Academic Council

Item No:_____

Devrukh Shikshan Prasarak Mandal's

NYA. TATYASAHEB ATHALYE ARTS, VED. S.R. SAPRE COMMERCE &

VID. DADASAHEB PITRE SCIENCE COLLEGE, DEVRUKH

[AN AUTONOMOUS COLLEGE UNDER UNIVERSITY OF MUMBAI]

Syllabus for First Year Bachelor of Vocation

Program: Bachelor of Vocation Programme in Geoinformatics for Village Resource Mapping

Semester I and II

The component as per NSQF: Skill and General Component

Credit Based Semester and Grading System with the Effect from

w.e.f. Academic Year 2020-2021

BACHELOR OF VOCATION
Geoinformatics for Village Resource Mapping:
(to be implemented from 2020-21)
Semester-I

Code	**Paper**	**Credits**	**H/Wk**	Total Hours
Skill Component				
BGVRMS11	Land Surveying Techniques	4	8	120
BGVRMS12	Introduction to AutoCAD	4	8	120
BGVRMS13	Spatial Analysis - QGIS	4	8	120
BGVRMS14	Computer Fundamentals for Office Automation	4	8	120
BGVRMS15	Yoga/ NCC/NSS/DLLE	2	4	60
	Total	18	36	540
General Component				
BGVRMG -11	Traditional and GNSS Surveying (Handheld and Smartphone-Based)	3	3	45
BGVRMG -12	Introduction to Cartography and AutoCAD	3	3	45
BGVRMG -13	Introduction to GIS with a focus on QGIS	3	3	45
BGVRMG -14	Computer Fundamentals for Office Automation	3	3	45
	Total	12	12	180

Semester-II

Code	**Paper**	**Credits**	**H/Wk**	Total Hours
Skill Component				
BGVRMS21	GNSS and Total Station Surveying	4	8	120
BGVRMS22	Advanced Spatial Analysis - ArcGIS	4	8	120
BGVRMS23	Web GIS	4	8	120
BGVRMS24	Communication Skills	4	8	120
BGVRMS25	Life Skills	2	4	60
	Total	18	36	540
General Component				
BGVRMG -21	GNSS and Total Station Surveying	3	3	45
BGVRMG -22	GIS Analysis	3	3	45
BGVRMG -23	Web GIS	4	4	60
BGVRMG -24	Communication Skills	3	3	45
	Total	3	3	45

Course Code details:
BGVRM- B. Voc. in Geoinformatics for Village Resource Mapping
S:- Skill Component
G:- General Component

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper I:

Land Surveying Techniques

Course Code: BGVRMS11 **Credits: 4** **Hours: 120**

Objective:

- To provide practical experiments required for land survey mapping.

1. Chain Triangulation Survey
2. Cross Staff Survey
3. Chain and Tape-Open Traverse Survey
4. Chain and Tape-Close Traverse Survey
5. Plane Table Survey-Radial Method
6. Plane Table Survey-Intersection Method
7. Plane Table Survey-Open Traverse Method
8. Plane Table Survey-Close Traverse Method
9. Prismatic Compass Survey-Intersection Survey
10. Prismatic Compass Survey-Open Traverse Survey
11. Prismatic Compass Survey-Close Traverse Survey
12. Clinometer Survey
13. Dumpy Level Survey
14. Theodolite Survey

References:

1. Gopal Singh (2009): Map Work and Practical Geography, Vikas Publishers House, New Delhi
2. Ashish Sarkar (2011): Practical Geography - A Systematic Approach, Orient Blackswan, Private Limited, Hyderabad.
3. डॉ. अर्जुन कुंभार, (१९९३): प्रात्यक्षिक भूगोल, सुमेरू प्रकाशन, डोंबिवली, महाराष्ट्र.
4. Anderson J. M. and E. M. Mikkhail (1985): Introduction to Surveying, McGraw Hill Book Co. NY
5. R. Ben Buckner (2001): Land Survey Review Manual (Hardcover), Amazon Books.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the changing scenario of land surveying methods and techniques. After the course, the learner will know the chain, plane table, prismatic compass, clinometer, dumpy level, and theodolite survey techniques.

Skills

The learner can plan and carry out a land survey using the techniques taught.

General competence

The learner can start a consultancy and surveying service for any type of land parcel mapping. Also, learners can perform all the duties that are carried by the land record department of the government.

Required Previous Knowledge

Knowledge of the fundamentals of map scales and map projections is necessary before starting to learn the course. The same will be provided through the General Component paper of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper II: Introduction to AutoCAD

Course Code: BGVRMS12 **Credits: 4** **Hours: 120**

Objective:

- To inculcate skills of mapping land parcels surveyed through various traditional techniques.

1. Getting Started with AutoCAD Map
2. Understanding Data Formats
3. Data Interoperability
4. Coordinate Geometry
5. Layer Management
6. Digitization using Commands
7. Data Cleaning
8. Drafting
9. Work with COGO tools to accurately map objects
10. Insert rectified raster images
11. Work with a variety of attribute data
12. Apply object classification to your mapping system
13. Import GIS data from a variety of sources
14. Export geometry and attribute data to other GIS formats
15. Connect directly to GIS data and stylize features
16. Access Data using the Autodesk Connector for ArcGIS
17. Connect to raster surface data and raster images
18. Attach and query source drawings
19. Save changes to attached source drawings
20. Extract data for reports and quantity takeoffs
21. Create, manage and analyze topologies
22. Create dynamic scale bars, north arrows, and legends
23. Produce map books to automate sheet layout

References:

1. AutoCAD Map Manual

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the functioning of the AutoCAD Map, data formats, data interoperability, coordinate Geometry, Layer Management, digitization, data cleaning, and drafting processes.

Skills

The learner can prepare, digitize, and edit a map using AutoCAD map.

General competence

The learner can start a layout mapping service also, he/she can prepare layout maps for buildings to be used for any official records.

Required Previous Knowledge

Knowledge of the fundamentals of map scales and map projections is necessary before starting to learn the course. The same will be provided through the General Component paper of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper III: Spatial Analysis – QGIS

Course Code: BGVRMS13 **Credits: 4** **Hours: 120**

Objective:

- To instill skills for GIS-based mapping of land parcels surveyed through various modern techniques.
- To skill the learner for digital mapping of spatial and non-spatial data.

1. Q-GIS Interface
2. Georeferencing Topo Sheets and Scanned Maps
3. Georeferencing Aerial Imagery
4. Digitizing Map Data
5. Searching and Downloading OpenStreetMap Data
6. Basic Raster Styling and Analysis
7. Raster Mosaicing and Clipping
8. Working with Terrain Data
9. Working with WMS Data
10. Working with Projections
11. Making a Map
12. Working with Attributes
13. Importing Spreadsheets or CSV files
14. Basic Vector Styling
15. Calculating Line Lengths and Statistics
16. Collection of Spatial and Non-Spatial Data for GIS Module.
17. Creation of Shapefile, Point, Line, Polygon (Area); Topology creation and error correction.
18. Attribute data creation and table joins. Spatial and Attribute Queries.
19. Preparation of Thematic Map and layout.

References:

1. Q-GIS Manuals

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the processes of georeferencing. layer creation, linking of spatial and non-spatial data, uses & availability of analysis tools in Q-GIS, and management of the spatial and non-spatial data in Q-GIS.

Skills

The learner can georeference, digitize, edit, and analyze a map using Q-GIS.

General competence

The learner can start a layout mapping service also, he/she can prepare layout maps for buildings to be used for any official records.

Required Previous Knowledge

Knowledge of the fundamentals of map scales and map projections is necessary before starting to learn the course. The same will be provided through the General Component paper of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper IV: Computer Fundamentals for Office Automation

Course Code: BGVRMS14 **Credits: 4** **Hours: 120**

Objective:

- To inculcate basic computer skills for office automation.

1. Create a new document, save, open, and print the document in MS Word.
2. Editing and formatting of a Word document.
3. Insert elements to a word document *viz*. Insert and delete page break, Insert page numbers, Insert symbols, Insert Shapes, Clip art, Insert picture, resize and reposition a picture),
4. Change Layout of a word document *viz*. adjust page margin and page size, Change page orientation, Set and change indention, Insert and clear tabs.
5. Inserting and formatting of a table in a word document *viz*. Insert a table, Navigate and select text in a table, Resize parts of a table, Align text in a table, Format a table, Insert and delete columns and rows, Borders and shading, Merge table cells),
6. Use of Spelling and grammar check and autocorrect options in MS word.
7. Create a spreadsheet and format rows and columns viz. selecting row, column, cell, Inserting and deleting a row, column, and cell, hide and unhide row & column, changing height and width of row and column.
8. Use of formula bar for various applications
9. Calculative Examples of spreadsheet-like salary sheet, mark sheet, sorting, and filtering of data.
10. Create different types of charts and editing of charts in a spreadsheet.
11. Create a new Powerpoint presentation - Inserting new slide, different layout of slide, inserting date, slide number, movie, sound, object, header, and footer,
12. Designing of slides in PowerPoint - Theme, and background, Custom animation, Slide transition, Rehearse timings,
13. Use of Slide show, setup slide show, hide a slide, different views of a slide, use of slide master, printing hand out in PowerPoint.
14. Use of the Internet – different web browsers, search engines.
15. Use of Email, Blogs and Forums, Social media, and chatting.
16. Bookmarking, Internet Search, Basic and advanced search.
17. Downloading and uploading of the documents.

Reference Books

1. Windows-98 6 in 1 Practice Hall Publications.
2. ABC of Word 97 by BPB Publication.
3. ABC of Excel by BPB Publication.
4. Computer Fundamentals P.K. Sinha by BPB Publication.
5. Internet-An Introduction, TATA McGraw Hill Publication.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of Word, Excel, and PowerPoint.

Skills

The learner can use Word, Excel, and PowerPoint very effectively. It will be helpful for the project report writing and its management.

General competence

The learner can start his business as a service provider regarding Word, Excel, and PowerPoint.

Required Previous Knowledge

No previous knowledge is required.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping, Banking and Financial Services, and Sustainable Agriculture. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper V: Life Skills

Course Code: BGVRMS15 **Credits: 2** **Hours: 6**

Under this course, the student can have a choice to opt for the course from the following.

- Yoga
- NSS
- NCC
- Fine Art
- Basic Mathematics, etc.

The syllabus for the course is given under the course list of Sustainable Agriculture

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of life Skills.

Skills

The learner can have the skills required to live a happy and healthy life.

General competence

The learner can manage time and stress very effectively.

Required Previous Knowledge

No previous knowledge is required.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping, Banking and Financial Services, and Sustainable Agriculture. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

General Component Paper I:

Traditional Land Surveying Techniques

Course Code: BGVRMG 11 **Credits: 3** **Hours: 45**

Objectives:

- To provide the theoretical background required for land survey mapping.

Module 1: Introduction to Surveying

- Concept and History of Surveying
- Types of Surveying
- Applications of Surveying
- Need for surveying

Module 2: Chain Survey

- Chain Triangulation Survey
- Cross Staff Survey
- Chain and Tape-Open Traverse Survey
- Chain and Tape-Close Traverse Survey

Module 3: Plain Table Survey

- Radial Method
- Intersection Method
- Open Traverse Method
- Close Traverse Method

Module 4: Other Important Surveying Methods:

- Prismatic Compass Survey
- Clinometer Survey
- Dumpy Level Survey
- Theodolite Survey

References:

1. Gopal Singh (2009): Map Work and Practical Geography, Vikas Publishers House, New Delhi
2. Ashish Sarkar (2011): Practical Geography - A Systematic Approach, Orient Blackswan, Private Limited, Hyderabad.
3. डॉ. अर्जुन कुंभार, (१९९३): प्रात्यक्षिक भूगोल, सुमेरू प्रकाशन, डोंबिवली, महाराष्ट्र.
4. Anderson J. M. and E. M. Mikkhail (1985): Introduction to Surveying, McGraw Hill Book Co. NY
5. R. Ben Buckner (2001): Land Survey Review Manual (Hardcover), Amazon Books.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of surveying.

Skills

The learner can have skills of surveying and the same can be applied during the skill component.

General competence

The learner can have conceptual clarification before starting surveying. It will result in quality work related to land surveying and subsequent mapping.

Required Previous Knowledge

Any previous knowledge is not necessary to learn the course.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

General Component Paper I: Introduction to Cartography and AutoCAD

Course Code: BGVRMG12 **Credits: 3** **Lectures: 45**

Objective:

- To provide fundamentals of cartography and AutoCAD.

Module I:

- Cartography: Nature, scope, elements, history, development, and applications;
- Map scales: numerical, verbal, graphical scale, and representative fraction;
- Conversion of Map Scales
- Area Calculation: Traditional Methods

Module II:

- Globes: Concept and Types
- Maps: Concept and Types
- Traditional Map projections
- Enlargement and Reduction of the Maps

Module III:

- Understandings Topographic Maps
- Representation of Relief features
- MSL and Datum
- Cartographic Techniques
- New Map Policy of India.

Module IV:

- AutoCAD map: History
- Applications of AutoCAD
- Interfaces of AutoCAD
- Working with AutoCAD

Reference:

1. Singh L. R. Fundamentals of Practical Geography, Sharda Pustak Bhawan, Allahabad, 2016.
2. Sarkar, A. Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi, 2015.
3. Singh Gopal. Map Work and Practical Geography. Vikas Publishing, New Delhi. 2012
4. Singh, R.L. Elements of Practical Geography. Kalyani, New Delhi. 1991
5. AutoCAD Manual

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of Cartography and AutoCAD.

Skills

The learner can have skills of cartography and the same can be applied during the skill component.

General competence

The learner can have conceptual clarification before starting mapping. It will result in quality thematic mapping.

Required Previous Knowledge

Any previous knowledge is not necessary to learn the course.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

General Component Paper III: Introduction to GIS

Course Code: BGVRMG13 **Credits: 3** **Lectures: 45**

Objective:

- To provide fundamentals of GIS.

Module I:

Basics of Computer: Hardware, Software, Input Device, Output Device, Computer Language. Introduction to GIS: Definitions of GIS, Components of GIS, Spatial Data Characteristics and Representation, Spatial and Non-Spatial Data, Raster, Vector, Attribute data Structure. Overview of GIS Software.

Module II:

Coordinate Systems and Projections: Spheroid, World Geodetic System, North American Datum, Everest Datum, Horizontal coordinate systems, Vertical coordinate systems, Conic, Cylindrical, Planer, UTM, Mercator projection, limitations and uses of projections.

Module III:

Data Storing: Methods of Storing Vector and Raster Data. GIS Database: File Geo-Database, Personal Geo-Database, ArcSDE, and Data Access. Data Quality: Accuracy, Precision, Error, and Uncertainty. Errors: Types of Error, Sources of Errors, Correction of Errors.

Module IV:

Q-GIS: Fundamentals, History, and Development, Applications, Basic Operations in Q-GIS

References:

1. Peter A. Burrough and Rachael A. McDonnell, 2011, Principles of Geographic Information Systems, Oxford University Press.
2. Ian Heywood, Sarah Cornelius, and Steve Carver, An Introduction to Geographic Information System, 2010, third edition, Pearson Education Ltd.
3. David O' Sullivan and David J. Unwin, 2010, Geographic Information analysis, second edition, John Wiley & Sons.
4. Paul a. Longley, Michael F. Goodchild, David J. Maguire, David W. Rhind, 2011, Geographic Information Systems and Science, third edition, John Wiley & Sons.
5. John R. Jenson and Ryan R. Jensen, 2013, Introductory Geographic Information system, Pearson Education.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of GIS.

Skills

The learner can have skills required for GIS Mapping and the same can be applied during the skill component.

General competence

The learner can have conceptual clarification before starting learning Q-GIS. It will result in quality thematic mapping.

Required Previous Knowledge

Any previous knowledge is not necessary to learn the course.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

General Component Paper IV: Computer Fundamentals for Office Automation

Course Code: BGVRMG13 **Credits: 3** **Lectures: 45**

Objective:

- To provide Computer Fundamentals for Office Automation

1. Introduction to MS Word:

Introduction to word, the word window, Create a new document, Save, open and print document, Editing document, Formatting a Document, Insert elements to word document, Changing Layout of the document, Working with Tables, Spelling and grammar check, Autocorrect.

2. Spread Sheet Using MS Excel

Sheet Introduction, editing and formatting of cells and rows, Print Preview and Page Layout, Formula bar, Cell Referencing - Relative, Absolute, Mixed Useful functions from Function Library, What if Analysis, Calculative Examples like salary sheet, mark sheet, etc., Conditional formatting, Data sorting and Filter, Types of the different chart and editing charts.

3. Presentation Using MS PowerPoint

Introduction to Powerpoint, Inserting new slide, Different layout of slide, Inserting date, slide number, movie, sound, object, header and footer, Designing slide, Theme, and background, Custom animation, Slide transition, Rehearse timings, Slide show, Setup slide show, Hide slide, Different views of a slide, Use of slide master, Printing hand out, slide.

4. Internet:

Introduction to Internet, Use of Internet, Applications of the Internet, World wide web (web page, web site, web client and webserver), Web browsers, Search engines, Email, Blogs and Forums, Social media and chatting, Bookmarks, Internet Search, Basic search, Tips and Tricks for search, How to download and upload?

Reference Books

1. Windows-98 6 in 1 Practice Hall Publications.

2. ABC of Word 97 by BPB Publication.

3. ABC of Excel by BPB Publication.
3. Computer Fundamentals P.K. Sinha by BPB Publication.

4. Internet-An Introduction, TATA McGraw Hill Publication.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of Word, Excel, and PowerPoint.

Skills

The learner can use Word, Excel, and PowerPoint very effectively. It will be helpful for the project report writing and its management.

General competence

The learner can start his business as a service provider regarding Word, Excel, and PowerPoint.

Required Previous Knowledge

No previous knowledge is required.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping, Banking and Financial Services, and Sustainable Agriculture. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

BACHELOR OF VOCATION
Geoinformatics for Village Resource Mapping:
(to be implemented from 2020-21)
Semester-II

Code	Paper	Credits	H/Wk	Total Hours
Skill Component				
BGVRMS21	GNSS and Total Station Surveying	4	8	120
BGVRMS22	Advanced Spatial Analysis - ArcGIS	4	8	120
BGVRMS23	Web GIS	4	8	120
BGVRMS24	Communication Skills	4	8	120
BGVRMS25	Life Skills	2	4	60
	Total	18	36	540
General Component				
BGVRMG -21	GNSS and Total Station Surveying	3	3	45
BGVRMG -22	GIS Analysis	3	3	45
BGVRMG -23	Web GIS	4	4	60
BGVRMG -24	Communication Skills	3	3	45
	Total	3	3	45

Course Code details:
BGVRM- B. Voc. in Geoinformatics for Village Resource Mapping
S:- Skill Component

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER II

Skill Component Paper I: GNSS and Total Station Surveying

Course Code: BGVRMS21 **Credits: 4** **Hours: 120**

Objective:

- To provide practical experiments of GNSS and Total Station Survey

1. Projection and Datum Defining
2. Demarcation of Point Segment - Using Handheld GNSS
3. Demarcation of Line Segment - Using Handheld GNSS
4. Demarcation of Area Segment - Using Handheld GNSS
5. Area Calculation - Using Handheld GNSS
6. Demarcation of Point Segment - Using Smartphone-Based GNSS
7. Demarcation of Line Segment - Using Smartphone-Based GNSS
8. Demarcation of Area Segment - Using Smartphone-Based GNSS
9. Area Calculation - Using Smartphone-Based GNSS
10. Geotagging of photographs
11. Assessment of Locational Accuracy
12. Preparation of a Map using GNSS segments
13. Geodetic and Planar Survey
14. Parts of Total Station
15. Leveling and Prism Adjustment
16. Open and Closed Traversing
17. Dimension Measurements.
18. Contouring.
19. E-Transmittal.
20. Block Generation.

Reference:

1. GNSS Manuals
2. Total Station Manual

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the techniques of GNSS and Total Station Survey.

Skills

The learner can survey any land parcel using handheld GNSS, Smartphone-based GNSS & ETS and prepare a valid map of the same parcel.

General competence

The learner can start a consultancy service for land surveying, and it will boost the better planning and management of the land resources available in the area.

Required Previous Knowledge

Knowledge of the fundamentals of surveying, GNSS, and Total Station is necessary. The same will be covered through the first semester of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER II

Skill Component Paper II: Advanced Spatial Analysis – ArcGIS

Course Code: BGVRMS22 **Credits: 4** **Lectures: 120**

Objective:

- To inculcate skills of mapping land parcels surveyed through various traditional techniques.

1. Georeferencing (using GCP, Image to Image)
2. Creation of Shapefile (Point, Line, Polygon),
3. Creation of Personal Geodatabase,
4. Creation of File Geodatabase.
5. Correction of Topology, Error Identification, and Correction.
6. Creation of Attribute Data: Manual Entering, Join and Relate Table, Preparation of Charts Using Attribute Table.
7. Vector-Based Queries: Spatial, Attribute, and Graphic Queries.
8. Preparation of Thematic Map: Dot Density Map, Choropleth Map, Location Chart Map, Proportional Symbol Map.
9. Overlay Analysis: Vector Overlay, Raster Overlay.
10. Hydrology Analysis: Watershed Delineation, Flow Direction, Flow Accumulation, and Stream Order Creation.
11. Multivariate Analysis: Iso Cluster Unsupervised Classification.
12. Model Builder, Preparation of Toolbox, Toolset, and Tools.

References:

1. Arc-GIS Desktop Manual

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the functioning of the Arc-GIS Map and spatial analysis using Arc-GIS Desktop.

Skills

The learner can prepare, digitize, and edit a map using Arc-GIS and can interlink spatial data with non-spatial data.

General competence

The learner can analyse the spatial data and make decisions based on spatial and non-spatial information.

Required Previous Knowledge

Knowledge of the fundamentals of map scales and map projections is necessary before starting to learn the course. The same will be provided through the General Component paper during the first semester of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper III: Web GIS

Course Code: BGVRMS23 **Credits: 4** **Hours: 120**

Objective:

- To skill the learner for Web-based GIS mapping of spatial and non-spatial data.

1. Working with Google Earth
2. Working with Google Maps
3. Online Geocoding / Reverse Geocoding
4. ISRO Bhuvan Portal
5. censusgis.org
6. Open Street Map
7. Wikimapia.org
8. Bharatmaps.gov.in
9. State GIS Portals
10. WMS Servers and Data Visualisation.

References:

1. Getting to Know WebGIS: Pinde Fu, ESRI
2. Learning PHP, MySQL, and JavaScript: Robin Nixon
3. OpenLayers Cookbook; Antonio Santiago Perez

Web Resources:

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.codeacademy.com

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the functioning of the Web GIS and its utilities.

Skills

The learner can plan, prepare, and organize a Web-GIS map and can interlink spatial data with non-spatial data for decision making.

General competence

The learner can assist a builder, government, and non-government agencies for the preparation of a Web-GIS portal.

Required Previous Knowledge

Knowledge of the fundamentals of GIS, map scales, and map projections is necessary before starting to learn the course. The same will be provided through the General Component paper and skill components covered during the first semester and second semester of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper IV: Communication Skills

Course Code: BGVRMS24 **Credits: 4** **Hours: 120**

Objective:

- The main objective of the course is to inculcate communication skills among the learners.

1. Media, modes, and barriers to communication – case study
2. Listening skills – listening audio - video
3. The art of speaking, writing and presenting – creating various documents and speech competitions
4. Group discussion skills – organizing group discussions
5. Sales conversation
6. Creating a model of feedback
7. Interview skills - organization of mock interviews

References:

1. Alien, R.K.(1970) Organisational Management through Communication.
2. Ashley, A(1992) A Handbook Of Commercial Correspondence, Oxford University Press.
3. Bahl, J. C., and Nagamia, S. M. (1974) Modern Business Correspondence and Minute Writing.
4. Balan, K. R., and Rayudu C.S. (1996) Effective Communication, Beacon New Delhi.
5. Ghanekar, A(1996) Communication Skills for Effective Management. Everest Publishing House, Pune.
6. Benjamin, James (1993) Business and Professional Communication Concepts and Practices, Harper Collins College Publishers, New York.
7. Bovee Courtland, L, and Thrill, John V(1989) Business Communication, Today McGraw Hill, New York, Taxman Publication.
8. Eyre, E.C. (1985) Effective Communication Made Simple, Rupa, and Co. Calcutta.
9. Ecouse Barry, (1999), Competitive Communication: A Rhetoric for Modern Business, OUP.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the functioning communications.

Skills

The learner can acquire and apply the skills of communication for effective listening, speaking, reading, and writing,

General competence

The learner can communicate effectively and it will help seek the job and effective management of their business.

Required Previous Knowledge

No previous knowledge is necessary.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping, Banking and Financial Services, and Sustainable Agriculture. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

Skill Component Paper IV: Life Skills

Course Code: BGVRMS25 **Credits:2** **Hours: 60**

Objective:

Under this course, the student can have a choice to opt for the course from the following.

- Yoga
- NSS
- NCC
- Fine Art
- Basic Mathematics, etc.

The syllabus for the course is given under the course list of Sustainable Agriculture

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of life Skills.

Skills

The learner can have the skills required to live a happy and healthy life.

General competence

The learner can manage time and stress very effectively.

Required Previous Knowledge

No previous knowledge is required.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping, Banking and Financial Services, and Sustainable Agriculture. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER II

General Component Paper I: GNSS and Total Station Survey

Course Code: BGVRMG21 **Credits: 3** **Lectures: 45**

Objective:

Module I:

Introduction; History of Navigation and Positioning; Objectives, Types of Earth's Positioning System- GPS, GALILEO and GLONASS; Comparison of Main Parameters for GPS, GLONASS and GALILEO; Basics Geodesy, Geoid/ Datum/Ellipsoid-Definition, and Basic Concepts; Datum Transformations; Map Projections

Module II:

GPS Components – space segment, the control segment, user segment; GPS Receiver and its Types; GPS Errors. GPS Positioning Modes: GPS point positioning, GPS relative positioning; RTK GPS.

Module III:

Total Station Survey: Concept, Components, functions, principles, and Methods of Surveying,

Module IV:

Applications of GNSS and Total Station- Route Navigation, Forestry, and Natural Resources, GPS Tracking, Utility Mapping, Civil Engineering, Cadastral Surveying, and Seismic Applications

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the techniques of GNSS and Total Station Survey.

Skills

The learner can survey any land parcel using handheld GNSS , Smartphone-based GNSS & ETS and prepare a valid map of the same parcel.

General competence

The learner can start a consultancy service for land surveying, and it will boost the better planning and management of the land resources available in the area.

Required Previous Knowledge

Knowledge of the fundamentals of surveying is necessary. The same will be covered through the first semester of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER II

General Component Paper II: GIS Analysis

Course Code: BGVRMG22 **Credits: 3** **Lectures: 45**

Objective:

- To provide practical experiments of Geostatistical Analysis.

Module I:

Data Types; Spatial Data; Non-Spatial Data, Data Input; Existing GIS Data, Metadata; Conversion of Existing Data, Creating New Data, Data Models; Vector Data Model; Raster Data Model; Integration and Comparison of Vector and Raster Data Models.

Module II:

Types of Digitizing Errors, Locational Errors- Location Errors Using Secondary Data Source, Location Errors Using Primary Data Source, Causes for Digitizing Errors; Topological Errors- Topological Errors With Geometric Features, Topological Errors Between Layers; Topological Editing and Non-topological Editing; Other Editing Operations; Editing Using Topological Rules.

Module III:

Attribute Data in GIS, Attribute Data Entry, Manipulation of Fields and Attribute Data, Data Exploration; Attribute Data Query, Raster Data Query, Map-Based Data Manipulation.

Module IV:

Raster Data Analysis-Location Operations; Neighborhood Operations, Zonal Operations, Other Raster Data Operations; Vector Data Analysis-Buffering, Overlay, Distance Measurement, Pattern Analysis, Map Manipulation

Reference:

1. ArcGIS desktop Manual
2. Tomislav Hengl (2009) A Practical Guide to Geostatistical Mapping, ISBN 978-90-9024981-0.
3. J¨urgen Pilz (2009) Interfacing Geostatistics and GIS, Springer, ISBN: 978-3-540-33235-0

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the fundamentals of GIS.

Skills

The learner can prepare a map using the GIS software.

General competence

The learner can start a consultancy service for land surveying, and it will boost the better planning and management of the land resources available in the area.

Required Previous Knowledge

Knowledge of the fundamentals of cartography is necessary. The same will be covered through the first semester of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER II

General Component Paper III: Web GIS

Course Code: BGVRMG13 **Credits: 3** **Lectures: 45**

Objective:

- To provide fundamentals of surveying and cartography.

Module I:

Concepts and Principles of Web GIS; Definition and History of Web GIS; Significance of Web GIS; Internet GIS; Open Source GIS; Web-Based GeoPortal.

Module II:

Elements of Web GIS: The web as a source of spatial data; Maps on the Web; Querying and visualizing geographic information on the web; The Web as an integral part of GIS; Geographic Markup Language (GML); GML Features; GML Application Schema;; Visualization of GML; Development of GML Prototype.

Module III:

Architectures for Delivering Web Services- three-tier architecture for web GIS; Interoperability and the Open-GIS Consortium- open web services framework (OSF); Web components- the browser, the server, the hypermedia document and the Uniform Resource Locator (URL); presentation and interaction with geographic information on web.

Module IV:

Web Services and Applications of Web GIS

Web Map Services (WMS), Web Feature Services(WFS), Catalogue Service on Web (CSW), Web Registry Service (WRS), Web Coverage Service (WCS), ASP (Active Server Pages)– Introduction, scripting in ASP; India GeoPortal; State GeoPortal and District GeoPortal. Vehicle Tracking System, Mobile mapping, Location Based Services, Intelligent transportation systems

References:

1. Getting to Know WebGIS: Pinde Fu, ESRI
2. Learning PHP, MySQL, and JavaScript: Robin Nixon
3. OpenLayers Cookbook; Antonio Santiago Perez

Web Resources:

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.codeacademy.com

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the functioning of the Web GIS and its utilities.

Skills

The learner can plan, prepare, and organize a Web-GIS map and can interlink spatial data with non-spatial data for decision making.

General competence

The learner can assist a builder, government, and non-government agencies for the preparation of a Web-GIS portal.

Required Previous Knowledge

Knowledge of the fundamentals of GIS, map scales, and map projections is necessary before starting to learn the course. The same will be provided through the General Component paper and skill components covered during the first semester and second semester of the program.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

B. Voc. in Geoinformatics for Village Resource Mapping

SEMESTER I

General Component Paper IV: Communication Skills

Course Code: BGVRMG14 **Credits: 3** **Lectures: 45**

Module 1

The concept of communication, The objectives of communication, Channels of communication, Methods of communication, Media and modes, Barriers to communication
Listening skills (breaking the barriers)

Module 2

Communication basics, Art of speaking, Art of Writing, Art of discussing and presenting, Group presentation, Interim assessment, and doubt clearing

Module 3

Art of persuasion and influence, Facing and rejection and non-conversion, Art of having a sales conversation, Integrated session with banking and insurance, Collection letters

Module 4

Art of giving feedback, Customer service skills, Power of belief, Interview skills, Mock interviews

Reference Books:

1. Alien, R.K.(1970) Organisational Management through Communication.
2. Ashley, A(1992) A Handbook Of Commercial Correspondence, Oxford University Press.
3. Bahl, J. C., and Nagamia, S. M. (1974) Modern Business Correspondence and Minute Writing.
4. Balan, K. R., and Rayudu C.S. (1996) Effective Communication, Beacon New Delhi.
5. Ghanekar, A(1996) Communication Skills for Effective Management. Everest Publishing House, Pune.
6. Benjamin, James (1993) Business and Professional Communication Concepts and Practices, Harper Collins College Publishers, New York.
7. Bovee Courtland, L, and Thrill, John V(1989) Business Communication, Today McGraw Hill, New York, Taxman Publication.
8. Eyre, E.C. (1985) Effective Communication Made Simple, Rupa, and Co. Calcutta.
9. Ecouse Barry, (1999), Competitive Communication: A Rhetoric for Modern Business, OUP.

Learning Outcomes

On completion of the course, the learner will have the following learning outcomes defined in terms of knowledge, skills, and general competence.

Knowledge

The learner will understand the functioning communications.

Skills

The learner can acquire and apply the skills of communication for effective listening, speaking, reading, and writing,

General competence

The learner can communicate effectively and it will help seek the job and effective management of their business.

Required Previous Knowledge

No previous knowledge is necessary.

Access to the Course

The course is available for all the learners admitting for Bachelor of Vocation in Geoinformatics for Village Resource Mapping, Banking and Financial Services, and Sustainable Agriculture. Besides, any UG and PG learner can opt for the course as a value addition.

Forms of Assessment

The assessment will be carried out by the Sector Skill Council/ Assessment Board formulated according to NSQF/ NSDC guidelines. The proficiency of the skills will be certified by the assessment board.

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade in the grading scale, grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.