**Sant Gadge Baba Amravati
University, Amravati
FACULTY : Science**
Scheme of Teaching, Learning, Examination & Evaluation leading to Two Years PG Degree Master of Science (Geoinformatics) following Three Years UG Programme wef 2023-24
(Two Years- Four Semesters Master's Degree Programme- NEPv23 with Exit and Entry Option
M.Sc. I First Year Semester- I

S.N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme								
				Teaching Period Per Week				Credits				Maximum Marks				Total Marks	Minimum Passing		
												Theory		Practical					
				L	T	P	Total	L/T	Practical	Total		Theory Internal	Theory +MCQ External	Internal	External		Marks Internal	Marks External	Grade
0	*Pre-Requisite Course(s) if applicable/MOOC/Internship/FieldWork cumulatively If students wish to opt Minor Course ofUG as Major for PG, **balance 12 Credits** Course will have to be completed **(As and when applicable)**	Th-Prq		0	0	0	0	Additional Credits to be earned = (1) minus (2) (1). Credits from Major DSC Courses in UG (minus) (2).The Credits already earned from the Course as Minor at UG, now to be opted as Major at PG			35			50	06	14	P	0	*Pre-Requisite Course(s) if applicable/MOOC/Internship/ FieldWork cumulativelyIf students wish to opt Minor Course ofUG as Major for PG, **balance 12 Credits** Course will have to be completed (As and when applicable)
1	Research Methodology and IPR	Th-Major	1 GNF 1C	4			4	4		4	3	40	60			100	16	24	P
2	DSC I.1 Principles of Remote Sensing	Th-Major	1 GNF 2C	4			4	4		4	3	40	60			100	16	24	P

#	Course	Type	Course Code	L	T	P			Credits		CIE	SEE			Total	Min. Passing Marks		Grade
3	DSC II.1 Introduction to GIS	Th-Major	1 GNF 3C	4			4	4		4	3	40	60			100	16	24	P
4	DSC III.1 Photogrammetry	Th-Major	1 GNF 4C	3			3	3		3	3	40	60			100	16	24	P
5	DSE I 1. Geodesy and GPS-I **OR** 2. Introduction to IT and Data Science –I **OR** 3. MOOC	Th-Major Elective	1 GNF 5A OR 1 GNF 5B	3			3	3		3	3	40	60			100	16	24	P
																Minimum Passing Marks		**Grade**
6	Lab-I (Remote Sensing Lab)	Pr-Major	1 GNF 6C			4	4		2	2	3			50	50	100	50		P
7	Lab –II (GIS Lab)	Pr-Major	1 GNF 7C			4	4		2	2	3			50	50	100	50		P
8	# On Job Training, Internship/ Apprenticeship; Field projects/tour report **Related to Major @ during vacations cumulatively**	Related to DSC		**120 Hours cumulatively during vacations of Semester I and Semester II**					4*		2								P*
9	**Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts During Semester I, II, III and IV**	Generic Optional		**90 Hours Cumulatively From Sem I to Sem IV**															
	TOTAL								22						700			

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Pracstical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT:** On Job Training: Internship/ Apprenticeship; Field projects: **FP**; **RM:** Research

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M.Sc. I First Year Semester- II

S.N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme				Total Marks	Minimum Passing		
				Teaching Period Per Week				Credits				Maximum Marks							
												Theory		Practical					
				L	T	P	Total	L/T	Practical	Total		Theory Internal	Theory +MCQ External	Internal	External		Marks Internal	Marks External	Grade
1	DSC- I (Fundamentals of Cartography)	Th-Major	2 GNF 1C	4			4	4		4	3	40	60			100	16	24	P
2	DSC-II (Digital Image Processing)	Th-Major	2 GNF 2C	4			4	4		4	3	40	60			100	16	24	P
3	DSC-III (Spatial Modeling & Analysis)	Th-Major	2 GNF 3C	4			4	4		3	3	40	60			100	16	24	P
4	DSE I 1. Geostatistics OR 2. Fundamentals of Geomorphology OR 3. MOOC	Th-Major	2 GNF 4A OR 2 GNF 4B MOOC	3			3	3		3	3	40	60			100	16	24	P
																	Minimum Passing Marks		Grade
5	Lab-I- Digital Image Processing Lab	Pr-Major	2 GNF 5C			4	4	4		2	2	3			50	50	100	50		P
6	Lab-II -Spatial Modeling & Analysis Lab/MOOC	Pr-Major	2 GNF 6C			4	4	4		2	2	3			50	50	100	50		P
7	# On Job Training, Internship/ Apprenticeship; Field	Related to DSC		120 Hours cumulatively during vacations of						4*									P*

				L	T	P											
	projects/tour report **Related to Major @** **during** **vacations cumulatively**			**Semester I and Semester II**													
8	**Co-curricular Courses:** **Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performi ng Arts** **During Semester I, II, III and IV**	Generic **Optional**		**90 Hours Cumul atively From Sem I to Sem IV**													
	TOTAL						**18+4***							**600**			

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Pracstical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT:** On Job Training: Internship/ Apprenticeship; Field projects: **FP**; **RM:** Research

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M.Sc. I First Year Semester- III

S.N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme							
				Teaching Period Per Week				Credits				Maximum Marks				Total Marks	Minimum Passing		
												Theory		Practical					
				L	T	P	Total	L/T	Practical	Total		Theory Internal	Theory +MCQ External	Internal	External		Marks Internal	Marks External	Grade
1	DSC- I.3 (GIS Development and Open Source GIS)	Th-Major	3 GNF 1C	4			4	4		4	3	40	60			100	16	24	P
2	DSC- II.3 (Geoinformatics Applications in Natural Resources Management)	Th-Major	3 GNF 2C	4			4	4		4	3	40	60			100	16	24	P
3	DSC- III.3 (Geoinformatics Applications in Agriculture)	Th-Major	3 GNF 3C	4			4	4		3	3	40	60			100	16	24	P
4	DSE- I.3A (Application of GIS for Disaster Management) **OR** DSE- I.3B (Surveying and Data Processing) **OR** MOOC	Th-Major	3 GNF 4A **OR** 3 GNF 4B	3			3	3		3	3	40	60			100	16	24	P
																	Minimum Passing Marks		Grade
5	Lab-I- Open sources GIS	Pr-Major	3 GNF 5C			4	4	4	2	2	3			50	50	100	50		P

	Lab																	
6	Lab-II- GIS Applications in Natural Resources and Agriculture Lab	**Pr-Major**	3 GNF 6C		4	4		2	2	3			50	50	100	50		P
7	**Research Project Phase-I**	**Major**		2	4	6	2	2	4			50	--	50	25		P
8	**Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts During Semester I, II, III and IV**	Generic **Optional**		**90 Hours Cumulatively From Sem I to Sem IV**														
	TOTAL									**22**					650			

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Pracstical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT:** On Job Training: Internship/ Apprenticeship; Field projects: **FP**; **RM:** Research

FACULTY : Science

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M.Sc. I First Year Semester- IV

S.N.	Subject	Type of Course	Subject Code	Teaching & Learning Scheme							Duration Of Exam Hours	Examination & Evaluation Scheme					Minimum Passing		
				Teaching Period Per Week				Credits				Maximum Marks				Total Marks			
												Theory		Practical					
				L	T	P	Total	L/T	Practical	Total		Theory Internal	Theory +MCQ External	Internal	External		Marks Internal	Marks External	Grade
1	DSC –I .4 (DBMS and Advances in Geospatial Technologies)	Th-Major	4 GNF 1C	4			4	4		4	3	40	60			100	16	24	P
2	DSC –II .4 (Web Mapping and Web GIS)	Th-Major	4 GNF 2C	4			4	4		4	3	40	60			100	16	24	P
3	DSC –III .4 (GIS for Urban Planning and Infrastructure Development)	Th-Major	4 GNF 3C	4			4	4		3	3	40	60			100	16	24	P
4	DSE –IV .4A (Geoinformatics Applications in Water Resources Management) **OR** DSE –IV 4B (GIS for Coastal Management) **OR** MOOC	Th-Major	4 GNF 4A **OR** 4 GNF 4B	3			3	3		3	3	40	60			100	16	24	P
																	Minimum Passing Marks		Grade
5	Lab-I- Advanced Geospatial data	Pr-Major	4 GNF 5C			4	4		2	2	3			50	50	100		50	P

#	Course	Type	Code		L	T	P	Credits							Int	Ext	Total				
	Processing GIS Lab																				
6	Lab-II- Urban Development and Water Resources Management-Lab	Pr-Major	4 GNF 6C			4	4		2	2	3				50	50	100		50		P
7	Research Project Phase-II	Major	4 GNF 7C		2	8	10	2	4	6	3				75	75	150		75		P
8	**Co-curricular Courses:** **Health andwellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/ Performing Arts During Semester I, II, III and IV**	Generic **Optional**		**90 Hours Cumulatively From Sem I to Sem IV**																	
	TOTAL							24									750				

L: Lecture, T: Tutorial, P: Practical/Practicum

Pre-requisite Course mandatory if applicable: **Prq**, Theory : **Th**, Practical/Practicum: **Pr**, Faculty Specific Core: **FSC**, Discipline Specific Core: **DSC**, Discipline Specific Elective: **DSE**, Laboratory: **Lab**, **OJT:** On Job Training: Internship/ Apprenticeship; Field projects: **FP**; **RM:** Research

Table: Comprehensive Credits distribution amongst the type of Courses over Two Years (Four Semesters) PG Programme and Minimum Credits to be earned for PG Degree [Master in Faculty Science and Technology; Major – Geoinformatics]

Sr. No.	Type of Course		Total Credits Offered	Minimum Credits Required
1	**MAJOR**			
	i. DSC	56		56
	ii. DSE	16		16
	TOTAL		72	72
2	**Research Methodology and IPR (FSC/DSC: Major)**	04	04	04
2	On Job Training, Internship/ Apprenticeship; Field projects **Related to Major**	04	**04 for 120 Hours OJT/FP cum.**	**02 (Minimum 60 Hours OJT/FP is mandatory)**
3	**Research Project**	10	10	10
	OPTIONAL			
4	**Co-Curricular Courses (offline and/or online as applicable):** Co-curricular Courses: Health and wellness, Yoga Education, Sports and Fitness, Cultural Activities, NSS/NCC, Fine/Applied/Visual/Performing Arts, CC also include but not limited to Academic activities like paper presentations in conferences, Aavishkar, start-ups, Hackathon, Quiz competitions, Articlepublished, Participation in Summer school/ Winter School / Shortterm course, Scientific Surveys, Societal Surveys, Field Visits, Study tours, Industrial Visits, online/offline Courses on Yoga (Yoga for IQ development, Yoga for Ego development, Yoga for Anger Management, Yoga for Eyesight Improvement, Yoga for Physical Stamina, Yoga for Stress Management, etc.).		**Limited to Maximum 03 only** **(For 90 Hours of CC cumulatively)**	**00**
	TOTAL			
	TOTAL		93	88

Table A: Comprehensive Credit Distribution for CC

Sr. N.	Activities (offline/online as applicable)	Credits at Levels						Letter Grade
		College	University	State	Zone if exist	National	International if exist	
1	Health and wellness, Yoga* Competitions *If a Course (online/offline) on Yoga is completed for 60 Hours, 2 credits will be awarded to the student (1 Credit = 30 Hours)	1	2	3	4	5	6	P (Pass)
2	Unnat Bharat Abhiyan[UBA]	1	2	3	4	5	6	P (Pass)
3	Sports and fitness activities (see separate **Table B**)	1	1 / 2	2 / 3	3 / 4	4 / 5	5 / 6	P (Pass)
4	Cultural activities, Fine/Applied/Visual/Performing Arts	1	2	3	4	5	6	P (Pass)
5	N.S.S. activities Camps	1	2	3	4	5	6	P (Pass)
6	Academic activities like Research Paper/Article/Poster presentations, Aavishkar, start-up, Hackathon, Quiz competitions, other curricular, co-curricular activities, student exchange program etc.	1	2	3	4	5	6	P (Pass)
	Research Paper/Article published	--	1	2	-	4	6	P (Pass)
7	Participation in Summer school/ Winter School / Short term course	2 Credits						P (Pass)
		4 Credits						P (Pass)
	(not less than 30 hours 1 or 2 weeks duration) (not less than 60 hours 2 or 3 weeks duration)	2 Credits						P (Pass)
	Scientific Surveys, Societal Surveys							
	Field Visits, Study tours, Industrial Visits,	1 Credit						P (Pass)
8	NCC Activities	As given in **Table C**						

Table B: Credit Distribution for Sports and Fitness

Sr. No.	Particulars of Sports Status (Individual/ Team)	Credits	Letter Grade
1	College Level Participation	1	P (Pass)
2	University Level Participation	1	P (Pass)
3	University Level Rank 1, 2, 3	2	P (Pass)
4	State Level Participation	2	P (Pass)
5	State Level Rank 1, 2, 3	3	P (Pass)
6	Zonal Level Participation	3	P (Pass)
7	Zonal Level Rank 1, 2, 3	4	P (Pass)
8	National Level Participation	4	P (Pass)
9	National Level Rank 1, 2, 3	5	P (Pass)
10	International Level Participation	5	P (Pass)
11	International Level 1,2,3	6	P (Pass)

Table C: Credit Distribution for NCC activities

Sr. No.	Particulars of NCC Activities	Credits	Letter Grade
1	Participation in NCC activities	1	P (Pass)
2	'B' Certificate obtained	2	P (Pass)
3	'C' Certificate obtained	3	P (Pass)
4	State Level Participation	4	P (Pass)
5	National level Participation	5	P (Pass)
6	International Level Participation	6	P (Pass)

Sant Gadge Baba Amravati University, Amravati
Additional Instructions to the Paper Setters
M.Sc. Geoinformatics as per Scheme under NEP 2020

The duration of University theory examination shall be of Three hours or appropriate hours as prescribed in the syllabus/curriculum of the pertinent course

The Maximum Marks for the Question Paper shall be 60

The Question Paper shall consist of Short Answer type (60%) and Long Answer type (40%) questions.

Examiner shall set Long answer type Questions and Short Answer type Questions as specified in the following Table or as applicable as per the curriculum.

There shall be internal choice for Short-Answer type Question as well as Long Answer type Question for every Unit.

The Question paper should be set based on the Course Outcomes (COs) defined in the curriculum and setter shall ensure that all the outcomes are addressed through appropriate questions.

Read and study the Course Outcomes of a paper/subject/course very carefully.

The Questions should help to measure attainment of their corresponding Course Outcomes as prescribed in the syllabus/curriculum. All questions must be mapped to their related Course Outcomes.

Questions paper should try to address the different levels of learning (Bloom's Taxonomy)

i.e. Knowledge/Remembering, Understanding, Applying, Analyzing, Evaluating and Creating

All Units mentioned in the course should be covered with equal weightage. The question paper shall be set so as to cover the entire syllabus of the respective course (paper).

The degree of difficulty of the question paper should be such that a student, who has engaged himself in the continuous learning process should be able to clear with ease. However, for scoring further his all-round knowledge and skills should be tested.

Model Solutions/answers to the short answer type questions and long answer type questions and scheme of marking for all question shall be submitted along with the question paper in a separate envelope.

Please ensure that the total marks for a course/subject/paper amounts to the prescribed total as notified in the scheme/curriculum. The total number of marks available for each question and each part of a question should be shown in the mark scheme and must tally with the marks shown on the question paper.

Avoid Questions like "Write short notes on …"

The question paper should be precise and should be designed such that the questions:

- are unambiguous

- are asked for appropriate marks

- The questions should be serially numbered as 01, 02, 03, 04, 05, 06 etc.

- Sub-questions, if any, shall be numbered as A,B,C,D,… continuously for all Units

- It must be ensured that all questions are from within the prescribed syllabus

The paper setters should specify whether any Charts, Graphs, Tables, Codes, Books etc. are to be provided to the students. The use of which shall be permitted during the actual conduct of the examination.

For Short-Answer type Questions, ensure that:

- the item calls for a single, brief answer

- the item has been written as a direct question

- the desired response is related to the main point of the item

- clues to the answer have been avoided (e.g. "a" or "an", length of the blank)

- the units and degree of precision is indicated for numerical answers.

For Long Answer type questions, make sure that:

questions starting questions with "who", "what", "when", "where", "name", "list" are avoided as these terms limit the response.

questions must follow Bloom's taxonomy with inclusion of following levels:

Table 1: Sample Terms for inclusion in Questions

Outcome	Sample Terms
Comparing	Compare,classify,describe,distinguishbetween,explain,outline,summarize, etc.
Interpreting	Convert,draw,estimate,illustrate,interpret,restate,summarize,translate, etc.
Inferring	Derive, draw, estimate, extend, extrapolate, predict, propose, relate, etc.
Applying	Arrange,compute,describe,demonstrate,illustrate,rearrange,relate, summarize, etc.
Analyzing	Breakdown,describe,diagram,differentiate,divide,list,outline,separate, etc.
Creating	Compose, design, devise, draw, formulate, makeup, present, propose, etc.
Synthesizing	Arrange, combine, construct, design, rearrange, regroup, relate, write, etc.
Generalizing	Construct, develop, explain, formulate, generate, make, propose, state, etc.
Evaluating	Appraise, criticize, defend, describe, evaluate, explain, judge, write, etc.

Table 2. Distribution of Marks amongst Question paper

Total marks of Theory Paper	Marks for Long + Short Answer	Distribution of Unit wise Long/Short Answer type Questions
60	60	Long Answer: Two Questions 5 Marks (Two Questions) or 10 Marks (One Question) Short Answer: Four Questions 3 + 3 + 4 Marks

Note: For a unit, an identical pattern of long and short answer shall be adhered for internal choice, that is 'either-or' questions shall be in same pattern.

Table 3: Model Question Paper Pattern

Sr. No of Questions	Questions	Marks allotted to each Question
	M.Sc. I (Geoinformatics) Semester-I Examination NEP - 2020 Paper Title As per Curriculum Time: Three Hours Total marks: 60 N.B.: (1) All questions are compulsory Draw well labelled diagrams whenever necessary. Students may use various colors to signify answers.	
Q. No.	Explain in Brief (Short Type)	
A.		3
B.		3
C.		4
	OR	
D.		3
E.		3
F.		4
Q. No.	Explain in detail (Long type question)	
G.		10
	OR	
H.		10
Q. No.	Explain in detail (Long type question)	
I.		5
J.		5
	OR	
K.		5
L.		5

Note:

Paper Setter Shall set 4 Short Type and Two Long Type (either 10 Marks for One Question or 5 Marks each for Two Questions)

The Units from the Curriculum for Short and Long Type of Questions shall not be same for all the sets. Paper Setter shall decide it variably from the Units under the curriculum.
Avoid / Minimize the questions-based Fist level of learning as per Blooms Taxonomy like – Define, State, Quote, List the steps, Identify, Who Discovered, Name the parts of, Recite the rules for, etc.
Strictly Avoid –

Once the Question Type is decided and prefixed as Explain / Describe / Distinguish / in details then while setting sub questions under the same should not repeat the usage of the same For Ex.

Q1: Describe in Details:
Sub question 1A: Describe Elements of EMS Sub question 1B: Explain remote sensing platform .
Sub question 1B: Distinguish between airborne and spaceborne platform.

Instead, it should be:

Q1: Describe in Details:

Sub question 1A: Elements of EMS   Sub question 1B: Remote sensing platform
Sub question 1B: Features of airborne and spaceborne platform.

Consistency shall be maintained in sub-questions as A, B, C, D,   Z

On exhaustion of the alphabets use AA, AB, AC, AD …. AZ in continuation for the further questions.