. Peter M. Atkinson & Nicholas Tate (2015), Advances in Remote Sensing and GIS Analysis, Published by Wiley India.

Web resources
12. www.gisgeography.com › Data Sources
13. www.webgis.com/
15. https://www.mapbox.com/blog/turf-gis-for-web-maps
I Semester
Paper: 1.4 Basics of Remote Sensing

Teaching Hour: 52 hrs

Unit 1
Remote Sensing: Development of Remote Sensing: Definition – types – chronological development; international remote sensing centres; Indian remote sensing centres and their activities – new satellite programs of India. Electro Magnetic Radiation (EMR) and Electro Magnetic Spectrum, Interaction of EMR with the atmosphere & with the surface feature. Atmospheric window; spectral signature of common land covers (minerals, rocks, water, vegetation and urban area) 13 hrs

Unit 2
Fundamentals of Aerial Photography: Classification of Aerial Photographs on the basis of Height and Tilt, Components of the Camera, Film, Aerial Platforms. Elements of Aerial photo interpretation: Formats of Imagery: Digital and Analog data. 13 hrs

Unit 3

Unit 4

References:
1. Basudeb Bhatta, 2nd Edition,(2013), Remote Sensing and GIS, Published by Oxford University Press, USA.
7. Peter M. Atkinson & Nicholas Tate, (2012), Advances in Remote Sensing and GIS Analysis, Wiley India Pvt Ltd

Web resources
13. remotesensing.usgs.gov/
14. grindgis.com/what-is-remote-sensing/know-basics-of-remote-sensing
I Semester
Practical: 1.5 Remote Sensing Lab: 1
Teaching Hour: 52 hrs

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise</th>
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<tbody>
<tr>
<td>1</td>
<td>An introduction of Aerial Photographs</td>
</tr>
<tr>
<td>2</td>
<td>Elements of Aerial photo interpretation</td>
</tr>
<tr>
<td>3</td>
<td>Determining the scale of Aerial Photographs and construction methods</td>
</tr>
<tr>
<td>4</td>
<td>Stereographic view obtaining methods</td>
</tr>
<tr>
<td>5</td>
<td>Interpretation of aerial photographs and fringe information</td>
</tr>
<tr>
<td>6</td>
<td>Extracting physical features from aerial photo preparing layers and interpretation</td>
</tr>
<tr>
<td>7</td>
<td>Extracting cultural features from aerial photo preparing layers and interpretation</td>
</tr>
<tr>
<td>8</td>
<td>An introduction of Satellite images and fringe information</td>
</tr>
<tr>
<td>9</td>
<td>Comparison features in Toposheet, aerial photographs and satellite imageries</td>
</tr>
<tr>
<td>10</td>
<td>Identification of features through signatures, color identifications</td>
</tr>
<tr>
<td>11</td>
<td>Elements of Satellite image interpretation</td>
</tr>
<tr>
<td>12</td>
<td>Preparing land use map from satellite imageries and interpretations</td>
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<tr>
<td>13</td>
<td>Preparation of thematic maps from the satellite imagery</td>
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<tr>
<td>14</td>
<td>Understanding the pixel values in satellite image</td>
</tr>
<tr>
<td>15</td>
<td>Understanding the difference between the panchromatic and multispectral images</td>
</tr>
</tbody>
</table>

References:
7. Peter M. Atkinson & Nicholas Tate ,(2012),Advances in Remote Sensing and GIS Analysis, Wiley India Pvt Ltd

Web resources
13. remotesensing.usgs.gov/
14. bhuvan.nrsc.gov.in/
15. www.isro.gov.in/
## I Semester
### Practical: 1.6 Techniques of Mapping and Analysis

**Teaching Hour:** 52 hrs

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise</th>
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<tbody>
<tr>
<td>1</td>
<td>An introduction to Cartographic Appreciation</td>
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<tr>
<td>2</td>
<td>Proportional Symbols</td>
</tr>
<tr>
<td>3</td>
<td>Representation of Data by applying Mono Dot Method</td>
</tr>
<tr>
<td>4</td>
<td>Representation of Data by applying Multiple Dot Method</td>
</tr>
<tr>
<td>5</td>
<td>Representation of Data by applying Circle Method</td>
</tr>
<tr>
<td>6</td>
<td>Representation of Data by applying Sphere Method</td>
</tr>
<tr>
<td>7</td>
<td>Representation of Data by applying Cube Method</td>
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<tr>
<td>8</td>
<td>Construction of Choropleth Map for the selected data</td>
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<tr>
<td>9</td>
<td>Construction of Isopleth Map for the selected data</td>
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<tr>
<td>10</td>
<td>Construction of Gray Scale Map for the selected data</td>
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<tr>
<td>11</td>
<td>Construction of Choro-chromatic Method for the selected data</td>
</tr>
<tr>
<td>12</td>
<td>Construction of Choro-schematic maps for the selected data</td>
</tr>
<tr>
<td>13</td>
<td>Preparing Block Pile Diagrams for the datasets</td>
</tr>
<tr>
<td>14</td>
<td>Preparing Pie Diagrams for the datasets</td>
</tr>
<tr>
<td>15</td>
<td>Preparing Flow diagrams for the datasets</td>
</tr>
</tbody>
</table>

### References:


### Web resources

15. https://www.lib.uiowa.edu/maps/cartographic/
## I Semester
### Practical: 1.7 Open Source GIS

**Teaching Hour:** 52 hrs

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Familiarization with QGIS Software</td>
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<tr>
<td>2</td>
<td>Geo-referencing and Projecting Raster Data</td>
</tr>
<tr>
<td>3</td>
<td>Creating Vector Data Model and Projecting</td>
</tr>
<tr>
<td>4</td>
<td>Digitizing – Point, Line and Polygon features</td>
</tr>
<tr>
<td>5</td>
<td>Special Digitizing features adjoining polygon, split and joining</td>
</tr>
<tr>
<td>6</td>
<td>Creating Attributes – Character, Numbers and Float</td>
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<tr>
<td>7</td>
<td>Linking attributes to special features and Labeling</td>
</tr>
<tr>
<td>8</td>
<td>Using Symbology and Typography</td>
</tr>
<tr>
<td>9</td>
<td>Map Layout and Exporting Map in Different Format</td>
</tr>
<tr>
<td>10</td>
<td>Unique Symbol Maps – Dot, Classified, Unique Value</td>
</tr>
<tr>
<td>11</td>
<td>Preparation of Cartographic Maps – Choropleth, Bar, Pie and Stacked</td>
</tr>
<tr>
<td>12</td>
<td>Query Building and Executing to analysis the data</td>
</tr>
<tr>
<td>13</td>
<td>Buffer Analysis</td>
</tr>
<tr>
<td>14</td>
<td>Overlay Analysis for the required layers for interpretation</td>
</tr>
<tr>
<td>15</td>
<td>Interpreting Spatial Analysis Maps</td>
</tr>
</tbody>
</table>

### References:
5. **Heywood I, (el.)**, An Introduction to Geographical Information Systems, Pearson (2011)
9. **Mohini Bherwani,(2012)**, Metadata in context to open source softwares, Published by Dattsons.

### Web resources
14. [www.gisgeography.com › Software](http://www.gisgeography.com › Software)
15. [https://grass.osgeo.org/](https://grass.osgeo.org/)
## I Semester
### Practical: 1.8 GIS Lab-1

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An Introduction to GIS</td>
</tr>
<tr>
<td>2</td>
<td>Measurement of Scales: Nominal, Ordinal and Ratio methods</td>
</tr>
<tr>
<td>3</td>
<td>Identification of Objects</td>
</tr>
<tr>
<td>4</td>
<td>Extraction of Physical features from toposheets</td>
</tr>
<tr>
<td>5</td>
<td>Extraction of Cultural features from toposheets</td>
</tr>
<tr>
<td>6</td>
<td>Creating Vector Data Model</td>
</tr>
<tr>
<td>7</td>
<td>Creating Raster Data Model</td>
</tr>
<tr>
<td>8</td>
<td>Creating Cartesian Coordinates System</td>
</tr>
<tr>
<td>9</td>
<td>Construction of Spagathi Model</td>
</tr>
<tr>
<td>10</td>
<td>Creating TIN to understand the surface elevation</td>
</tr>
<tr>
<td>11</td>
<td>Creating Buffering</td>
</tr>
<tr>
<td>12</td>
<td>Overlay analysis for different identification based on requirement</td>
</tr>
<tr>
<td>13</td>
<td>Creating Rainfall Variability and Intensity Map</td>
</tr>
<tr>
<td>14</td>
<td>Creating Tourism Interest Maps</td>
</tr>
<tr>
<td>15</td>
<td>Creating a Simple Model</td>
</tr>
</tbody>
</table>

### References:
9. **Mohini Bherwani**, (2012), Metadata in context to opean source softwares, Published by Dattsons.

### Web resources
14. [www.gisgeography.com › Software](http://www.gisgeography.com › Software)
15. [https://grass.osgeo.org/](https://grass.osgeo.org/)
I Semester
Paper: 1.9 Programming Languages

Teaching Hour: 52 hrs

UNIT I:
Preliminary Concepts: Why and how to study programming languages; Examples of languages with brief case studies; History and evolution; Programming paradigms; Good, bad, and successful languages. Overview of selected languages: Tours of [Ruby | Python], JavaScript, [Clojure | Haskell | Scala | ML], [Go | Rust | Swift], highlighting interesting and unique features; Comparisons with popular languages such as Java, C, and C++. Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, denotational semantics and axiomatic semantics for common programming language features. 13 hours

UNIT II:
Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands. 13 hours

UNIT III:
Subprograms and Blocks: Fundamentals of sub-programs, Scope of life time of variables, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators. 13 hours

UNIT IV:
References:

8. LISP Patric Henry Winston and Paul Horn Pearson Education.

Web resources
2. https://en.wikipedia.org/wiki/Programming_languages_used_in_most_popular_websites
3. https://www.quora.com/What-programming-languages-should-I-learn-for-web-devel...
II Semester
Paper: 2.1 Photogrammetry

Teaching Hour: 52 hrs

Unit 1
**Basics of Aerial Photographs:** Historical development, principles aerial of photographs, types and uses. Films used, flight planning for aerial survey, aerial camera and photographic products: Parts of camera: lens, shutter, filter, camera frame. Camera: terrestrial, airborne. Satellite, photographic and digital products, marginal information and content, Ground Control Points.

Unit 2
**Photogrammetry:** Errors in aerial photographs, Relief displacement and parallax, scale factors, resolution, coverage. Element of photo interpretation, interpretation keys, plotting methods, radial line, plotting instruments.

Unit 3
**Rectification and Orthophotography:** Orientation and projection, geometric correction, aerial triangulation, adjustments, orthophotography, mosaic.

Unit 4

References:

Web resources
13. r-s-s-c.org/rscv/v112.html
14. www1.rmit.edu.au/courses/03847
15. www.isprs.org/
II Semester
Paper: 2.2 Surveying and GNSS

Teaching Hour: 52 hrs

Unit 1
Surveying: Introduction, Historical development, overview of GPS: Space, ground control & user segments. Land navigation, marine navigation, survey instruments, Recent trends.

13 hrs

Unit 2
Working principles of GPS: Satellite ranging - resection; error sources atmospheric - ionospheric errors – multipath - Selective availability - antispoofering error rectification - atmospheric and Ionospheric models –choke ring - differentially corrected positions; Positioning techniques - precise point positioning; - Satellite geometry - mask and azimuth angles.

13 hrs

Unit 3
Geodesy and Surveying: Geodesy meaning and application, GNSS – GPS coordinate system, Local Coordinate System, transformations – step wise transformation – seven parameter transformation; Measuring techniques – Static surveys — rapid static survey – kinematic survey – RTK survey – Pre survey preparations – Total Station. GNSS and GIS Integration: Integration techniques - Data focused integration, position focused and technology focused integration; Technology convergence for data use; Methods of integration - NAME, Binary Data control and customization — Active X; Hardware and software platforms; GPS, GIS.

13 hrs

Unit 4
GNSS: Location - Navigation - Tracking - Mapping and Tinning - Misuses of GNSS - types of misuses - examples - Intelligence collection augmentation with weapon system, integration into ballistic and cruise missile systems; Future uses – position information society -consumer based GNSS products.

13 hrs

References:

1. Adams, Henry(2014), Practical Surveying and Elementary Geodesy, : Scholar’s Choice

Web resources:
11. www.tsa-uk.org.uk/for-clients/guidance-notes/
13. www.southinstrument.com/
14. www.ngs.noaa.gov/
15. https://www.aagsmo.org/
II Semester  
Paper: 2.3 Geoinformatics for Water Resource Management  
Teaching Hour: 52 hrs

Unit 1  
13 hrs

Unit 2  
13 hrs

Unit 3  
13 hrs

Unit 4  
13 hrs

References:  

Web resources:  
11. www.poverty-action.org/  
12. wrmin.nic.in/  
II SEMESTER  
Paper: 2.4 Regional Planning and Development  
Teaching Hour:  52 hrs

Unit 1
Regional concept in Geography: Types, hierarchy and characteristics of regions, Delineation methods of regions – Formal, Functional and Nodal. Geography and regional planning. Concept and scope of Regional Planning. Regional Approaches. Principles, methods, techniques of regional planning, need for planning.  

Unit 2

Unit 3
Concept of Development, Indicators of development. Regional imbalance. Regional development strategies. Problems and issues in regional planning. Planning for sustainable development. Regionalization of India: Based on natural, economic and administration (macro and meso levels only). Regional policies in Indian five-year plans, experience of regional planning in India; Evolution, nature and scope of town planning with special reference to India; fundamentals of town & country planning.

Unit 4

References:

Web resources
11. www.northerntier.org/  
12. planning.lacounty.gov/  
13. www.kipda.org/  
14. www.stcplanning.org/  
15. www.smrpc.org/
# II Semester
## Practical: 2.5 Surveying

**Teaching Hour: 52 hrs**

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Traditional and Automated Survey Methods</td>
</tr>
<tr>
<td>2</td>
<td>Simple Height measurements through Total Station</td>
</tr>
<tr>
<td>3</td>
<td>Measurement of area using Total Station</td>
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<tr>
<td>4</td>
<td>Distance measurement using reflection or without reflection</td>
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<tr>
<td>5</td>
<td>Line Profiling and contouring</td>
</tr>
<tr>
<td>6</td>
<td>Contouring</td>
</tr>
<tr>
<td>7</td>
<td>Plotting Buildings</td>
</tr>
<tr>
<td>8</td>
<td>Components of GPS and working procedure</td>
</tr>
<tr>
<td>9</td>
<td>Point Creations using GPS Instruments</td>
</tr>
<tr>
<td>10</td>
<td>Creation of Road network using given area</td>
</tr>
<tr>
<td>11</td>
<td>Creating Micro Polygons</td>
</tr>
<tr>
<td>12</td>
<td>Creating Data Base for Area of Interest</td>
</tr>
<tr>
<td>13</td>
<td>Base point extraction from DGPS</td>
</tr>
<tr>
<td>14</td>
<td>Transformation of GPS Data to the GIS Software</td>
</tr>
<tr>
<td>15</td>
<td>Construction of maps through GPS</td>
</tr>
</tbody>
</table>

### References:

### Web resources
11. www.tsa-uk.org.uk/for-clients/guidance-notes/
13. www.southinstrument.com/
14. www.ngs.noaa.gov/
15. https://www.aagsmo.org
# II Semester Practical: 2.6 GIS Lab

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise</th>
<th>(Total 52 Hrs)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Arc GIS Software – Map, Catalogue and Toolbox</td>
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</tr>
<tr>
<td>2</td>
<td>Methods to Adding Data to Arc Map</td>
<td></td>
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<tr>
<td>3</td>
<td>Toposheet Geo-referencing Using 16 Corners and 4 Corners</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Creation of Data base to manage files in GIS Software – MDB, GDB, Feature Dataset, Feature Class</td>
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<tr>
<td>5</td>
<td>Method Digitations and Trimming</td>
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<tr>
<td>6</td>
<td>Creation of Shape file</td>
<td></td>
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<tr>
<td>7</td>
<td>Method of Merging and Line to Polygon creation</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Attribute creation to linking spatial features</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Methods of different types of Labeling, Flow Labeling and others</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Procedure of using Location Tools and Annotation Tools</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Preparing Different types of Cartographic Maps</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Preparation of Isopleths Map or Interpolation</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Different methods of Query by Location and Attributes</td>
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<tr>
<td>14</td>
<td>Mechanism of Measuring objects in Raster and Vector Layer</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Creation of Map furniture</td>
<td></td>
</tr>
</tbody>
</table>

**References:**

**Web resources:**
9. www.bhuvan.nrsc.gov.in/
10. www.qgis.org/
11. www.gisgeography.com › Software
12. https://grass.osgeo.org/
II Semester
Practical: 2.7 Remote Sensing Lab-2
Teaching Hour: 52 hrs

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise (Total 52 Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Image Processing Software</td>
</tr>
<tr>
<td>2</td>
<td>Methods of Data input and data storage</td>
</tr>
<tr>
<td>3</td>
<td>Displaying an image for image processing</td>
</tr>
<tr>
<td>4</td>
<td>Importing Satellite Imageries to different formats</td>
</tr>
<tr>
<td>5</td>
<td>Geo-referencing and Projecting: Toposheet</td>
</tr>
<tr>
<td>6</td>
<td>Geo-referencing and Projecting India Map</td>
</tr>
<tr>
<td>7</td>
<td>Image to Image Geo-referencing</td>
</tr>
<tr>
<td>8</td>
<td>Creating AOI for different purposes</td>
</tr>
<tr>
<td>9</td>
<td>Sub-setting the image of the interest area</td>
</tr>
<tr>
<td>10</td>
<td>Techniques Mosaic raster data model</td>
</tr>
<tr>
<td>11</td>
<td>Classification: Unsupervised Classification – Changing Band Combinations</td>
</tr>
<tr>
<td>12</td>
<td>Supervised Classification – Recoding, Attribute changing and others</td>
</tr>
<tr>
<td>13</td>
<td>Creating vector layer point, line and polygon</td>
</tr>
<tr>
<td>14</td>
<td>Using Editing for the development of the layers</td>
</tr>
<tr>
<td>15</td>
<td>Map Composer</td>
</tr>
</tbody>
</table>

References:

6. Peter M. Atkinson & Nicholas Tate, (2012), Advances in Remote Sensing and GIS Analysis, Wiley India Pvt Ltd

Web resources:
12. remotesensing.usgs.gov/
13. bhuvan.nrsc.gov.in/
14. www.isro.gov.in/
II Semester
Paper: 2.8 Mini-Project

Teaching Hour: 52 hrs

The students of M.Sc GISc 2nd Semester may have to be selected a specific area for the Project Work. Like Landuse / Land cover Analysis, Water Sources, Slope Studies, climatic Change, Agriculture Studies, Infrastructure Studies, Vegetation Studies, etc. GIS, GPS & RS methods have to be used with appropriate primary and secondary data. The Mini-Project should not exceed 25 pages including photos, references and tables. Mini-Project work must include quality maps, diagrams and flowcharts. The project report has to be included followings:

a) Title / theme of the project
b) Introduction
c) Review of literature
d) Study Area
e) Data sources
f) Main Objective
g) Materials and Method
h) Results and Discussion
i) Conclusion
j) Photos

References

Above work has to be done with the consultation of the staff-in-charge. Viva-Voce would be conducted at the end.

References:
2. DR.S.KARTIKEYAN (2016), Compatative book of research methodology, BHALANI PUBLISHING HOUSE

Web resource
11. www.wiley.com › Geography › Geographical Methodology & Techniques
15. www.ccrm.in
II SEMESTER
Paper: 2.9 Research Methodology

Teaching Hour: 52 hrs

Unit I
Research: Meaning, definition, objectives, characteristics, types, steps involved in Research, Research ethics, approaches, significance, research and scientific methods, research process, criteria of good research, research problems faced by the researchers in India. Review of literature, need for review of literature.

13 hrs

Unit II
Forms of Research: what is research problem, selecting the research problem, necessity of defining the problem, Research paper, article, workshop, Seminars, Conference and Symposia. Research design: Meaning, need, important concepts relating to research design, research design, developing a research plan.

13 hrs

Unit III

13 hrs

Unit IV
Hypothesis, Basic concepts concerning testing of hypothesis, limitations of the tests of hypothesis. Interpretation and report writing: Meaning of interpretation, need of interpretation, techniques of interpretation, interpretation keys, significance of report writing, different steps in report writing, layout of the research report, types of reports, oral presentation, conclusion, findings and suggestions. Bibliography and reference, field photographs.

13 hrs

References:
2. DR.S.KARTIKEYAN (2016),Comparative book of research methodology, BHALANI PUBLISHING HOUSE

Web resource
11. www.wiley.com › Geography › Geographical Methodology & Techniques
15. www.ccrm.in
III Semester
Paper: 3.1 Basics of Statistics

Teaching Hour: 52 hrs

UNIT-I

UNIT-II
Bivariate Analysis: Scatter diagram, correlation analysis, Spearman’s rank correlation and Karl Pearson’s correlation coefficient. Simple Linear Regression Model, Coefficient of determination. 13 hrs

UNIT-III
Probability: Definition, Applications of Addition and multiplication theories of probability, Theorem of total probability. Probability distributions: Binomial, Poisson and normal distributions. Simple random sampling stratified random sampling. 13 hrs

UNIT-IV
Testing of hypothesis: The problem, Null and alternative hypothesis two types of errors, test and level of significance, Testing for mean and equality of means. One way ANOVA. Multivariate analysis: Correlation matrix, partial and multiple correlations. Distance measure. Enihidian distance, Mahelanobis distance. 13 hrs

References:

Web resource
6. www.journals.elsevier.com/spatial-statistics
7. www.spatial-statistics.com/
8. www.spatial-statistics.com/spatial_links_index.htm
10. https://cran.r-project.org/view=Spatial
UNIT – 1
Disasters and GIS: Meaning and types of hazards, disasters and catastrophes – Disaster Management; Earthquakes: causes and effects – measurements - earthquake zones of the world and India – vulnerability and micro zonation; Volcanoes: Causes and effects – volcanic zones of the world and India - volcanic hazards; Landslides: Causes and effects – landslide prone zones in India – GIS case studies for earthquake, volcano and landslide. 13 hrs

UNIT – 2
Emerging approaches to Disaster management: (1) Pre-disaster stage (Preparedness)-hazard zonation maps-predictability and forecasting, land use zoning, Information, Education & Communication (IEC) Disaster resistance house construction, Population reduction in vulnerable area and awareness. (2) Emergency Stage- Rescue training for search and operation at national and regional level, ground management plan preparation, immediate relief, Assessment surveys. (3) Post disaster stage rehabilitation – Political aspects, social aspects, economic aspect, cultural aspect and environmental aspects. 13 hrs

UNIT – 3
Natural Disaster mitigation: Relief measure, role of GIS in Relief measures, role of GPS in search and rescue, role of remote sensing in prediction of hazards and disasters, measures of adjustment of natural hazards. 13 hrs

UNIT – 4
Disaster in Indian context: A regional survey of Land Subsidence, Coastal Disaster, Cyclonic Disaster & Disaster in Hills, terror attacks, communal clashes, Remedial measures. National & international policies for disaster management. Case Studies. 13 hrs

References:
2. H.K. Gupta (Ed), (2003), Disaster Management, Universities Press, India.
8. R.B. Singh, 4th Edition (2013), Space Technology for Disaster Mitigation in India (INced), University of Tokyo.
9. R.K. Bhandani (2011), An overview on Natural & Man made Disaster & their Reduction, CSIR, New Delhi

Web resource
11. www.disaster.qld.gov.au
12. rahat.up.nic.in/
13. asdma.gov.in/
14. www.ndmindia.nic.in/
15. www.dmc.gov.lk/
III Semester  
Paper: 3.3 A. Geoinformatics for Environmental Impact Assessment  
Teaching Hour: 52 hrs

UNIT – 1  
13 hrs

UNIT – 2  
13 hrs

UNIT – 3  
Man Induced Changes on Environment: Environmental Pollution, i.e. Air, Water, Noise and pollution related to Solid Waste with special reference to India. Environmental Hazards, i.e. earth as Warehouses, Flood, Famines, Land Slides, Avalanches, Forest Fires, Impact of Green revolution and Extinction of Species.  
13 hrs

UNIT – 4  
13 hrs

References:  

Web resource  
11. www.snre.umich.edu/  
12. www.srk.com › SRK Worldwide › SRK News  
14. grindgis.com/blog/gis-applications-uses  
15. www.isdm.org.in/Impact-Evaluation
III Semester  
Paper: 3.3 (B) Geoinformatics for Natural Resource Management  
Teaching Hour: 52 hrs

UNIT – 1  
13 hrs

UNIT – 2  
13 hrs

UNIT – 3  
Resources development: Concept of sustainable resource management, methods and sustainable system; integrated resource development and its application. Land evaluation methods- land classification methods-soil and water conservation- land use and Land cover mapping- land use planning and development. Water resource assessment- watershed analysis and management-coastal and ocean resources and management- fisheries management.  
13 hrs

UNIT – 4  
13 hrs

References:
5. Mekonnen Getahun,(2013),GIS and Water based Disaster Management, LAP Lambert Academ

Web resource
13. www.esri.com › Industries
14. www.utwente.nl › Education › Master
15. https: extension.ait.ac.th/course/235
III Semester
Practical: 3.4 Utility Mapping

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise (Total 52 Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Auto Desk</td>
</tr>
<tr>
<td>2</td>
<td>Anatomy of Auto CAD Mapping</td>
</tr>
<tr>
<td>3</td>
<td>Drawing Commands in Auto CAD</td>
</tr>
<tr>
<td>4</td>
<td>Special Commands in Auto CAD Mapping</td>
</tr>
<tr>
<td>5</td>
<td>2 Dimensional Drawing</td>
</tr>
<tr>
<td>6</td>
<td>Image Insert with ortho on, saving image as layer, adjusting map scale, creating layers.</td>
</tr>
<tr>
<td>7</td>
<td>Digitization of polygon, line and point feature</td>
</tr>
<tr>
<td>8</td>
<td>Clean &amp; build and text insert</td>
</tr>
<tr>
<td>9</td>
<td>Editing with Symbols,</td>
</tr>
<tr>
<td>10</td>
<td>Topology</td>
</tr>
<tr>
<td>11</td>
<td>Offsetting, composing, block building,</td>
</tr>
<tr>
<td>12</td>
<td>Database creation. Inserting title, scale, legend, grids, Insert maps, north arrows and exporting to raster.</td>
</tr>
<tr>
<td>13</td>
<td>Preparation of Plot Map set</td>
</tr>
<tr>
<td>14</td>
<td>Quality Checking (QC)</td>
</tr>
<tr>
<td>15</td>
<td>Final output, importing and exporting.</td>
</tr>
</tbody>
</table>

References:

1. AutoCad Drafting Package, Autodesk INC, 2003

Web resources
11. www.tsa-uk.org.uk/for-clients/guidance-notes/
13. www.southinstrument.com/
14. www.ngs.noaa.gov/
15. https://www.aagsmo.org/
### III SEMESTER
### Practical: 3.5 Web GIS

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise (Total 52 Hrs)</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction Bhuvan ISRO Software</td>
</tr>
<tr>
<td>2</td>
<td>Bhuvan 2D and 3D</td>
</tr>
<tr>
<td>3</td>
<td>Downloading free data from the server</td>
</tr>
<tr>
<td>4</td>
<td>Creating GIS Maps</td>
</tr>
<tr>
<td>5</td>
<td>Creating Point, Line and Polygon Layers</td>
</tr>
<tr>
<td>6</td>
<td>Creating attributes</td>
</tr>
<tr>
<td>7</td>
<td>Labeling the attributes</td>
</tr>
<tr>
<td>8</td>
<td>Online line shape file creations</td>
</tr>
<tr>
<td>9</td>
<td>Map output</td>
</tr>
<tr>
<td>10</td>
<td>Special Applications in Bhuvan</td>
</tr>
<tr>
<td>11</td>
<td>Smart Tracking</td>
</tr>
<tr>
<td>12</td>
<td>Thematic Services</td>
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<td>13</td>
<td>Disasters Services</td>
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<tr>
<td>14</td>
<td>Ocean Services</td>
</tr>
<tr>
<td>15</td>
<td>Bhuvan Panchayath Portal</td>
</tr>
</tbody>
</table>

### References:
5. bhuvan.nrsc.gov.in/disaster
7. bhuvan.nrsc.gov.in/data

### Web resource
10. gis.co.humboldt.ca.us/
12. www.webgis.com/
13. https://www.webgis.net/nc/montgomery/
14. www.co.santa-cruz.ca.us › Departments
15. https://www.webgis.gov.sc/
### III Semester
#### Practical: 3.6 Remote Sensing Lab-3

**Teaching Hour:** 52 hrs

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise (Total 52 Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Computing Image Statistics Using ERDAS' IMAGINE Model Maker</td>
</tr>
<tr>
<td>2</td>
<td>Re-projection the Imagery – Geo-Lat and Long to UTM</td>
</tr>
<tr>
<td>3</td>
<td>Resolution Merge</td>
</tr>
<tr>
<td>4</td>
<td>Contrast Manipulation, Spatial Feature Manipulation, Multi-image Manipulation</td>
</tr>
<tr>
<td>5</td>
<td><strong>Spatial Enhancement</strong> - Convolution, Focal Analysis, Adaptive and Statistical Filter</td>
</tr>
<tr>
<td>6</td>
<td><strong>Radiometric Enhancement</strong> - Histogram Equalization, Histogram Match, Brightness Inversion, Haze Reduction, Noise Reduction</td>
</tr>
<tr>
<td>7</td>
<td><strong>Spectral Enhancement</strong> – Principal Components, Inverse Principal Components, Indices, Landsat 7 Reflectance</td>
</tr>
<tr>
<td>8</td>
<td>Hyper-spectral Image Analysis</td>
</tr>
<tr>
<td>9</td>
<td>Change Detection</td>
</tr>
<tr>
<td>10</td>
<td>Fourier Analysis</td>
</tr>
<tr>
<td>11</td>
<td>DEM - Topographic Analysis – DEM Height Converter</td>
</tr>
<tr>
<td>12</td>
<td>Conversions: ASCII, Vector to Raster, Raster to Vector and Others.</td>
</tr>
<tr>
<td>13</td>
<td>Vector Utilities</td>
</tr>
<tr>
<td>14</td>
<td>Virtual GIS</td>
</tr>
<tr>
<td>15</td>
<td>Advanced Map Composer</td>
</tr>
</tbody>
</table>

**References:**

6. Peter M. Atkinson & Nicholas Tate, (2012), Advances in Remote Sensing and GIS Analysis, Wiley India Pvt Ltd

**Web resources**

18. [bhuvan.nrsc.gov.in/](http://bhuvan.nrsc.gov.in/)
### III Semester
#### Practical: 3.7 GIS Lab-3

<table>
<thead>
<tr>
<th>Exercise No</th>
<th>Title of the Exercise (Total 52 Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overlay Analysis from Selected Layers</td>
</tr>
<tr>
<td>2</td>
<td>TIN from Contour</td>
</tr>
<tr>
<td>3</td>
<td>Buffer Analysis and Proximity analysis</td>
</tr>
<tr>
<td>4</td>
<td>Calculating Nearest Neighbor Point in GIS</td>
</tr>
<tr>
<td>5</td>
<td>Identification of Point and Line Density</td>
</tr>
<tr>
<td>6</td>
<td>DEM to understand the Surface elevation</td>
</tr>
<tr>
<td>7</td>
<td>Conversions - format change</td>
</tr>
<tr>
<td>8</td>
<td>Working with Analysis Tools Clip and Extract</td>
</tr>
<tr>
<td>9</td>
<td>Topology Creation for MDB Layers</td>
</tr>
<tr>
<td>10</td>
<td>Re-projection – Raster and Vector Layers Class</td>
</tr>
<tr>
<td>11</td>
<td>Spatial Adjustments and adjoining features</td>
</tr>
<tr>
<td>12</td>
<td>Data Management Tools</td>
</tr>
<tr>
<td>13</td>
<td>Hydrology and Water Resources</td>
</tr>
<tr>
<td>14</td>
<td>GPS Data Extraction</td>
</tr>
<tr>
<td>15</td>
<td>Model Creations using customize software</td>
</tr>
</tbody>
</table>

#### References:

#### Web resources
11. [www.qgis.org/](http://www.qgis.org/)
12. [www.gisgeography.com › Software](http://www.gisgeography.com › Software)
13. [https://grass.osgeo.or](https://grass.osgeo.or)
III SEMESTER
Paper 3.8: Geography for All
Teaching Hour: 52 hrs

Unit 1

Unit 2

Unit 3

Unit 4

References:
2. Alka Gautam (2009) Geography of India, Sharada pustak bhawan, University Road, Allahabad – UP.

Web Resources:
13. www.roebuckclasses.com › Orientation › Lectures
IV SEMESTER
Practical: 4.1 Project Work

1. The students of M.Sc GISc 4th Semester may have to be selected a specific topic for a Project Work. The students may select some of the following themes for their project.
   a. Land Evaluation
   b. Land-use / Land cover Analysis
   c. Water Sources
   d. Slope Studies
   e. Climatic Change
   f. Settlement Studies
   g. Agriculture Studies
   h. Health Studies
   i. Infrastructure Studies
   j. Vegetation Studies

2. GIS, GPS & RS methods have to be used with appropriate primary and secondary data.

3. The students should follow the research guidelines by referring Research Methodology before taking up the Project Work.

4. The project should not exceed 50 pages including photos, references and tables.

5. Project work must include quality maps, diagrams and flowcharts.

6. The project report has to be included as given below:
   a) Introduction
   b) Review of literature
   c) Study Area
   d) Data sources
   e) Main Objectives
   f) Materials and Method
   g) Results and Discussion
   h) Conclusion
   i) Photos
   j) References

Above work has to be done with the consultation of the staff-in-charge. Viva-Voce would be conducted at the end.

References:

Web resource:
15. www.ccrm.in
**IV Semester**
**Paper: 4.2 Internship**

Internships are done in a Government, research and implementation institution and / or a Private, Corporate institution of repute with specialization on the technologies of Cartography, Remote Sensing, GIS and GPS, including Computer work in a prestigious lab.

**IV Semester**
**Practical: 4.3 Field Study Tour**

Field Study Tour is a part of curricula in M.Sc. IV Semester. Study tour is compulsory and to be conducted between end of the III Semester and in the beginning of the IV Semester for a duration of two weeks. Study tour report submission is compulsory. Students are required to go to the Field Study Tour which is an exploratory topic of geographic importance based on empirical evidences.

At least five places of geographical importance in India like Western Ghats, Aravali Range, Coastal Area, Northwestern Desert, Northern Plain and Himalyan Region and cities located in these regions have to be selected and visited. The detailed geographical, geological, environmental factors for these regions have to be explained. Students need to study environmental impacts of major cities located in these regions. The tour report has to be done with the consultation of the staff-in-charge and has to be submitted to the department at the time of 4th semester examination. Viva-Voice based on study tour report would be conducted at the end.

**References:**