INSTITUTE OF ADVANCED STUDIES IN EDUCATION

(DEEMED TO BE UNIVERSITY)

GANDHI VIDYA MANDIR, SARDARSHAHR

(CHURU) RAJASTHAN – 331403

Phone – 01564 – 220025, 223642, 223054

Web: www.iaseuniversity.org.in

SYLLABUS

SCHEME OF EXAMINATION AND COURSE OF STUDY

DEPARTMENT OF GEOGRAPHY

FACULTY OF HUMANITIES AND SOCIAL SCIENCES

Skill Course (3Months)

Certificate in Digital Photogrammetry

Course Objectives:

To give the exposure though Practical Learning in Digital Photogrammetry, practical understanding of Digital Photogrammetry and GIS on applications of real world. Our practical assignments and mapping projects are designed by industry experts to get the industry orientated exposure for developing the ability to perform basic analysis on Geospatial Spatial data set.

Learning Outcomes:

After completion of this course candidate will be hands on Geospatial technology as per industry requirements. Candidates would able to perform from the day first.

SCHEME OF EXAMINATION

Theory paper **Marks 80**

Internal Marks **Marks 20**

Note:

1. The number of paper and the maximum marks for each paper practical shall be shown in the syllabus for the subject concerned. It will be necessary for a candidate to pass in the theory part as well as in the practical part (Whenever prescribed) of a subject /paper separately.
2. A candidate for a pass at each of the Previous and the Final Examination shall be required to obtain (i) at least 36% marks in the aggregate of all the paper prescribed for the examination and (ii) at least 40% marks in practical (s) whenever prescribed in the examination provided that a candidate fails to obtain at least 36% marks in each individual paper work. Whenever prescribed, he shall be deemed to have failed at the examination notwithstanding his having obtained the minimum percentage of marks required in the aggregate for the examination. No division shall be awarded at the previous examination. Division shall be awarded at the end of the Final Examination on the basis of combined marks obtained at the Previous and the Final Examination, as noted below:

   First Division **60% of the aggregate marks**
   Second Division **48% of the Examination**
   All the rest shall be declared to have passed the examination.

3. If a candidate clears any .paper(s)-Practical(s)/Dissertation prescribed at the Previous and or/final Examination after a continues period of .three years, then for the purpose of working out his division the minimum pass marks only via 36% (40% in the case of practical) shall be taken into account in respect of such paper(s) Practical(s)/ Dissertation are cleared after the expiry of the aforesaid period of 06 Month, provided that in case where a candidate requires more than 36% marks in order to reach the minimum aggregate as many marks out of those actually secured by him will be taken into account as would enable him to make the deficiency in the requisite minimum aggregate.

4. The Thesis/Dissertation/Survey Report/Field Work shall be written & typed and submitted in triplicate so as to reach the office of the Registrar at least 3 weeks before the Commencement of the theory examination. Only such candidate shall be permitted to offer Dissertation/Field Work/Survey Report/Thesis (if provided in the scheme of examination) In lieu of a paper as have secured at least 55% marks in the aggregate of all scheme and I and II semester examination taken in the case of semester scheme, irrespective of the number of paper in which a candidate actually appeared at the examination.

5. The list of text books/ recommended books/ Reference Books as approved by the Various BoS, are printed along with the English Version only.

Digital Photogrammetry

Important points to be noted:

- The theory question paper will consist of Five Sections.
- Theory (External) – 80
- Internal Sessional Marks (Internal) – 20

  (Division of Sessional: Assignments – 10, 2 Terminal Test- 05, Attendance- 03, Co-curricular Activity- 02)

  (a) Every subject paper has five (5) units, and every unit covers two (2) marks.
  A sessional work is to be done on every unit - **(2X5= 10 marks)**

  (b) Two terminal Tests - **(2½X2 = 05 marks)**

  (c) Attendance of Theory/Practical Classes - **03 marks**
  (76%-84% - 01 mark)
  (85%-93% - 02 marks)
  (93%-100% - 03 marks)

  (d) Co-curricular Activities - **02 marks**
  Cultural & Literary (01 mark)
  Games & Sharmdaan (01 mark)

- Total Marks – 100
- Pass Marks – 36

- Please note that the Practical subject requires 40 % of marks to pass the examination separately

- Mandatory to pass the Internal and External (Written Exam) separately, Obtaining 36 Percent Marks.
- Duration of Examination: 3 Hours

INSTRUCTION FOR PRACTICAL EXAMINATION:

1. The record work should have 50 sheets (1/4th of 20"x30") and they should cover the total syllabus proportionately. The teacher should give fresh exercise every time so that the students may no undertake tracing of old exercises. The work must be done in the class room and signed on the same date. This would discourage completing the whole work at the nice of the examination. Emphasis should be laid on ink work.
2. Viva-voice examination be held to judge the real knowledge of the students and to examine the authenticity of the record work, the marking on record word and its viva-voce be based on the original work of the candidate and not merely producing the record work get done by any other agency. Marks to be deducted for the part of the syllabus not covered.
3. On an average about 20 students be examined in one day in Digital Photogrammetry. As far as possible one practical exercise, to set to judge the practical skill.

Note: A copy of the instructions to be sent to the examiners for their information.

Scheme of Examination of Digital Photogrammetry Examination

Paper No.	Nomenclature of the Paper	INTERNAL SESSIONAL	THEORY (WRITTEN EXAM)	Max. Marks
Unit I	Basic of Photogrammetry & Aerial camera	4	16	20
Unit II	Geometry of Aerial Photographs & Mathematics of Photogrammetry	4	16	20
Unit III	Techniques of photo and image Interpretation &	4	16	20
Unit IV	Stereo Photogrammetry & Digital photogrammetric work station	4	16	20
Unit V	Applications of Photogrammetric products	4	16	20
	Total	20	80	100

Process of Evaluation

- ✓ Theory Exams
- ✓ Practical's Exams
- ✓ Presentations
- ✓ Tree plantations (Geo-tagged)

There will be four theory papers and a practical in previous examination. Each of the theory papers will be of 80 marks. Each of the theory paper will be three hours duration. Candidates will be required to pass of both in theory and practical separately.

Digital Photogrammetry

Max. Marks – 100 **Min. Pass Marks – 36**

Internal Max. Marks – 20 **Min. Pass Marks – 07**

Theory Marks – 80 Marks **Min. Pass Marks – 29**

Unit 1

A. Basic of Photogrammetry-

A.1 Introduction and objectives of photogrammetry

A.2 Historical development of Photogrammetry, definition term and limitations,

A.3 Types of aerial photographs

A.4 Fundamental concept and basic information and specification of Aerial photography.

B. Aerial camera:

B. Introduction and objectives of Aerial camera

B.1Metric camera

B.2 Types of aerial camera (film camera, digital camera and active sensors),

B.3 Camera calibration for Aerial Photography,

B.4 Aerial film and types of aerial camera lenses and lens distortions,

B.5 Aerial project and mission planning, project definition and designing, GPS supported photography,

B.6 Camera selection, camera calibration, Film format and annotation.

Unit 2

A. Geometry of Aerial Photographs-

A. Introduction about Geometry of Aerial Photographs

A.1 Projection and properties, Central and orthogonal projection,

A.2 Concept of Tilt, Drift, crab, swing, Flight line, fiducially marks and fiducially axis, principal point, conjugative Principal point, Air base and ground base, and perspective center.

A.3 Overlapping on Aerial Photographs and their types,

A.4 Photogrammetric workflow.

A.5 Photogrammetric platforms.

B. Mathematics of Photogrammetry-

B.1Geodetic coordinate system, latitude and longitude

B.2 Two dimensional coordination system,

B.3 Datum: three dimensional transformations,

B.4 Map projection: two dimensional transformations.

B.5 Basic of image (single image, pair of image, image triplet).

B.6 Positional and rotational elements.

Unit 3

Techniques of photo and image Interpretation-

3.1 Introduction and objectives of interpretation

3.2 Basic Elements of Air Photo Interpretation of satellite image interpretation

3.3 Recognition elements: Tone, Color, Texture, Pattern, Shape, Size and associated features.

3.4 Photo and Map Scale,

3.5 Accuracy, error and precision.

3.6 International Accuracy slandered (NMAS)

Unit 4

A. Stereo Photogrammetry-

A.1 Introduction and objectives of Stereo Photogrammetry

A.1 Digital Photogrammetry

A.2Stereo scope vision Stereo model

A.3Modelformation, Orientation and their types (Interior and Exterior orientation)

A.5Aerial triangulation and its advantages, bundle block adjustment,

A.6 Image rectification

B. Digital photogrammetric work station: Introduction and objectives of Digital Photogrammetry

B.1 Digital Photogrammetry photogrammetric work station

B.2 Generating geospatial datasets, DEM and ortho-photo's generation.

B.3 Automated feature measurement for geospatial applications.

Unit 5

Applications of Photogrammetric products-

5.1 Concept of Mass points and Break lines

5.2 Contours and their types Volumetric Analysis.

5.3 Concept of DEM, DTM, TIN, GRID and DSM.

5.4 Aerial Photo mosaic, advantage and disadvantage of Photo mosaic.

5.5 Photogrammetric product and its application.

5.6 Ortho photo and their applications.

5.7 Applications of Photogrammetric products for mapping and planning

References:

1. American Society of Photogrammetry (1992), Manual of Remote Sensing, 2nd ed., Falls Publsiher, New York.
2. American Society of Photogrammetry, 1996 Multilingual Dictionary of Remote H.M., Wilson, Topographic Surveying.
3. John Wiley and Sons (1983) Sensing and Photogrammetry, New York.
4. VA Wolf, P.R. (1983), Elements of Photogrammetry, 2nd ed., McGraw-Hill, New York
5. Rampal KK. (1996), Handbook of Aerial photography and Interpretation. Concept Publishing Company, New Delhi

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