

BIRLA INSTITUTE OF TECHNOLOGY



CHOICE BASED CREDIT SYSTEM (CBCS) CURRICULUM

(Effective from Academic Session: Monsoon 2018)

M. TECH REMOTE SENSING

DEPARTMENT OF REMOTE SENSING

Institute Vision

To become a Globally Recognised Academic Institution in consonance with the social, economic and ecological environment, striving continuously for excellence in education, research, and technological service to the National needs.

Institute Mission

- To educate students at Under Graduate, Post Graduate, Doctoral, and Post-Doctoral levels to perform challenging engineering and managerial jobs in industry.
- To provide excellent research and development facilities to take up Ph.D. programmes and research projects.
- To develop effective teaching learning skills and state of art research potential of the faculty.
- To build national capabilities in technology, education, and research in emerging areas.
- To provide excellent technological services to satisfy the requirements of the industry and overall academic needs of society.

Department Vision:

Be a centre of excellence in the field of Geo-spatial Technology education and research to meet the needs of ever increasing requirement of human resources in these fields and to cater to the larger interest of the Society and Nation.

Department Mission

Impart quality education and equip the students with strong foundation that could make them capable of handling challenges of the ever advancing geo-spatial technologies.

Maintain state-of-the-art in research and outreach facilities in phase with the premier institutions for sustained improvement in the quality of education and research.

Programme Educational Objectives (PEOs)

1. To prepare the students in identifying, analysing and solving geospatial problems.
2. To train the students in developing practical and executable solutions to the challenges of growing field of Remote Sensing and GIS.
3. To impart the students with strong base of knowledge that makes them suitable both for industries as well as for teaching and research.
4. To inculcate the students with the sensitivity towards ethics, public policies and their responsibilities towards the society.

Programme Outcomes (POs)

PO1: An ability to independently carry out research /investigation and development work to solve real life geospatial problems.

PO2: An ability to write and present a substantial technical report/document and publish international level research articles.

PO3: Students should be able to demonstrate a degree of mastery over the areas of Remote Sensing and GIS technology. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

PO4: An ability to share theoretical and practical knowledge in both teaching and research as well as in industries.

PO5: An ability to apply professional ethics, accountability and equity.

PROGRAMME COURSE STRUCTURE

SEMESTER - I

| SEMESTER-I | Course Category | Course Code | Subjects | L | T | P | Credit |
|------------|--|----------------------|--|---|---|---|--------|
| | PC | RS 501 | Principles of Remote Sensing and Digital Satellite Image Processing | 3 | 0 | 0 | 3 |
| | | RS 502 | Geographic Information System and Satellite Navigation System | 3 | 0 | 0 | 3 |
| | | RS 503 | Remote Sensing and Digital Satellite Image Processing Laboratory | 0 | 0 | 4 | 2 |
| | | RS 504 | Geographic Information System & Satellite Navigation System Laboratory | 0 | 0 | 4 | 2 |
| | PE | RS * | ELECTIVE – I | 3 | 0 | 0 | 3 |
| | | RS * | ELECTIVE – I Laboratory | 0 | 0 | 4 | 2 |
| | OE | OPEN ELECTIVE | | 3 | 0 | 0 | 3 |
| | Total Credits (1 st Semester) | | | | | | |

SEMESTER – II

| SEMESTER-II | Course Category | Course Code | Subjects | L | T | P | Credit |
|--|-----------------|----------------------|---|---|---|---|-----------|
| | PC | RS 511 | Aerial and Satellite Photogrammetry & Image Interpretation | 3 | 0 | 0 | 3 |
| | | RS 512 | Advanced Remote Sensing and Geospatial Modelling | 3 | 1 | 0 | 4 |
| | | RS 513 | Aerial and Satellite Photogrammetry & Image Interpretation Laboratory | 0 | 0 | 4 | 2 |
| | | RS 514 | Advanced Remote Sensing and Geospatial Modelling Laboratory | 0 | 0 | 4 | 2 |
| | | RS 515 | Programming and Customisation in geospatial domain Laboratory | 0 | 0 | 4 | 2 |
| | PE | RS * | ELECTIVE – II | 3 | 0 | 0 | 3 |
| | | RS * | ELECTIVE – II Laboratory | 0 | 0 | 4 | 2 |
| | OE | OPEN ELECTIVE | | 3 | 0 | 0 | 3 |
| Total Credits (2 nd Semester) | | | | | | | 21 |

SEMESTER – III

| SEMESTER-III | Course Category | Course Code | Subjects | L | T | P | Credit | |
|--------------|--|---|--|---|---|---|--------|-----------|
| | PC | RS 601 | Thesis (Part – I) | | | | | 8 |
| | | RS 602 | Data Sources, Statistics and Research Methods in Geospatial Domain | 3 | 1 | 0 | | 4 |
| | OE | OPEN ELECTIVE / MOOC (excluding already taken courses) | | 3 | 0 | 0 | | 3 |
| | Total Credits (3 rd Semester) | | | | | | | 15 |

SEMESTER – IV

| SEMESTER-IV | Course Category | Course Code | Subjects | L | T | P | Credit | |
|-------------|--|-------------|--------------------|---|---|---|--------|-----------|
| | PC | RS 604 | Thesis (Part – II) | | | | | 16 |
| | Total Credits (4 th Semester) | | | | | | | 16 |

TOTAL = 70 credits

*ELECTIVE SUBJECTS

Course No.

Course Title

PE-I (Semester-I)

| | |
|--------|--|
| RS 505 | Remote Sensing in Agriculture & Forestry |
| RS 506 | Remote Sensing in Disaster Management |
| RS 507 | Remote Sensing in Hydrology & Water Resources |
| RS 508 | Remote Sensing in Agriculture & Forestry Laboratory |
| RS 509 | Remote Sensing in Disaster Management Laboratory |
| RS 510 | Remote Sensing in Hydrology & Water Resources Laboratory |

PE-II (Semester- II)

| | |
|--------|---|
| RS 516 | Remote Sensing in Snow and Glacier Hydrology |
| RS 517 | Remote Sensing in Climate Change and Environmental Impact Assessment |
| RS 518 | Remote Sensing in Snow and Glacier Hydrology Laboratory |
| RS 519 | Remote Sensing in Climate Change and Environmental Impact Assessment Laboratory |

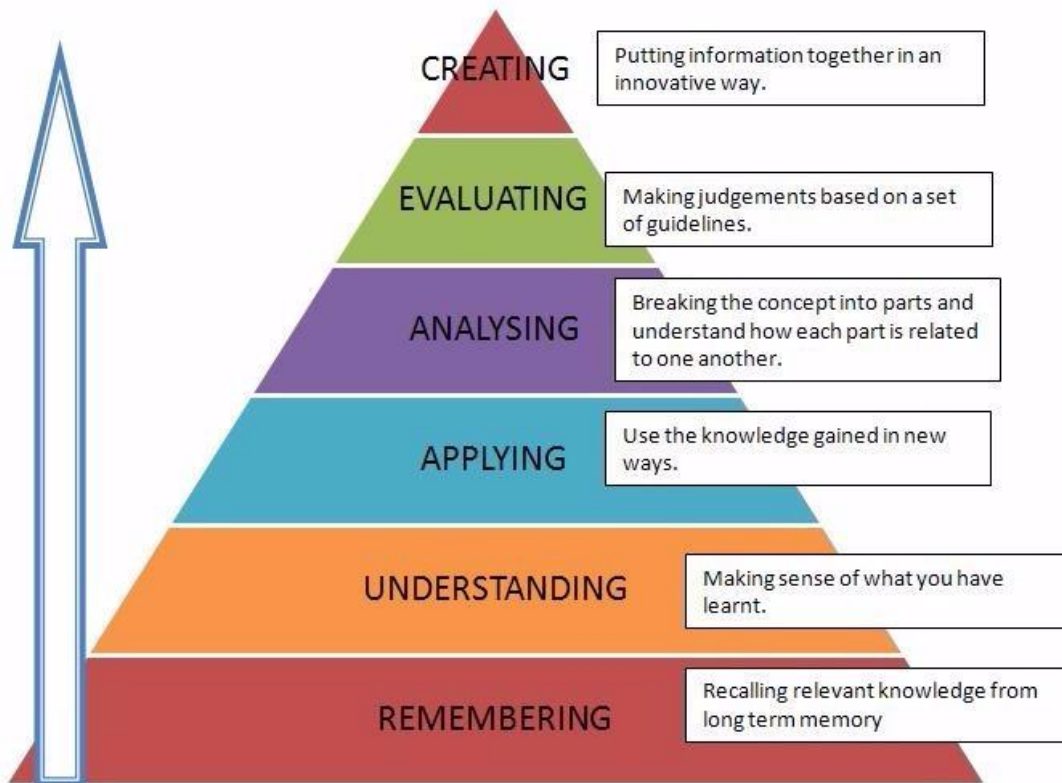
Thesis (Part – I) – Focus on Problem definition, Literature Review, Data Collection, Objectives and Research Questions Formulation and Detailed Work Plan, and partial fulfillment of initial objectives.

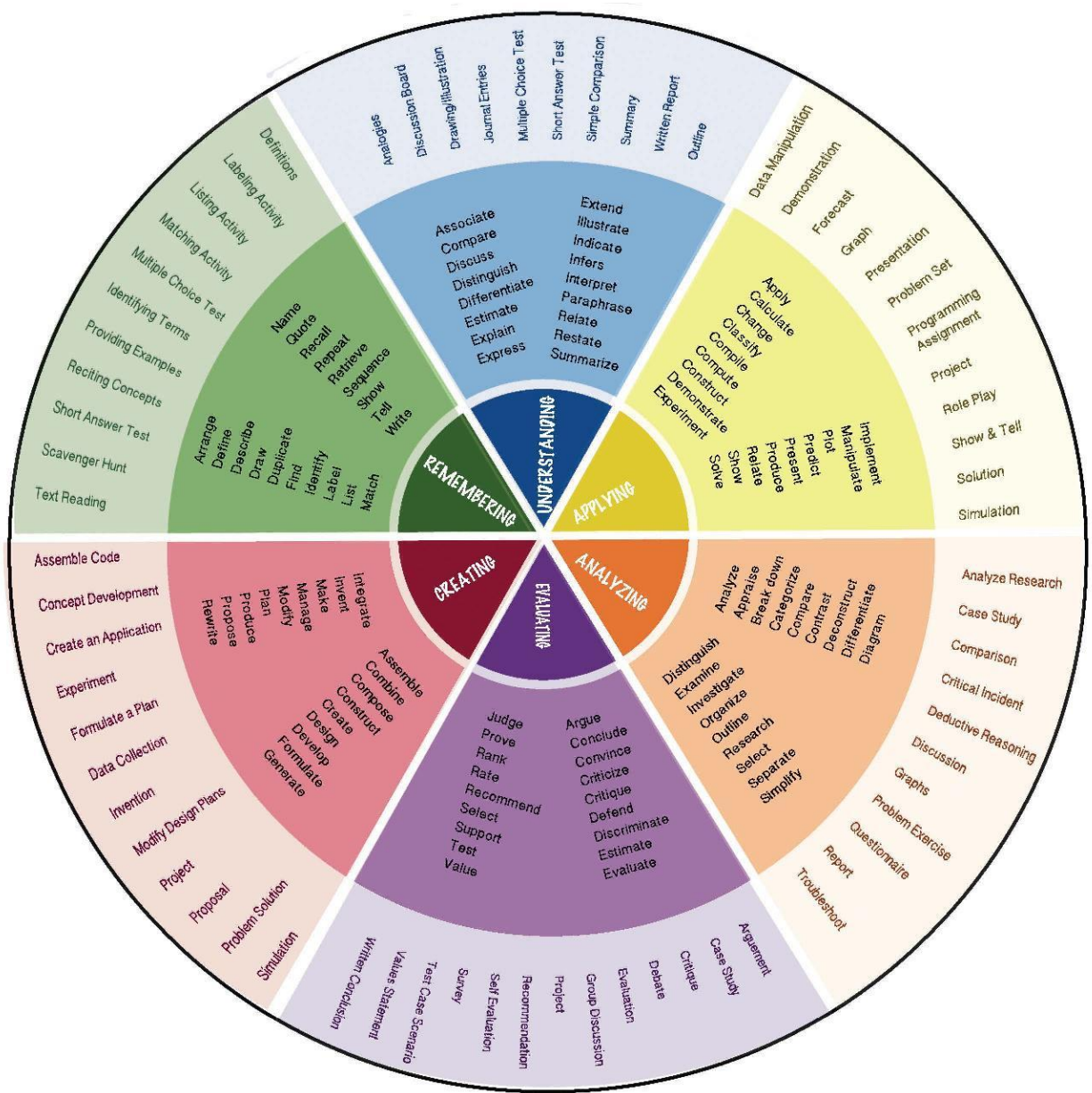
Thesis (Part – II) – Focus on systematic execution of work plan, data processing, analysis, interpretation, inferences and fulfillment of objectives and research questions, and report preparation, and finally leading to a research publication in peer reviewed journals.

BLOOM'S TAXONOMY FOR CURRICULUM DESIGN AND ASSESSMENT:

Preamble

The design of curriculum and assessment is based on Bloom's Taxonomy. A comprehensive guideline for using Bloom's Taxonomy is given below for reference.





COURSE INFORMATION SHEET

SEMSETER IV

Course code: RS 601 & RS 604

Course title: RESEARCH PROJECT (Thesis Part I and II)

Pre-requisite(s): Completion of all Labs of 1st and 2nd semester

Co- requisite(s):

| | | | | |
|-----------------|-----------|-----------|-----------|-----------|
| Credits: | L: | T: | P: | C: |
| | 0 | 0 | | 8+16 |

Class schedule per week: 4

Class: M. TECH

Semester / Level: 03&04/06

Branch: REMOTE SENSING

Course Objectives:

This course aims to make the student with following abilities:

| | |
|----|---|
| A. | Carry out Independent Research Project addressing real life geospatial problems with sound scientific framework. |
| B. | Prepare thematic and topographic maps from satellite data and other sources, and Utilise various Geospatial processing and modelling techniques and Create research report with acceptable quality and ethics, and communicate results to stakeholders. |

Course Outcomes:

On completion of this course, students should be able to:

| | |
|------------|---|
| CO1 | Identify, Collect, Compare, evaluate and summarise relevant existing literatures related to the problem in hand. |
| CO2 | Identify Research Gaps, Develop appropriate research questions and Objectives in relation to their domain of research. |
| CO3 | Design Research Strategy and Methodology and Create coherent geospatial database and other relevant data for each objective. |
| CO4 | Apply Geospatial, Geostatistical, Statistical tools and techniques, and evaluate the appropriateness of results in relation to objectives and research questions. |
| CO5 | Integrate, interpret and synthesis all results and write a scientifically sound academic report with appropriate referencing, and communicate research findings to stakeholders and in peer reviewed journal/conferences. |

Mapping Course Outcome with Programme Outcome

| | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|------------|------------|------------|------------|------------|
| CO1 | 1 | 2 | 2 | 3 | 3 |
| CO2 | 2 | 3 | 2 | 2 | 3 |
| CO3 | 3 | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 2 | 1 |
| CO5 | 3 | 3 | 3 | 3 | 3 |

Correlation Levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)