PANJAB UNIVERSITY, CHANDIGARH

(Estted. under the Panjab University Act VII of 1947- enacted by the Govt. of India)

FACULTY OF ARTS

SYLLABI

FOR

MASTERS IN GEOINFORMATICS

(SEMESTER SYSTEM) 1st & 2nd Semester

(w.e.f. 2019-20)

APPLICABILITY OF REGULATIONS FOR THE TIMEBEING IN FORCE

Notwithstanding the integrated nature of a course spread over more than one academic year, the regulations in force at the time a student joins a course shall hold good only for the examinations held during or at the end of the academic year. Nothing in these regulations shall be deemed to debar the University from amending the regulations subsequently and the amended regulations, if any, shall apply to all students whether old or new.

Outlines of Course Content and Syllabi
for the w.e.f. the session 2019-20

Masters in Geoinformatics is a multi-disciplinary & professional postgraduate course offered by Department of Geography, Panjab University Chandigarh from the academic session 2019-20. Department of Geography, Panjab University Chandigarh has been a pioneer in introducing such professional courses on geospatial technology. We first introduced a PG Diploma course in Remote Sensing and Geographic Information Systems in 2001 which was later upgraded into two year Masters in Remote Sensing and Geographic Information Systems (RS & GIS).Keeping pace with changing technological scenario in the field, the course was restructured and renamed as Masters in Geoinformatics which is now more robust in terms of course content and professional attitude as well as more flexible and interdisciplinary in nature. This two year course, divided into four semesters, is aimed at developing scientific, technical and professional attitude and skills among students.

Department of Geography, Panjab University offers a postgraduate Masters course that aims at developing technically skilled and scientificall

GUIDELINES FOR CONTINUOUS INTERNAL ASSESSMENT (20%)

1. **The Syndicate has approved the following guidelines, mode of testing and evaluation including Continuous Internal Assessment of Students:**
   i. **Terminal Evaluation : 80% (Theory 50% and Practical 30% as specified in syllabus)**
   ii. **Continuous Assessment : 20%**
   iii. **Continuous Assessment may include written assignment, snap tests, participation in discussions in the class, term papers, attendance etc.**
   iv. **In order to incorporate an element of Continuous Internal Assessment of students, the colleges/ Departments will conduct one written test as quantified below:**
      a) **Written Test : 25 (reduced to 5)**
      b) **Snap Test : 25 (reduced to 5)**
      c) **Term Paper : 25 (reduced to 5)**
      d) **Participation in class discussions : 15 (reduced to 3)**
      e) **Attendance : 10 (reduced to 2)**

      Total: 100 reduced to 20

2. **Weightage of 2 marks for attendance component out of 20 marks for Continuous Assessment shall be available only to those students who attend 75% and more of classroom lecture/ seminars/ workshops. The break-up of marks for** attendance component **for theory papers shall be as under:**

   (a) 75% and above upto 85% : 1
   (b) Above 85% : 2

3. **It shall** not be compulsory **to pass in Continuous Internal Assessment. Thus, whatever marks are secured by a student out of 20% marks, will be carried forward and added to his/her score out of 80%, i.e. the remaining marks allocated to the particular subject and, thus, he/she shall have to secure pass marks both in the University examinations as well as total of Internal Continuous Assessment and University examination.**

4. **Continuous Internal Assessment awards fr [& DITAKK(QF& DITEBBKFBz&D T j KkQT&DDIkT(QFQK(QF**

Masters in Geoinformatics COURSE OUTLINE			
Course Code	Course Title	Max. Marks	Credits
SEMESTER-I			
GI 101	**Fundamentals of Remote Sensing**	**100**	**4**
GI 102	**Fundamentals of Photogrammetry**	**100**	**4**
GI 103	**Fundamentals of Geographic Information Systems**	**100**	**4**
GI 104	**Fundaments of Computer and Computer Programming**	**100**	**4**
SEMESTER-II			
GI 201	**Cartography**	**100**	**4**
GI 202	**Spatial Analysis**	**100**	**4**

SEMESTER-I

11.

Unit-II

v. Basic Geometry of Aerial Photographs
vi. Calculation of Photo Scale
vii. Relief Displacement: Concept and Calculations
viii. Parallax: Concept and Determination
ix. Calculation of Height of Objects on Vertical Aerial Photograph

Unit-III

x. Stereoscopy: Definition
xi. Principles of vision, Binocular Vision, Stereoscopic Vision Testing,Pseudoscopic Views
xii. Types of Stereoscopes and their Operations

Unit-IV

xiii. Planimetric Positions
xiv.

4. Paul Wolf et al., *E nts of oto ra tr w t App at on n GI* , Fourth Edition,McGraw-Hill Professional, 2013.
5. Srivastava, G.S., *An Intro u t on to G o nfor at s*, McGraw Hill Education, India, New Delhi, 2014
6. Wolf, P. R., *E nts of oto ra tr* . McGraw-Hill, NY, 1983.
7. Zorn, H. C., *Intro u tor Cours n oto ra tr* . 6th Ed. ITC, Netherlands, 1980.

Further Reading:

1. Burnside, C. D., *app n fro A r a oto rap* 2nd Ed, Collins, 1985.
2. Campbell, J.B., *Intro u t on to ot ns n* , 3rd ed., The Guilford Press, 2002.
3. Curran Paul, J., *r n p s of ot ns n* , UK: ELBS, 1984.
4. Gomarasca, Mario A, *Bas s of G o at s*, Springer, Heidelberg, 2009.
5. Joseph, George, *Fun a nta s of ot ns n* Universities Press India, 2007.
- Lillesand, T. M.; R.W. Kiefer, and J.W. Chipman, *ot ns n an I a Int rpr tat on*, 5th Edition, Wiley, 2007.
7. Sabins, Floyd F., *ot ns n r n p s an Int rpr tat on* New York: WHFreeman and Company, 2007.

Pedagogy: Students will be demonstrated the difference between qualitative andquantitative understanding of various aspects of Photogrammetry. Demo exercise onmeasurements on the map and photo will make students aware the importance ofPhotogrammetry in objective and precise mapping using aerial photographs.

GI 103: FUNDAMENTALS OF GEOGRAPHIC INFORMATION SYSTEMS

Max. Marks : 100
Theory : 50
Practical : 30
Internal Assessment : 20

Objectives: The main objective of this course is to expose the students to fundamental principles of Geographical Information Systems including basic concepts and definitions, methods and techniques. It also introduces basics of GIS software and tools.

(A) THEORY **Marks: 50**

Unit- I

Concepts and Definitions

i. Geographic Information Systems (GIS): Definition and Developments
ii. Spatial data base: Points, Lines and Polygons
iii. GIS Components: Hardware and Software

Unit-II

Functional Elements

iv. Data Acquisition, Input and Editing
v. Data Manipulation and Topology Creation
vi. Data Analysis and Query

Unit-III

Data Management and Structure

vii. Data Base Management System (DBMS): Purpose and structure
viii. Classification: Raster, Vector, Quadtree, Hierarchical, Network and Relational

Unit-IV

GIS Applications

ix. GIS Applications
x. GIS: Decision Support System

Note:

1.

3. Brewer, C.A.,*D s n n B tt r aps A Gu for GI s rs*

SEMESTER-II

GI 201: CARTOGRAPHY

Max. Marks : 100
Theory : 50
Practical : 30

LIST OF READINGS

Essential Readings

1. Cromley, R.G., *Digital Cartography*, Prentice-Hall of India, New Delhi, 1992.
2. Crampton, W.C., *Applied Cartography: An Introduction to Cartography and GIS* John Wiley & Sons, New York, 2010.
3. Dent, B.D., *Cartography: Thematic Map Design*, WBC McGraw–Hill, Boston, 1999.
4. John Krygier and Denis Wood, *Making Maps: A visual guide to map design for GIS*

(B) PRACTICAL **Marks: 30**

1. Familiarization with Image Processing Software
2.

GI 204: FUNDAMENTALS OF GLOBAL POSITIONING SYSTEM

Max. Marks : 100
Theory : 50
Practical : 30
Internal Assessment : 20

Objectives: The objectives of this paper are to give a comprehensive introduction to GPS and DGPS technology, system concepts, design, operation, implementation and applications, to provide detailed information on the GPS signal, the processing by the receiver, and the techniques by which GPS obtains position, velocity and time.

(A) THEORY **Marks: 50**

Unit-I

i.