# Course outline of the three week training program in Geospatial Technologies

| Time | Topic | Mode of delivery |
|---|---|---|
| **Day 1** | | |
| 0800-0900 hrs | Registration | |
| 0900-1030 hrs | Inauguration ( with plenary talk by well known expert) | |
| 1030-1100 hrs | Hi tea | |
| 1100-1200 hrs | **1.1** Introduction of the group (trainers and trainees) | Introduce through activity |
| | Expectations from the training program<br>(Get expectations from the audience)<br>Making groups for reporting, grading of the course | Use flipcharts and let participants write their expectation as key words ( this should be kept in the training room and participants should be asked to relook at this at the end of the program to see if their expectations have been met). |
| 1200-1300 hrs | **1.2** Geospatial Sciences: What, why and how??<br>Moving from data to information | Ppt and<br>(use video http://video.esri.com/watch/2536/a-national-gis-for-indias-development-with-sam-pitroda)<br>http://video.esri.com/watch/2502/gis-transforming-our-world-with-jack-dangermond |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **1.3** Introduction to data types in geospatial information (GI):<br>• Overview of spatial and non spatial data types (aerial photos, remote sensing, toposheets, databases, etc.) | Interactive talk/discussion using audio visual |

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|---|---|---|
| | • Overview of data sources | |
| 1600-1630 hrs | Tea break | |
| 1630-1800 hrs | **1.4** Exercise 1: Acquiring data (capture)<br>(Downloading of ASTER, MODIS, Bhuvan, acquiring toposheets from SOI, ordering of IRS data, acquiring secondary data) | Ppt of download demo with follow up exercise for participants to download specific data.<br>Interactive talk /discussion on data types and data sources using audio-visual |
| 1800-1815 hrs | **1.5** Filling in feedback forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback.<br>Ideally to be fed in by the participant in electronic form. |

| **Day 2** | | |
|---|---|---|
| 0900-0930 hrs | **2.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) – led by Coordinator | Presentation of quantitative feedback from the participants |
| 0930-1300 hrs | **2.2** Understanding scales and projections<br>a. Scales<br>b. Projections<br>c. (with tea break) | Interactive talk/discussion with audio-visual /power point with short exercises to break monotony |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **2.3** Ex. Overview of QGIS (Use IGET_GIS_001) | Lab session (hands on in the lab led by instructor) |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | **2.4** Ex. Working with projections using QGIS ( use IGET_GIS_002)<br>• Using existing projection<br>• Making a new projection<br>• Importing a projection | Use instruction and data from IGET<br>Student to make a file of their outputs |
| 1800-1815 hrs | **2.5** Fill in feedback forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback.<br>Ideally to be fed in by the participant in electronic form |

| **Day 3** | | |
|---|---|---|
| 0900-0930 hrs | **3.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) led by Coordinator | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **3.2** Understanding data quality<br>• Elements of data quality<br>• Sources and types of errors in geospatial data building<br>• Importance of metadata | Interactive talk/discussion with power point |
| 1100-1130 hrs | Tea | |
| 1130-1300 hrs | **3.3** Extracting data - georeferencing and extraction of data | Interactive talk/discussion with power point and demo |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **3.4** Ex: Georefrencing ( Use IGET_GIS_003 ) | Students should file output in their respective folders |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | **3.5** Ex: Extracting data (Use IGET_GIS_004) | Students should file output in their respective folders |
| 1800-1830 hrs | **3.6** Fill in feedback forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 4** | | |
|---|---|---|
| 0900-0930 hrs | **4.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) led by Coordinator | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **4.2** Understanding map making<br>• Cartographic evolution<br>• Map classification<br>• Map elements<br>• Principles of map design | Interactive talk/discussion with power point |
| 1000-1130 hrs | Tea break | |
| 1130-1300 hrs | **4.3** Group exercise on analysis of good and bad maps with reasons (to be based on map design principles)<br>Group work and presentation | Using 'Position Bar' method |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **4.4** Ex: Map preparation (Use IGET_GIS_006) | Students should file output in their respective folders |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | Continue with ex. (IGET_GIS_006) | Instructor should do a group analysis of map design done by the students |
| 1800-1815 hrs | Fill in Feedback Forms | Groups of participants will report over the duration of the training. |

| **Day 5** | | |
|---|---|---|
| 0900-0930 hrs | **5.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative)- led by coordinator | Presentation of quantitative feedback from the participants |
| 0930-1300 hrs<br>With tea break | **5.2** Understanding attribute data<br>• Importance of database<br>• Database management systems<br>• Building attribute data | Interactive talk/discussion with power point |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **5.3** Ex: Data exploration (Use IGET_GIS_007) | Students should be encouraged to explore tables and present specific information form tables |
| 1600-1630 hrs | Tea break | |
| 1630-1800 hrs | **5.4** Ex: Working with tables (use IGET_GIS_008) | |
| 1800-1815 hrs | **5.5** Fill in Feedback Forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 6** | | |
|---|---|---|
| 0900-0930 hrs | **6.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) – led by coordinator | Presentation of quantitative feedback from the participants |
| 0930-1300 hrs<br>(with tea break) | **6.2** Visualizing data through queries | Interactive talk/discussion with power point with demos |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **6.3** Ex: Working with queries (use IGET_GIS_009) | |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | **6.4** Ex: Working with queries (IGET_GIS_010) | |
| 1800-18.15 hrs | **6.5** Feedback | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 7** | | |
|---|---|---|
| 0900-0930 hrs | **7.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **7.2** Introduction to GPS | Interactive talk/discussion with power point and demo |
| 1100-1130 hrs | Tea | |
| 1130-1300 hrs | **7.3** Ex: Field exercise for collecting points using GPS | |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **7.4** Ex : Importing GPS data into QGIS (Use IGET_GIS_011) | |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | 7.5 Ex: Using Google Earth / Bhuvan (Use IGET_GIS_012) | |
| 1800-1815 hrs | Fill in Feedback Forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 8** | | |
|---|---|---|
| 0900-0930 hrs | **8.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **8.2**: Types of remote sensing | Multispectral, thermal, microwave, hyperspectral, LIDAR (20 min each) with differences<br>Interactive talk/discussion with power point /Invited speakers |
| 1100-1130 hrs | Tea | |
| 1130-1300 hrs | **8.3** Applications of remote sensing | Must deal with case studies using different types of remote sensing<br>Interactive talk/discussion with power point and invited speakers |
| 1300-1400 hrs | Lunch | |
| 1400-1800 hrs<br>With tea break | **8.4** Ex: Intro to SAGA (Use IGET_RS_001) | Interactive talk/discussion with power point and lab demo |
| 1800-1815 hrs | **8.5** Fill in Feedback Forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 9** | | |
|---|---|---|
| 0900-0930 hrs | **9.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **9.2** Understanding the image – elements of visual interpretation | Interactive talk/discussion with power point with examples |
| 1100-1130 hrs | Tea break | |
| 1130-1300 hrs | **9.3** Understanding the image -understanding image statistics | Interactive talk/discussion with power point with examples |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **9.4** Ex: Image interpretation (Use IGET_RS_002) | |
| 1600-1630 hrs | Tea break | |
| 1630-1800 hrs | **9.5** Ex: Understanding the image (histogram) (Use IGET_RS_003) | |
| 1800-1815 hrs | **9.6** Fill in Feedback | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 10** | | |
|---|---|---|
| 0900-0930 hrs | **10.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **10.2** Geometric correction | Interactive talk/discussion with power point |
| 1100-1130 hrs | Tea break | |
| 1130-1300 hrs | **10.3** Atmospheric and Radiometric corrections | Interactive talk/discussion with power point |
| 1300-1400 hrs | Lunch | |
| 1400-1800 hrs<br>With tea break | **10.4** Ex: Image registration (use IGET_RS_0004) | |
| 1800-1815 hrs | Fill in Feedback Form | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 11** | | |
|---|---|---|
| 0900-0930 hrs | **11.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1300 hrs<br>With tea break | **11.2:** Introduction to image enhancements<br>• Contrast enhancements<br>• Band rationing<br>• Spatial filtering<br>• Principal Components Analysis<br>• Vegetation Indices | Interactive talk/discussion with power point with examples/ videos<br>Invited speakers |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **11.3** Ex: Working with images – subsetting and mosaicking (Use IGET_RS_005) | |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | **11.4** Ex: Using enhancements (use IGET_RS_006 ) | |
| 1800-1815 hrs | Fill in Feedback Forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 12** | | |
|---|---|---|
| 0900-0930 hrs | **12.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **12.2** Introduction to image classification: Unsupervised | Interactive talk/discussion with power point |
| 1100-1130 hrs | Tea break | |
| 1130-1300 hrs | **12.3** Introduction to image classification: Supervised | Interactive talk/discussion with power point |
| 1300-1400 hrs | Lunch | |
| 1400-1800 hrs<br>With tea break | **12.4** Ex: Extracting information for satellite image using unsupervised classification (Use IGET_RS_007 ) | Output in the form of a map |
| 1800-1815 hrs | **12.5** Fill in Feedback Forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 13** | | |
|---|---|---|
| 0900-0930 hrs | **13.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **13.2** Accuracy assessment : why and how | Interactive talk/discussion with power point with examples |
| 1100-1130 hrs | Tea break | |
| 1130-1600 hrs<br>With lunch break | **13.3** Ex: Extracting information for satellite image using supervised classification (Use IGET_RS_008 ) | |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | **13.4** Ex: Accuracy assessment (Use IGET_RS_009) | |
| 6.00-6.15 | **13.5** Fill in Feedback forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 14** | | |
|---|---|---|
| 0900-0930 hrs | **14.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **14.2** Change detection | Interactive talk/discussion with power point /invited speaker |
| 1100-1130 hrs | Tea | |
| 1130-1300 hrs | **14.3** Understanding terrain data | Interactive talk/discussion with power point |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **14.4** Ex: Terrain analysis (Use IGET_RS_010) | |
| 1600-1630 hrs | Tea break | |
| 1630-1800 hrs | **14.5** Ex: Change detection with SAGA (use IGET_RS_011) | |
| 1800-1815 hrs | **14.6** Fill in Feedback forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 15** | | |
|---|---|---|
| 0900-0930 hrs | **15.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1300 hrs<br>With tea break | **15.2** Spatial data analysis | Interactive talk/discussion with power point /Invited Speaker |
| 1300-1400 hrs | Lunch | |
| 1400-1800 hrs<br>With tea break | **15.3** Exercise on spatial data analysis (Use IGET_SA_001) | |
| 1800-1815 hrs | **15.4** Feedback | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 16** | | |
|---|---|---|
| 0900-0930 hrs | 16.1 Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | 16.2 Introduction to PostGRE/PostGIS and demos | |
| 1100-1130 hrs | Tea | |
| 1130-1300 hrs | 16.3 Understanding Geoserver –Open layer, web services and demos | |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | 16.4 Catalogue Services -Geonetwork | |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | 16.5 Exercise Using PostGRE/PostGIS (use IGET_____) | |
| 1800-1815 hrs | 16.6 Feedback | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 17** | | |
|---|---|---|
| 0900-0930 hrs | **17.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1100 hrs | **17.2** Applications on RS/GIS in planning (urban/rural) with specific case studies highlighting detailed methodology | Guest lectures |
| 1100-1130 hrs | Tea | |
| 1130-1300 hrs | **17.3** Applications of RS/GIS in natural resource management (forest, wildlife/agriculture/watershed) with specific case studies highlighting detailed methodology | Guest lectures |
| 1300-1400 hrs | Lunch | |
| 1400-1600 hrs | **17.4** Applications of RS/GIS in climate studies with specific case studies highlighting detailed methodology | Guest lectures |
| 1600-1630 hrs | Tea | |
| 1630-1800 hrs | **17.5** Group exercise: Participants to make a methodology flow chart for given applications | 6-7 applications to be given |
| 1800-1815 hrs | **17.6** Feedback | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 18** | | |
|---|---|---|
| 0900-0930 hrs | **18.1** Feedback (analysis to be done by participants and presented – quantitative and qualitative) | Presentation of quantitative feedback from the participants |
| 0930-1300<br>With tea break | **18.2** Discussion of possible minor projects to be done by the participants. Institutions to give projects according to data available with them or using data that can be generated easily. | List needed |
| 1300-1400 hrs | Lunch | |
| 1400-1800 hrs<br>With tea break | **18.3** Working on projects | |
| 1800-1815 hrs | **18.4** Filling in feedback forms | Groups of participants will report over the duration of the training with one participant responsible within each group to get feedback. |

| **Day 19** | | |
|---|---|---|
| 09.00-18.00 | Working on projects | |

| **Day 20** | | |
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| 09.00-18.00 | Working on projects | |

| **Day 21** | | |
|---|---|---|
| 0900-1300 hrs | Final project presentation by participants (groupwise) including tea break | |
| | | |
| 1300-1400 hrs | Lunch | |
| 1400-1530 hrs | Feedback and Valedictory | |