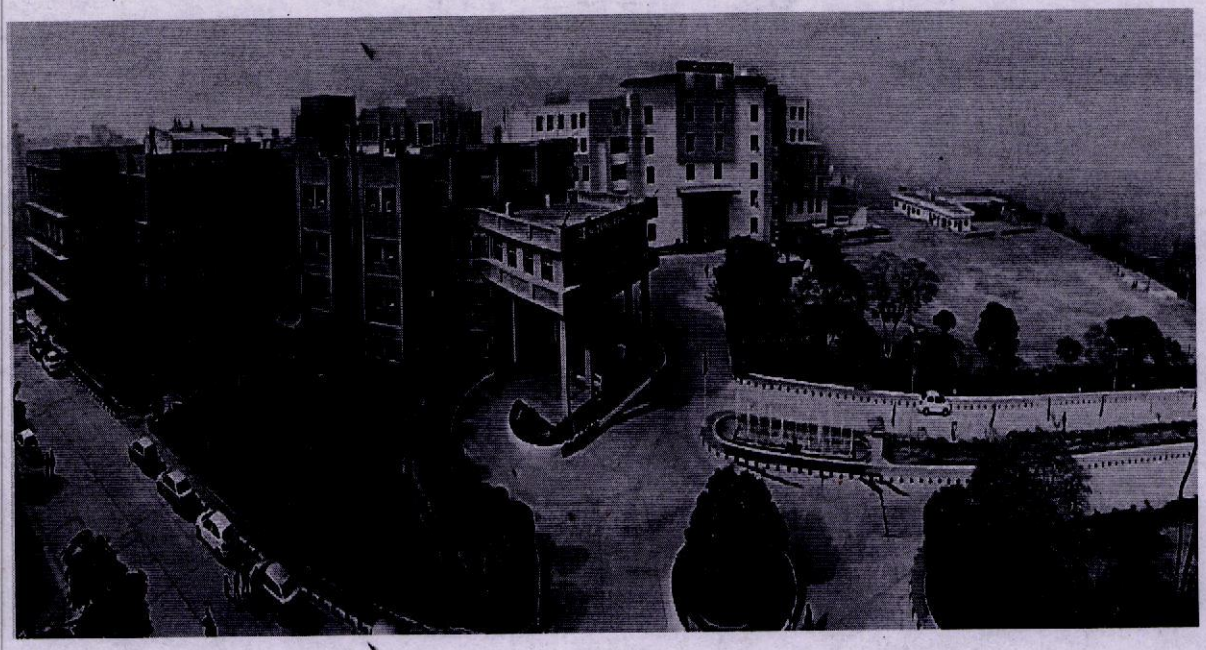
SGT University, Chandu-Budhera, Gurugram
Faculty of Engineering & Technology
Department of Civil Engineering



M. Tech. **Geotechnical Engineering**

Registrar
SGT University
Budhera, Gurugram

Scheme & Syllabus (2021-22)

Vision of SGT University

"Driven by Research & Innovation, we aspire to be amongst the top ten Universities in the Country by 2022

Geotechnical Engineering
First Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1.		Advanced Soil Mechanics	3	0	0	3	60	40	100
2.		Ground Improvement Techniques	3	0	0	3	60	40	100
3.		Earth retaining structures	3	0	0	3	60	40	100
4.		Design of pavements	3	0	0	3	60	40	100
5.		Experimental soil Mechanics Lab	0	0	2	1	40	60	100
6.		Computer application in Engineering Lab	0	0	2	1	40	60	100
7.		Value Added Courses-I	2	0	0	2	60	40	100
8.		Seminar	0	0	2	1	00	100	100
		Total	**14**	**0**	**6**	**17**	**380**	**420**	**800**

Second Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Rock Mechanics	3	0	0	3	60	40	100
2		Advanced Foundation Engineering	3	0	0	3	60	40	100
3		Soil Dynamics and Machine Foundations	3	0	0	3	60	40	100
4		Soil strength behavior	3	0	0	3	60	40	100
5		Rock Mechanics Lab	0	0	2	1	40	60	100
6		Advanced Geotechnical Laboratory	0	0	2	1	40	60	100
7		Seminar	0	0	2	1	00	100	100
		Total	**12**	**0**	**6**	**15**	**320**	**380**	**700**

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Third Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Earth & Rock fill Dams	3	0	0	3	60	40	100
2		Research Methodology & IPR	3	0	0	3	60	40	100
3		Department Electives-XIII	3	0	0	3	60	40	100
4		Department Electives-XIV	3	0	0	3	60	40	100
5		Department Electives-XV	3	0	0	3	60	40	100
6		Research Methodology & IPR Lab	0	0	2	1	40	60	100
7		Department Electives Lab-XIII	0	0	2	1	40	60	100
8		Department Electives Lab-XIV	0	0	2	1	40	60	100
9		Department Electives Lab-XV	0	0	2	1	40	60	100
10		Value Added Courses-II	2	0	0	2	60	40	100
		Total	**17**	**0**	**8**	**21**	520	480	1000

Fourth Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Dissertation	0	0	20 W	20	100	0	100
		Total	0	0	20 W	20	**100**	0	**100**

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Departmental Electives

S. No.	Specialization	Departmental Elective XIII	Departmental Elective XIV	Departmental Elective XV
5	Geotechnical Engineering	Strength and Deformation Behaviour of soil 3-0-2 (4) / Computational Methods in Geotechnical Engg 3-0-2 (4)	Construction Methods and Equipment 3-0-2 (4) / Advanced Pavement Materials 3-0-2 (4)	Advanced Surveying and Cartography 3-0-2 (4) / Offshore Foundations 3-0-2 (4)

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Curriculum
(Scheme of Examination)
&
Syllabus for
M.Tech
Geo-informatics and Remote Sensing

Batch 2021 onwards

SGT University Gurgaon

Credit Based Scheme w.e.f. 2021-2022

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Scheme of Examination for M.Tech– Geo-informatics and Remote Sensing Program

SEMESTER WISE COURSE STRUCTURE

First Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Geographical Information System	3	0	0	3	60	40	100
2		Photogrammetric & Remote Sensing	3	0	0	3	60	40	100
3		Remote Sensing & GIS for Hydrology and Water Resources	3	0	0	3	60	40	100
4		Emerging Trends in Geoinformatics	3	0	0	3	60	40	100
5		Photogrammetric & Remote Sensing Lab	0	0	2	1	40	60	100
6		Computer application in Engineering Lab	0	0	2	1	40	60	100
7		Value Added Courses-I	2	0	0	2	60	40	100
8		Seminar	0	0	2	1	00	100	100
		Total	**14**	**0**	**6**	**17**	**380**	**420**	**800**

Second Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Digital Image Processing	3	0	0	3	60	40	100
2		GPS & Electronic Surveying	3	0	0	3	60	40	100
3		Pattern Recognition and Machine Learning	3	0	0	3	60	40	100
4		Remote Sensing & GIS for Urban Planning and Management	3	0	0	3	60	40	100
5		Digital Image Processing Lab	0	0	2	1	40	60	100
6		GPS Lab	0	0	2	1	40	60	100
7		Seminar	0	0	2	1	00	100	100
		Total	**12**	**0**	**6**	**15**	**320**	**380**	**700**

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Scheme of Examination for M.Tech– Geo-informatics and Remote Sensing Program

SEMESTER WISE COURSE STRUCTURE

Third Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Basics and Digital Cartography	3	0	0	3	60	40	100
2		Research Methodology & IPR	3	0	0	3	60	40	100
3		Department Electives-XIII	3	0	0	3	60	40	100
4		Department Electives-XIV	3	0	0	3	60	40	100
5		Department Electives-XV	3	0	0	3	60	40	100
6		Research Methodology & IPR Lab	0	0	2	1	40	60	100
7		Department Electives Lab-XIII	0	0	2	1	40	60	100
8		Department Electives Lab-XIV	0	0	2	1	40	60	100
9		Department Electives Lab-XV	0	0	2	1	40	60	100
10		Value Added Courses-II	2	0	0	2	60	40	100
		Total	**17**	0	**8**	**21**	520	480	1000

Fourth Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Dissertation	0	0	20	20	100	0	100
		Total	**0**	**0**	**20**	**20**	100	0	100

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Departmental Elective

S. No.	Specialization	Departmental Elective XIII	Departmental Elective XIV	Departmental Elective XV
1	Geoinformatics & Remote Sensing	Advanced Surveying and Cartography 3-0-2(4)	Applications of Remote Sensing in Geosciences 3-0-2(4)	Non-Topographic Photogrammetry 3-0-2(4)

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1. Name of the Department		**CIVIL ENGINEERING**					
2. Subject Name	**Advanced Surveying and Cartography**	**L**	**T**		**P**		
3. Subject Code		3	0		0		
4. Type of Subject (use tick mark)		**Core ()**	**PE (√)**		**OE()**		
5. Pre-requisite (if any)	nil	**Frequency (use tick marks)**	Even ()	Odd (✓)	Either Sem ()	Every Sem ()	

6. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)

Lectures = 42	**Tutorials = 00**	**Practical =00**

Brief Syllabus:
Students will learn the concept of advanced Surveying

7. Learning objectives:

1. To teach the students about the Triangulation and Trilateration
2. To enable the students to understand the Photogrammetry and Remote Sensing

8. Subject Outcomes:

On completion of this course, the students will be able to

1. Understand the concept of advanced surveying
2. Understanding the concept of field survey and field astronomy.

9. Unit wise detailed content

Unit-1	**Number of lectures = 10**	**Title of the unit: Triangulation, Trilateration and Adjustment Computations**

Triangulation and Trilateration : Necessity of Control Surveying, Principle of Triangulation and Trilateration classification of Triangulation Systems Station Marks, Towers and Signals, Satellite station, Intersected and Resected points, Reconnaissance, Indivisibility of stations, Angular Measurement, Base line measurement and its extension

Adjustment Computations: Treatment of random errors, Normal law of errors, Most Probable Value, Weight of observations, Propagation of errors and variances, Principle of Least Squares, Observations and correlative Normal Equations, Adjustment of triangulation figures and level nets.

Unit - 2	**Number of lectures = 10**	**Title of the unit: Curves and project survey**

Curves: Classification of curves, Elements of Simple Circular, Transition and Vertical curves, Theory and methods of setting out circular, transition and vertical curves, special field problems.

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Project Surveys: General requirements and specifications for Engineering project surveys, Reconnaissance, Preliminary and Location surveys for highways, railways and canals, Correlation of surface and underground surveys in case of culverts, Bridges and Tunnels; Principles and practice of hydrographic surveys, Layout of culverts, canals, bridges and buildings.

Unit - 3	Number of lectures = 10	Title of the unit: Field Astronomy:

Field Astronomy: Astronomical terms, co-ordinate systems, Spherical trigonometry, Astronomical triangle, Relationship between coordinates.

Unit – 4	Number of lectures = 12	Title of the unit: Photogrammetry ,Remote Sensing, GPS and GIS

Photogrammetry and Remote Sensing: Photogrammetry-Introduction, Scale of photograph, Tilt and height displacement, Stereoscopic vision and stereoscopes, Techniques of photo-interpretation, Principles of remote sensing, Electro Magnetic Radiation (EMR), energy interaction with atmosphere and earth features, spectral signatures, Remote sensing satellites and their data products, methods of interpretation of remotely sensed data.

GPS and GIS: Global Positioning System (GPS)-Introduction, principle, and applications of GPS in different fields of Surveying, Geographic Information System (GIS) – Introduction, Geographical concepts and terminology, Applications of GIS

10. Brief Description of self learning / E-learning component

The students will be encouraged to learn using the SGT e-Learning portal and choose the relevant lectures delivered by subject experts of SGT University.

The link to the E-Learning portal.

https://elearning.sgtuniversity.ac.in/course-category/

Journal papers; Patents in the respective field.

11. Books Recommended

Text Books

1 Agor, R., "Surveying", Vol. II & III, Khanna Publications, Delhi, 1995.
2. Arora, K.R., "Surveying", Vol. II & III, Standard Book House, Delhi. Bannister, A. And Baker, R., "Solving Problems in 3 Surveying, "Longman Scintific Technical, U.K., 1994.
5. Punmia, B.C., "Surveying", Vol.II & III Laxmi Publications, New Delhi.

Reference books

1. Duggal S.K., Surveying Vol. I & II TMH Basak, Surveying TMH. Kanetkar, Surveying Chandra, A.M. "Plane Surveying", New Age International Publisher,

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2. Cromley .R. G, "Digital Cartography". Prentice-Hall of India, New Delhi, 1992.
3. Dent, B. D., "Cartography – Thematic Map Design",. 5th" Edition, W C B McGraw-Hill, Boston, 1999.
4. Rampal .K.K, "Mapping and Compilation". Concept Publishing Co., New Delhi, 1993.

1. Name of the Department		CIVIL ENGINEERING				
2. Subject Name	Advanced Surveying and Cartography Lab	L	T		P	
3. Subject Code		0	0		2	
4. Type of Subject (use tick mark)		Core ()	PE(✓)		OE()	
5. Pre-requisite (if any)	Nil	5. Frequency (use tick marks)	Even ()	Odd (✓)	Either Sem ()	Every Sem ()
7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)						
Lectures = 00		Tutorials = 00	Practical = 28			

8. Brief Syllabus: This course explores how geographic information systems and related technologies (global positioning systems, remote sensing, etc.) can be used to promote and support the construction and simulation of dynamic models of human and environmental systems.

9. Learning objectives:

1. To teach the students about the Triangulation and Trilateration
2. To enable the students to understand the Photogrammetry and Remote Sensing

10. Subject Outcomes:

On completion of this course, the students will be able to perform/Understand:-

1. Understand the concept of advanced surveying
2. Understanding the concept of field survey and field astronomy.
3. Understanding the concept of Photogrammetry
4. Understanding the concept of Remote Sensing,
5. Understanding the concept of GPS and GIS

11. Unit wise detailed content

Sr. No.	Title
1.	Study of Principle of Triangulation and Trilateration
2	Study of Satellite station, Intersected and Resected points, Reconnaissance, Indivisibility of stations
3	Study of Propagation of errors and variances
4	Study of Adjustment of triangulation figures and level nets.
5	Theory and methods of setting out circular, transition and vertical curves,
6	General requirements and specifications for Engineering project surveys
7.	Study of Applications of GIS

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1. Name of the Department		**CIVIL ENGINEERING**				
2. Course Name	Application of Remote Sensing in Geosciences	**L**	**T**		**P**	
3. Course Code		3	0		0	
4. Type of Course		**Core ()**	**PE(✓)**		**OE()**	
5. Pre-requisite (if any)		**6. Frequency (use tick marks)**	Even ()	Odd (✓)	Either Sem ()	Every Sem ()

7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)

Lectures = 42	**Tutorials = 00**	**Practical = 00**

Brief Syllabus: Basic Introduction to Remote Sensing, Basic Spatial Analysis and Urban Mapping, Concept of Urban Planning, Urban Disaster Management.

8. Learning objectives:

1. To give the students an insight about Remote Sensing.
2. To study different concepts of Urban Planning and Urban Mapping.

9. Course Outcomes:

At the end of the syllabus, students will be able to understand the

1. Knowledge about Remote Sensing.
2. Understanding concepts of Urban Planning and Urban Mapping.

10. Unit wise detailed content

Unit-1	**Number of lectures = 10**	**Title of the unit: Basic Introduction and Understanding**

An overview of - origin of earth, structure of earth, geological time scale, plate tectonics and continental drift, rocks and minerals, different geomorphic processes. Applications of remote sensing and GIS in mineral targeting, geomorphologic studies, engineering geological studies, litho logical and structural mapping. Hydrological cycle, river systems and river dynamics, river morph metric analysis, wetlands mapping and monitoring, watershed concept and its management, behavior of different Remote Sensing sensors in surface water studies.

Unit - 2	**Number of lectures = 10**	**Title of the unit: Urban Mapping and Spatial Analysis**

Urban process, the physical structure and composition of urban areas, Urbanization process, growth trend, problems of urbanization, information requirements for perspective planning, Scale and resolution concepts and interpretation techniques for urban and regional analysis, urban GIS, spatial analytical techniques, statistics and visualization, conceptual modeling of urban processes; Urban Sprawl: Change detection in Land Use Land Cover monitoring physical growth of urban area, trends in urban sprawl and associated problems.

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Unit - 3	**Number of lectures =10**	**Title of the unit: Urban Planning**
Plans – planning needs, types of plans, urban and regional planning; LU/LC mapping Urban Planning: Zoning of Land Use, Zonal Land Use Plan, Object oriented GIS data modeling for urban design, landscape architecture, urban infrastructure, Site selection for urban development, site suitability analysis for utilities and civic amenities, interim master plan, Master Plan.		
Unit - 4	**Number of lectures =12**	**Title of the unit: Urban Disaster and Emergencies Management**
Mapping vulnerable zones with respect to earth quake, flood, fire, terrorist attacks, and finding optimum routes for ambulances, and emergency services, GIS modeling for Hazard risk and emergencies management		

11. Brief Description of self-learning / E-learning component

1. https://elearning.iirs.gov.in/
2. https://elearning.iirs.gov.in/e-Learning.html
3. https://gis.e-education.psu.edu/remote_sensing

12. Books Recommended

TEXT BOOKS

1. Remote Sensing of Geology Prof. R.P.Gupta
2. Geomorphological process Savindra Singh
3. Remote Sensing in Geosciences Nitin K. Tripathi & Vishwanath Bajpai
4. Earth Surface System Richard J. Huggett

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1. Name of the Department		**CIVIL ENGINEERING**				
2. Subject Name	Application of Remote Sensing in Geosciences Lab	**L**	**T**		**P**	
3. Subject Code		0	0		2	
4. Type of Subject (use tick mark)		**Core ()**	**PE(✓)**		**OE()**	
5. Pre-requisite (if any)	Nil	**6.Frequency (use tick marks)**	Even ()	Odd (✓)	Either Sem ()	Every Sem ()
6. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)						
Lectures = 00		**Tutorials = 00**	**Practical = 28**			

7. Brief Syllabus: Basic Introduction to Remote Sensing, Basic Spatial Analysis and Urban Mapping, Concept of Urban Planning, Urban Disaster Management

8. Learning objectives:

1. To give the students an insight about Remote Sensing.
2. To study different concepts of Urban Planning and Urban Mapping.

9. Subject Outcomes:

At the end of the syllabus, students will be able to understand the

1. Knowledge about Remote Sensing.
2. Understanding concepts of Urban Planning and Urban Mapping.

10. Unit wise detailed content

Sr. No.	Title
1.	Study of Applications of remote sensing and GIS in mineral targeting
2	Study of wetlands mapping and monitoring, watershed concept and its management
3	Study of Scale and resolution concepts and interpretation techniques for urban and regional analysis
4	Study of Change detection in Land Use Land Cover monitoring physical growth of urban area
5	LU/LC mapping Urban Planning
6	Mapping vulnerable zones with respect to earth quake
7.	GIS modeling for Hazard risk and emergencies management

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1. Name of the Department		**CIVIL ENGINEERING**				
2. Course Name	Non – Topographic Photogrammetry	**L**	**T**		**P**	
3. Course Code		3	0		0	
4. Type of Course		**Core ()**	**PE(✓)**		**OE()**	
5. Pre-requisite (if any)		**6. Frequency (use tick marks)**	Even ()	Odd (✓)	Either Sem ()	Every Sem ()
7. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)						
Lectures = 42		**Tutorials = 00**	**Practical = 00**			
Brief Syllabus: Basic Introduction to Non – Topographic Photogrammetry						

8. Course Outcomes:

The student will be able to:

1. Understand basic photogrammetric & remote sensing techniques
2. Perform basic photogrammetric office computations
3. Apply Photogrammetry information to professional surveying services
4. Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of Photogrammetry
5. Apply current knowledge and adapt to emerging applications of Photogrammetry and technology
6. Identify, analyze, and solve technical photogrammetric problems
7. Communicate photogrammetric analysis and results effectively

9. Unit wise detailed content

Unit-1	**Number of lectures = 10**	**Title of the unit: INTRODUCTION**
Basic Introduction, Potential of Close Range Photogrammetry, Instrumentation of Data Acquisition, Phototheodolite, Analytical Stereo plotters.		
Unit - 2	**Number of lectures =10**	**Title of the unit: Architecture**
Applications in Architecture and Archaeology, Photomontage by Inverse Photogrammetry.		
Unit - 3	**Number of lectures =12**	**Title of the unit: Industry and Engineering Applications**
Aerospace Industry, Automobile Industry, Measurement of Storage Tanks and Cooling Towers, Model Studies.		
Unit - 4	**Number of lectures = 10**	**Title of the unit: Applications Areas**
X – Ray Photogrammetry Systems, Reverse Projection Techniques, Under water Photogrammetry and Case Studies.		

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10. Brief Description of self-learning / E-learning component

1. https://elearning.iirs.gov.in/e-Learning.html
2. https://gis.e-education.psu.edu/remote_sensing

11. Books Recommended

TEXT BOOKS

1. Juliana Maantay, John Ziegler, John Pickles, GIS for the Urban Environment, Esri Press 2006.
2. Allan Brimicombe, GIS Environmental Modeling and Engineering, CRC; 1 edition 2003.

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1. Name of the Department		CIVIL ENGINEERING				
2. Subject Name	Non – Topographic Photogrammetry Lab	L	T		P	
3. Subject Code		0	0		2	
4. Type of Subject (use tick mark)		Core (√)	PE(✓)		OE()	
5. Pre-requisite (if any)	Nil	Frequency (use tick marks)	Even ()	Odd (✓)	Either Sem ()	Every Sem ()
6. Total Number of Lectures, Tutorials, Practical (assuming 14 weeks of one semester)						
Lectures = 00		Tutorials = 00	Practical = 28			

7. Brief Syllabus: Basic Introduction to Non – Topographic Photogrammetry.

8. Learning objectives:

1. To teach the students about the Triangulation and Trilateration
2. To enable the students to understand the Photogrammetry and Remote Sensing

9. Subject Outcomes:

The student will be able to:

1. Understand basic photogrammetric & remote sensing techniques
2. Perform basic photogrammetric office computations
3. Apply Photogrammetry information to professional surveying services
4. Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of Photogrammetry
5. Apply current knowledge and adapt to emerging applications of Photogrammetry and technology
6. Identify, analyze, and solve technical photogrammetric problems
7. Communicate photogrammetric analysis and results effectively

10. Unit wise detailed content

Sr. No.	Title
1.	Study of Potential of Close Range Photogrammetry
2	Study of Analytical Stereo plotters.
3	Study of Photomontage by Inverse Photogrammetry
4	Measurement of Storage Tanks and Cooling Towers
5	Study of Underwater Photogrammetry
6	Study of Analytical Stereo plotters
7.	Study of X – Ray Photogrammetry Systems

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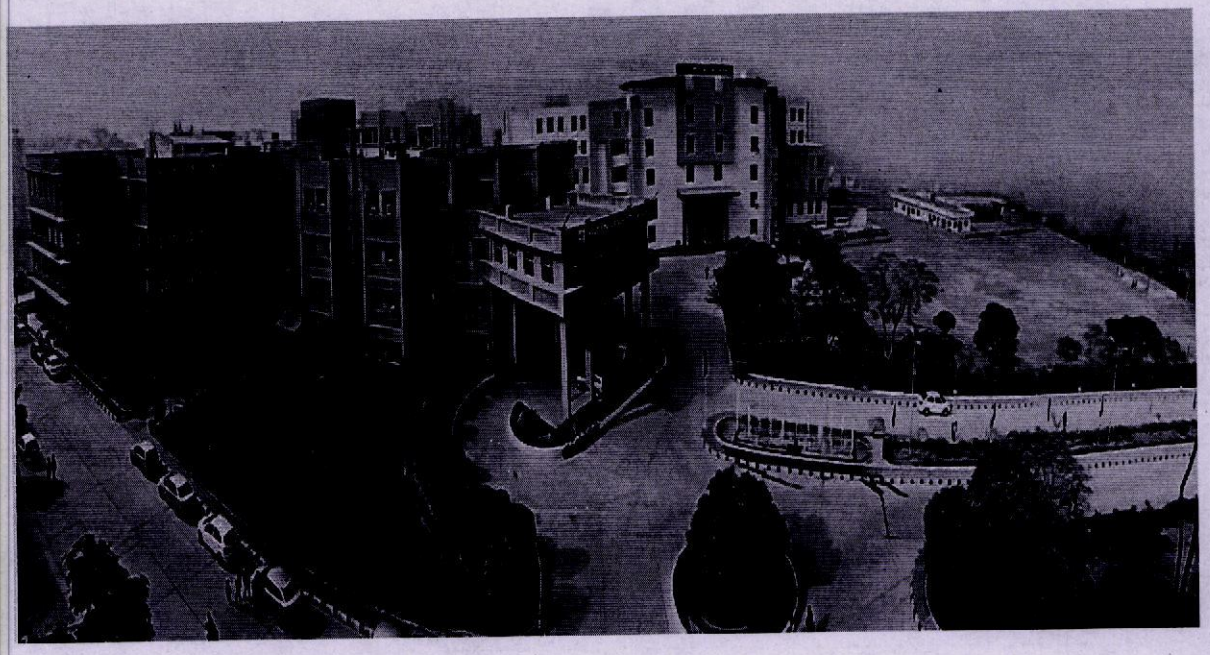
Faculty of Engineering & Technology
Department of Civil Engineering



M. Tech. Water Resource Engineering

Registrar
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Budhera, Gurugram

Scheme & Syllabus (2021-22)

Vision of SGT University

"Driven by Research & Innovation, we aspire to be amongst the top ten Universities in the Country by 2022"

Water Resource Engineering
First Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Advanced Fluid Mechanics	3	0	0	3	60	40	100
2		Surface Water Hydrology and Hydrologic Systems	3	0	0	3	60	40	100
3		Flow and Transport in Porous Media	3	0	0	3	60	40	100
4		Water Quality Modeling and Management	3	0	0	3	60	40	100
5		Flow and Transport in Porous Media Laboratory	0	0	2	1	40	60	100
6		QGIS and SAGA GIS Laboratory	0	0	2	1	40	60	100
7		Value Added Courses-I	2	0	0	2	60	40	100
8		Seminar	0	0	2	1	00	100	100
		Total	**14**	**0**	**6**	**17**	**380**	**420**	**800**

Second Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Water Resources systems analysis and design	3	0	0	3	60	40	100
2		Remote sensing applications in water resources engineering	3	0	0	3	60	40	100
3		Computational Hydraulics and Hydrology	3	0	0	3	60	40	100
4		Statistical Methods in Hydrology	3	0	0	3	60	40	100
5		Computational Hydraulics and Hydrology Laboratory	0	0	2	1	40	60	100
6		Water Resources Systems Design Lab	0	0	2	1	40	60	100
7		Seminar	0	0	2	1	00	100	100
		Total	**12**	**0**	**6**	**15**	**320**	**380**	**700**

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Third Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Geographical Information Systems and its Applications in Hydrology	3	0	0	3	60	40	100
2		Research Methodology & IPR	3	0	0	3	60	40	100
3		Department Electives-XIII	3	0	0	3	60	40	100
4		Department Electives-XIV	3	0	0	3	60	40	100
5		Department Electives-XV	3	0	0	3	60	40	100
6		Research Methodology & IPR Lab	0	0	2	1	40	60	100
7		Department Electives Lab-XIII	0	0	2	1	40	60	100
8		Department Electives Lab-XIV	0	0	2	1	40	60	100
9		Department Electives Lab-XV	0	0	2	1	40	60	100
10		Value Added Courses-II	2	0	0	2	60	40	100
		Total	**17**	0	**8**	**21**	520	480	1000

Fourth Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Dissertation	-	-	**20 W**	**20**	100	-	100
		Total	-	-	**20 W**	**20**	**100**	-	**100**

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Departmental Electives

S. No.	Specialization	Departmental Elective XIII	Departmental Elective XIV	Departmental Elective XV
1	Water Resource Engineering	Hydraulic Modeling 3-0-2 (4)	Hydrogeology and Groundwater Development 3-0-2 (4)	Environmental Impact Assessment of Water 3-0-2 (4)
2		Hydropower 3-0-2 (4)	Watershed Management 3-0-2 (4)	Urban Hydrology and Drainage 3-0-2 (4)

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Curriculum
(Scheme of Examination)
&
Syllabus for
M.Tech
Environmental Engineering

Batch 2021 onwards

SGT University Gurgaon

Credit Based Scheme w.e.f. 2021-2022

Scheme of Examination for M.Tech– Environmental Engineering Program

SEMESTER WISE COURSE STRUCTURE

First Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Atmospheric Processes & Climate Change	3	0	0	3	60	40	100
2		Physico-chemical, Biological Principles and Processes	3	0	0	3	60	40	100
3		Environmental Quality Modeling	3	0	0	3	60	40	100
4		Solid Waste Management	3	0	0	3	60	40	100
5		Environmental system design lab	0	0	2	1	40	60	100
6		Environmental Quality Modeling Lab	0	0	2	1	40	60	100
7		Value Added Courses-I	2	0	0	2	60	40	100
8		Seminar	0	0	2	1	00	100	100
		Total	**14**		**6**	**17**	**380**	**420**	**800**

Second Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Energy, Instrumentation, Measurement &Control	3	0	0	3	60	40	100
2		Environmental Audit & Impact Assessment	3	0	0	3	60	40	100
3		Design of Water & Wastewater Treatment Systems	3	0	0	3	60	40	100
4		Air Pollution & Its Control	3	0	0	3	60	40	100
5		Design of Water & Wastewater Treatment Systems Lab	0	0	2	1	40	60	100
6		Environmental Engineering Lab	0	0	2	1	40	60	100
7		Seminar	0	0	2	1	00	100	100
		Total	**12**	**0**	**6**	**15**	**320**	**380**	**700**

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Scheme of Examination for M.Tech– Environmental Engineering Program

SEMESTER WISE COURSE STRUCTURE

Third Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Energy Auditing, Conservation & Management	3	0	0	3	60	40	100
2		Research Methodology & IPR	3	0	0	3	60	40	100
3		Department Electives-XIII	3	0	0	3	60	40	100
4		Department Electives-XIV	3	0	0	3	60	40	100
5		Department Electives-XV	3	0	0	3	60	40	100
6		Research Methodology & IPR Lab	0	0	2	1	40	60	100
7		Department Electives Lab-XIII	0	0	2	1	40	60	100
8		Department Electives Lab-XIV	0	0	2	1	40	60	100
9		Department Electives Lab-XV	0	0	2	1	40	60	100
10		Value Added Courses-II	2	0	0	2	60	40	100
		Total	**17**	**-**	**8**	**21**	520	480	1000

Fourth Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Dissertation	0	0	20	20	100	0	100
		Total	**0**	**0**	**20**	**20**	100	0	100

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Departmental Elective

S. No.	Specialization	Departmental Elective XIII	Departmental Elective XIV	Departmental Elective XV
2	Environmental Engineering	Emerging Trends in Waste Treatment 3-0-2 (4)	Urban Environmental Quality Management 3-0-2 (4)	Environmental Quality Monitoring 3-0-2 (4)

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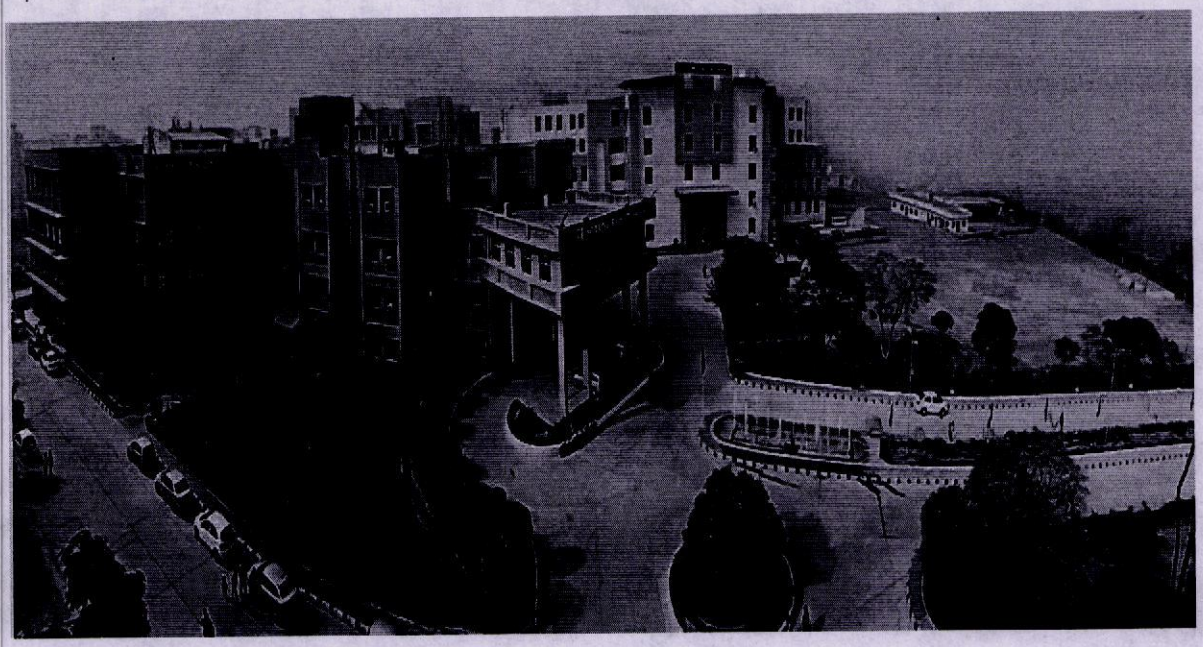
Department of Civil Engineering



M. Tech. **Structural Engineering**

Scheme & Syllabus (2021-22)

Vision of SGT University

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Structural Engineering
First Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Advance Pre-Stressed Concrete Design	3	0	0	3	60	40	100
2		Structural Dynamics	3	0	0	3	60	40	100
3		Matrix Methods of Structural Analysis	3	0	0	3	60	40	100
4		Design of Concrete Structural Systems	3	0	0	3	60	40	100
5		Matrix methods of Structural Analysis Lab (STAAD PRO)	0	0	2	1	40	60	100
6		Design of Concrete and Structural Systems Lab (STAAD PRO)	0	0	2	1	40	60	100
7		Value Added Courses-I	2	0	0	2	60	40	100
8		Seminar	0	0	2	1	00	100	100
		Total	**14**	**0**	**6**	**17**	**380**	**420**	**800**

Second Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Finite Element Analysis	3	0	0	3	60	40	100
2		Theory of Elasticity and Plasticity	3	0	0	3	60	40	100
3		Limit State Design of Steel Structures	3	0	0	3	60	40	100
4		Earthquake Resistant Design	3	0	0	3	60	40	100
5		Structural Engineering lab (CASTING)	0	0	2	1	40	60	100
6		Finite Element Analysis Lab (STAAD PRO)	0	0	2	1	40	60	100
7		Seminar	0	0	2	1	00	100	100
		Total	**12**	**0**	**6**	**15**	**320**	**380**	**700**

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Third Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Theory & Design of Plate and Shell	3	0	0	3	60	40	100
2		Research Methodology & IPR	3	0	0	3	60	40	100
3		Department Electives-XIII	3	0	0	3	60	40	100
4		Department Electives-XIV	3	0	0	3	60	40	100
5		Department Electives-XV	3	0	0	3	60	40	100
6		Research Methodology & IPR Lab	0	0	2	1	40	60	100
7		Department Electives Lab-XIII	0	0	2	1	40	60	100
8		Department Electives Lab-XIV	0	0	2	1	40	60	100
9		Department Electives Lab-XV	0	0	2	1	40	60	100
10		Value Added Courses-II	2	0	0	2	60	40	100
		Total	**17**	0	**8**	**21**	520	480	1000

Fourth Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Dissertation	-	-	**20 W**	**20**	100	-	100
		Total	-	-	**20 W**	**20**	**100**	-	**100**

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Departmental Electives

S. No.	Specialization	Departmental Elective XIII	Departmental Elective XIV	Departmental Elective XV
1	Structural Engineering	Pre-Fabricated Structures 3-0-2 (4) / Design of Industrial Structures 3-0-2 (4)	Maintenance & Rehabilitation of Structures 3-0-2 (4) / Design of Bridges 3-0-2 (4)	Composite Structures 3-0-2 (4) / Design of Tall Buildings 3-0-2 (4)

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Faculty of Engineering & Technology
Department of Civil Engineering

M. Tech. **Transportation Engineering**

Scheme & Syllabus (2021-22)

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Transportation Engineering
First Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1.		Pavement Materials	3	0	0	3	60	40	100
2.		Urban Transportation System Planning	3	0	0	3	60	40	100
3.		Geometric Design of Transportation Facilities	3	0	0	3	60	40	100
4.		Ground Improvement	3	0	0	3	60	40	100
5.		Pavement Materials Lab	0	0	2	1	40	60	100
6.		Geometric design Lab	0	0	2	1	40	60	100
7.		Value Added Courses-I	2	0	0	2	60	40	100
8.		Seminar	0	0	2	1	00	100	100
		Total	**14**	**0**	**6**	**17**	**380**	**420**	**800**

Second Semester

S. NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Analysis and Design of Pavement	3	0	0	3	60	40	100
2		Transport Economics	3	0	0	3	60	40	100
3		Traffic Engineering and Management	3	0	0	3	60	40	100
4		Airport Infrastructure, Planning and Design	3	0	0	3	60	40	100
5		Pavement Design Lab	0	0	2	1	40	60	100
6		Traffic Lab	0	0	2	1	40	60	100
7		Seminar	0	0	2	1	00	100	100
		Total	**12**	**0**	**6**	**15**	**320**	**380**	**700**

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Third Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Sustainable Built Environment	3	0	0	3	60	40	100
2		Research Methodology & IPR	3	0	0	3	60	40	100
3		Department Electives-XIII	3	0	0	3	60	40	100
4		Department Electives-XIV	3	0	0	3	60	40	100
5		Department Electives-XV	3	0	0	3	60	40	100
6		Research Methodology & IPR Lab	0	0	2	1	40	60	100
7		Department Electives Lab-XIII	0	0	2	1	40	60	100
8		Department Electives Lab-XIV	0	0	2	1	40	60	100
9		Department Electives Lab-XV	0	0	2	1	40	60	100
10		Value Added Courses-II	2	0	0	2	60	40	100
		Total	**17**	0	**8**	**21**	520	480	1000

Fourth Semester

S.NO.	Subject Code	Course Title	L	T	P	C	Examination marks		Subject Total
							Ext.	Int.	
1		Dissertation	0	0	**20 W**	**20**	100	0	100
		Total	0	0	**20 W**	**20**	**100**	0	**100**

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Departmental Electives

S. No.	Specialization	Departmental Elective XIII	Departmental Elective XIV	Departmental Elective XV
1	Transportation Engineering	Construction Project Management & BOT 3-0-2 (4)	Highway Construction Practices 3-0-2 (4)	Environment Impact Assessment 3-0-2 (4)
2		Intelligent Transportation Systems 3-0-2 (4)	Highway Traffic Analysis and Design 3-0-2 (4)	Bridge Engineering 3-0-2 (4)

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