

*University of Kota*  
*Kota*



Diploma in  
Remote Sensing and GIS

**SYLLABUS**

2016

**Diploma in Remote Sensing And GIS**  
**(DRSGIS) Exam.-2016**

Title of the Course:

**Diploma in Remote Sensing And GIS**

Duration of the course:

Diploma in Remote Sensing And GIS will be of One academic year duration.

Proposed Year of Implementation:

From the Academic Session 2009-2010.

Nature of the course :

Regular & Professional

Medium of Instructions:

English/Hindi

Course Contents:

There will be 3 Theory papers, 1 Practical and 1 Assignment Submission. The Student will undertake one Assignment (approx. 20-30 pages) related to the Subject Papers and submit it for evaluation by internal Examiner. External examiner will also be appointed with internal examiner for practical examination.

**Nomenclature of the Papers:**

Paper-I - Fundamentals of Remote Sensing	(M.M. 100)
Paper II - Fundamentals of Aerial Photography	(M.M. 100)
Paper III - Fundamentals of Geographical Information System	(M.M. 100)
Paper IV - Practical	(M.M. 150)
• Assignment Submission	(M.M. 50)

Total – 500 Marks

#### Scheme of Examination:

- a) A candidate must obtain for a pass (i) at least 36% marks of the aggregate marks in all the papers prescribed at the examination, and (ii) at least 36% marks in practical and Assignment work at the examination: provided that if a candidate fails to secure 25% marks in each individual paper of theory examination, he/she shall be deemed to have failed at the examination, notwithstanding his / her having obtained the minimum % of marks required in the aggregate for the examination. Division will be awarded at the end of course duration, of the combined marks as noted below:  
First Division: 60% marks  
Second Division: 48% marks  
Third Division: 36% marks
- b) If a candidate obtains less than 25% marks in up to two of the theory papers of the examination, but has secured aggregate 36% marks then in such case the paper(s) in which he/she secured less than 25% marks will be considered as due paper(s) and the candidate has to pass them in the supplementary examination, failing which, the candidate will be declared failed and shall appear as an Ex-student at the next yearly Examination.
- c) The minimum attendance required by the candidate will be as per University rules.

#### Eligibility of the Candidate for admission of the Course:

Graduation in any discipline with marks, 50% agg. in graduation, 45% for SC/ST/OBC  
Selection : Through Common Merit list to be Declared by University of Kota.  
Reservation: As per Govt. rules.

#### Examination Scheme:

##### Annual

Paper code	Paper name	Duration		Maximum Marks
		lecture(hrs), per week	Exam(hrs)	Max
	<b>Fundamentals of Remote sensing</b>	3	3	100
	<b>Fundamentals of Aerial Photography</b>	3	3	100
	<b>Fundamentals of Geographical Information System</b>	3	3	100
	<b>Practical</b>	4	4	150
	Assignment Submission			50
	<b>Total</b>			<b>500</b>

#### Marking Scheme of Examination:

- Each theory paper shall be of 100 Marks (examination of 3 hours duration)
- Practical paper shall be of 150 marks (examination of 4 hours duration).
- Assignment is to be submitted before theory Examination for internal evaluation shall be of 50 Marks.

Duration of Theory & Practical Periods / Week:

Theory 3 hours/ Week for each paper and Practical 4 hours / Week

Assignment work:

- Assignment will be related to the course content and will be prepared under the supervision of the concerned teacher, by the student.
- Assignment is to be submitted before theory Examination.
- Assignment is must be submitted before the last date notified by the HOD/Course in charge.
- The candidate who fails to submit the Assignment within stipulated time, he /she will be awarded zero marks for the Assignment .

**Paper scheme:**

For **Theory** Paper- 100 MM

The question paper will contain three sections as under-

Section-A: One compulsory question with 10 parts, having parts from each unit, short answer in Approx. 20 words/ objective type for each part.(10 MM)

Section-B: 5 Question out of 10 is to be attempt, having parts from each unit, answer Approx. 250 words for each part.(50 MM)

Section-c: 2 Questions out of 4 is to be attempt, descriptive type , answer in Approx. 500 words. (40 MM)

**Paper scheme:**

For **Practical** Paper- 150 MM

The question paper will contain as under-

written Paper With laboratory work of 4 hours duration

5 questions out of 7 is to be attempt (80 MM)

Record work (50 MM) ,Viva-Voce (20 MM) : 1 hours duration

Note :External examiner will also be appointed with internal examiner for practical examination

**scheme For Assignment - 50 MM.**

Student will Prepare one Assignment (approx. 20-30 pages) related to the Subject Papers and submit it before Exam for evaluation by internal Examiner.

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## **PARER-I - Fundamentals of Remote Sensing**

Paper scheme:

Theory Paper- 100 MM

Duration: 3 hours

The question paper will contain three sections as under-

**Section-A: One compulsory question with 10 parts, having parts from each unit, short answer in Approx. 20 words/ objective type for each part. (10 MM)**

**Section-B: 5 Question out of 10 is to be attempt, having parts from each unit, answer Approx. 250 words for each part. (50 MM)**

**Section-c: 2 Questions out of 4 is to be attempt, descriptive type , answer in Approx. 500 words. (40 MM)**

### Unit-I

Meaning and basic concept of Remote Sensing, Historical development of Remote Sensing, Stages of Remote Sensing, Energy Source and Radiation system, Concept of EMR and signatures.

### Unit-II

Remote Sensing process, Data acquisition and Interpretation Remote Sensing Platforms and Sensors, Landsat Programme, SPOT Programme.

### Unit-III

Digital Image, Digital Image Formats Indian space Programmes, World Space Programmes, Progress in Remote Sensing, Remote Sensing and GIS Integration

### Unit-IV

Artificial Satellites – Geo-Stationary, Sun-Synchronous, Remote Sensing, Advantages and Limitations, Indian remote Sensing System; IRS-LISS, WiFs, PAN. Indian Space Research Programme.

### Unit-V

Image Interpretation and analysis(visual):-

- Physical features - Hills, Rivers (Drainage Pattern), Water Bodies, Land Cover (Forest and vegetation), Soils etc.
- Cultural features -Settlements, Transportation lines, Land-Use etc.

Common terminologies in Remote Sensing.

References:

1. Pratt, W.K. : Digital Image Progressing, Willey, New York,
2. Rao,D.P.(eds.): Remote Sensing for Earth Resources, Association of Exploration, Geophysicist, Hyderabad,
3. Thomas, M. Lillesand & Ralph W. Kefer : Remote Sensing and Image Interpretation, John Willey & Sons, New York,
4. Wolf Paul, K.:Element of Photogrammetry, McGraw Hill Book. Co.
5. Curran P J: Principals of Remote Sensing, London.

## **PARER-II - Fundamentals of Aerial Photography**

Paper scheme:

Theory Paper- 100 MM

Duration: 3 hours

The question paper will contain three sections as under-

**Section-A: One compulsory question with 10 parts, having parts from each unit, short answer in Approx. 20 words/ objective type for each part. (10 MM)**

**Section-B: 5 Question out of 10 is to be attempt, having parts from each unit, answer Approx. 250 words for each part. (50 MM)**

**Section-c: 2 Questions out of 4 is to be attempt, descriptive type , answer in Approx. 500 words. (40 MM)**

### Unit-I

History of Aerial Photography , Types of Aerial Photographs ;Photography from Aerial Platforms ;Vertical Aerial Photography, Oblique Aerial Photography.

### Unit-II

Aerial Cameras, Filters, Films, Overlapping system, Planning Aerial Photography mission, Geometry of Aerial Photograph.

### Unit-III

Quality of Aerial Photographs, Photo Interpretation; Introduction, Elements of Air Photo Interpretation; Location, Size, Shape, Shadow, Tone, Texture, Pattern, Association, Fundamentals of Photogrammetry.

### Unit-IV

Pocket Stereoscope and its uses, Mirror Stereoscope and its uses, Requirements of Photo Interpreter, Comparison of Maps, Topographical Sheets and Aerial Photographs

### Unit-V

Air Photo Interpretation in :

- Physical feature identification- Hills, Rivers(Drainage Pattern), Water Bodies, Land Cover (Forest and vegetation),Soils etc.
- Cultural feature identification-Settlements, Transportation lines, Land-Use etc.

Stereoscopic Vision , Photographic Scale, Area measurement(Calculation of total aerial photograph of an area), types of mosaic.

References:

1. Luder,;Aerial Photography Interpretation : Principles and Application, McGraw Hill, NewYork,
2. Chouhan, T.S. & K.N. Joshi: Applied R.S. and Photo Interpretation, Vigyan Prakashan, Jodhpur.
3. Singh, S.: Remote Sensing Technology, Scientific Publication, Jodhpur

**PAPER-III**  
**Fundamentals of Geographical Information System**

Paper scheme:

Theory Paper- 100 MM

Duration: 3 hours

The question paper will contain three sections as under-

**Section-A: One compulsory question with 10 parts, having parts from each unit, short answer in Approx. 20 words/ objective type for each part. (10 MM)**

**Section-B: 5 Question out of 10 is to be attempt, having parts from each unit, answer Approx. 250 words for each part. (50 MM)**

**Section-c: 2 Questions out of 4 is to be attempt, descriptive type , answer in Approx. 500 words. (40 MM)**

Unit-I

Cartography and Spatial Information, Origin and Development of GIS.  
Components of GIS, Definition, Scope, Objectives and Functions of GIS.

Unit-II

Spatial Data , Elements of Spatial data, Sources of Data; Primary, secondary, Census and Sample Data, Raster and Vector data Structure

Unit-III

Comparison of Raster and Vector Data.; Representation of Spatial Information.  
Progress in GIS; Major application areas; Software's; Users., Introduction to Software: ERDAS imagine

Unit-IV

Introduction of Digital Image Processing and GIS Applications, Data input and editing; Data stream, Multi Spectral image classification- Supervised classification and Unsupervised classification, Cartography, Definition, Scope, History of cartography; Geography as a Spatial Science; Scales of Measurement,

Unit-V

Spatial analysis: Reclassification, Buffering, Overlay analysis , Introduction of GPS; Global Positioning System: GPS Satellite Constellation; Space segment, Control segment, User segment and GPS applications., Quality and Error Variation ,GIS Data formats for Computer environment; Common terminology of GIS

References:

1. Siddiqui MA: Introduction to GIS, Sharda Pustak Bhawan, Allahabad.
2. Bernhardsan T : Geographical Information system, Norway .
3. Burrough & Mc Donnel : Principal of Geographical Information system, Oxford.
4. Anji Reddy: Text book of Remote Sensing and Geographical information System.
5. Arnoff S. : GIS A Management Perspective, Canada.

## Practical

### **Paper scheme:**

For **Practical** Paper- 150 MM

The question paper will contain as under-written Paper With laboratory work of 4 hours duration

5 questions out of 7 is to be attempt (80 MM)

Record work (50 MM ) ,Viva-Voce (20 MM) : 1 hours duration

Note :External examiner will be appointed with internal examiner for practical examination

Basic details of Aerial Photograph, Geometry of Aerial Photograph, Types of Aerial Photographs, Overlapping and Flight Planning, Eye base, Photo Base, Flight line demarcation, Calculation of total Aerial Photograph to cover the Area , Scale Measurements, Aerial Photograph Interpretation, EMR Activity, Stages of Remote sensing, Detail Chart of different Sensors, Basic Details of Imageries, Component of GIS, Over View of GIS, Raster data structure, Vector data structure, Representation of Spatial Information, Desktop Functions of GIS, Visual Interpretation of Aerial Photograph, Use of Mirror Stereoscope, Use of Pocket Stereoscope, Tracing (Interpretation) of Physical features- Hills/Mountains, Rivers, Forests, Soil, Land Cover, Water Body Tracing (Interpretation) of Cultural Features- Land Use, Settlements, Transportation Lines, Field Patterns Making of Stereo gram/Making of Stereo triplet, Visual Interpretation of Satellite Imagery, Physical Features Identification, Cultural Features Identification, Basic Software Application, Ground truth Verification Introduction of software-ERDAS imagine.

### References:

1. Luder,:Aerial Photography Interpretation : Principles and Application,McGrawHill
2. Rao, D.P. (eds.) Remote Sensing for Earth Resources, Association of Exploration, Geophysicist, Hyderabad,
3. Thomas, M. Lillesand & Ralph W. Kefer: Remote Sensing and Image Interpretation, John Willey & Sons, New York,
4. Curran P J: Principals of Remote Sensing, London.
6. Anji Reddy: Text book of Remote Sensing and Geographical information System.
7. Siddiqui MA: Introduction to GIS, Sharda Pustak Bhawan, Allahabad.

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