

Finishing School Program (Online Internship)-May 2021

Name of Department	Department of Civil Engineering
Module Name	Matrix Analysis of Structures
Module Coordinators	Dr. Sanjay Tiwari & Dr. Pankaj Kumar
Module Objective	Nowadays almost all moderate size real life structures are analyzed using computers. The objective of this online internship is to develop an understanding of the basic principles of the matrix methods of structural analysis, so that they can be efficiently implemented on modern computers. For practical sessions student have to install trial version of required software e.g., MATLAB/STAAD all by themselves in case they do not have a licensed version.
Module Content	Review of Structural Analysis and Matrix Algebra, Basics of displacement method, member stiffness matrices for different type of structural members, Analysis of two-dimensional framed structures: Trusses, Beams, Frames Hands on Session on modelling, applying loads, defining supports and analysis using Software.
Module Methodology	The program will start with various aspects of structural analysis such as equilibrium, compatibility of deformation and constitutive laws, stiffness expressions and displacement method. Further, Various hands-on session is scheduled on freeware trial version of software used in structural analysis like STAAD/MATLAB.
Module Outcome/ Impact	<ul style="list-style-type: none">• Identify, formulate and solve engineering problems with stiffness matrices as applied to continuous beams, rigid frames and trusses.• Calculate deflections, reactions and internal forces for trusses, beams and frames using analytical and computer-based procedures• Be able to interpret computer output and validate results using hand calculations
Duration	3 Weeks (3 weeks @ 6days a week and 3-4 hrs. a day)

Finishing School Program (Online Internship)-2021

Day Wise Schedule				
	Date	Day	Module Contents to be covered /Interactive Session/Assignment/Quiz/Exercises/Daily practice sheets (DPP)/Tutorial/Project etc. (10:00 AM onward, 4-5 Hrs./ Day)	Faculty
Week 1	14/05/2021	Fri	Introduction to module: Review of Structural Analysis: Basic concepts of structural analysis: Equilibrium equations, compatibility conditions, Force displacement relations, Internal actions and end displacements,	Dr. Sanjay Tiwari
	15/05/2021	Sat	Introduction to stiffness and flexibility, Review of conventional methods, Introduction to matrices, Definition and types of matrices,	Dr. Sanjay Tiwari
Week 2	17/05/2021	Mon	Matrix operations, Solution of Simultaneous Equations: Gauss Jordan elimination method	Dr. Sanjay Tiwari
	18/05/2021	Tue	Introduction to MATLAB. Hands on Session on matrix operations in MATLAB-1	Dr. Sanjay Tiwari & Dr. Pankaj Kumar
	19/05/2021	Wed	Matrix operations in MATLAB Hands on Session Matrix operations in MATLAB-2	Dr. Sanjay Tiwari & Dr. Pankaj Kumar
	20/05/2021	Thu	Plane Trusses: Degree of freedom, Global and Local coordinate system	Dr. Sanjay Tiwari
	21/05/2021	Fri	Member stiffness relations in local and global coordinate system, Procedure for analysis of trusses	Dr. Sanjay Tiwari & Dr. Pankaj Kumar
	22/05/2021	Sat	Procedure for analysis of trusses	Dr. Sanjay Tiwari
Week 3	24/05/2021	Mon	Hands-on session – 3: on analysis of trusses using software: Input data and Interpretation of results	Dr. Sanjay Tiwari
	25/05/2021	Tue	Analysis of Beams: Degree of freedom, Member stiffness relations in local and global coordinate system, Procedure for analysis of beam	Dr. Sanjay Tiwari
	26/05/2021	Wed	Modelling of beams in softwares: Input data and result interpretations	Dr. Sanjay Tiwari & Dr. Pankaj Kumar
	27/05/2021	Thu	Hands-on session – 4: on analysis of beams using software: Input data and Interpretation of results	Dr. Sanjay Tiwari
	28/05/2021	Fri	Introduction to Plane Frame member, Member stiffness matrices for local and global coordinate system,	Dr. Sanjay Tiwari
	29/05/2021	Sat	Procedure for analysis of frames, Modelling of frames in softwares: Input data and result interpretations	Dr. Sanjay Tiwari & Dr. Pankaj Kumar

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	30/05/2021	Sun	Hands on Session-5: on analysis of plane frames using software: Input data and Interpretation of results. Concluding Remarks	Dr. Sanjay Tiwari & Dr. Pankaj Kumar
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Module Coordinators Email Id and Mobile Number	1) Dr. Sanjay Tiwari– stiwari.fce@mitsgwalior.in (9406587811) 2) Dr. Pankaj Kumar– pankaj437@mitsgwalior.in (9968270408)
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Eligibility and Important Instructions :-

1. The Online Finishing School Program (Online training/Internship) is designed only for Pre-final & Final Year students of Civil Engineering Department.
2. The student shall have some background of elementary matrix algebra and a keen interest in structural engineering with a prerequisite of at least one course in structural analysis at their prefinal level.
3. The students may apply online.
4. The Online Finishing School Program/ Summer Internship Program is free for the participants of Pre-final & Final year students of MITS, Gwalior.
5. The participants outside the Institute may also join the Program on payment basis.
6. This online module will be conducted under the Finishing School Program which will be considered equivalent to Online Internship of Pre-final year students who could not get any Internship during this situation.
7. Duration of this program will be of three weeks (3 weeks @ 6days a week and 3-4 hours a day) which is equivalent to summer Internship period as per AICTE and our Institute policy. Daily no. of hours of online training may be flexible.
8. Certificates will be issued to candidates who have attendance 75% or more and also score more than 60% in the test.

Finishing School Program (Online Internship)-2021

Name of Department	Department of Civil Engineering
Module Name	Environmental Engineering Design of Sewage Treatment Plant
Module Coordinators	1) Prof. Deepak Rastogi 2) Dr. Prachi Singh
Module Objective	Design of Sewage Treatment Plant is an important part of Civil Engineering field which effectively involves waste water treatment principles. The objective of this online internship is to give the basic idea about designing and functioning of conventional sewage treatment plant.
Module Content	Introduction of sewerage scheme. Characteristics of sewage. Treatment of sewage, Primary treatment, Secondary or Biological treatment, Tertiary treatment. Design of various treatment units i. e. Screening unit, Grit chamber, Primary settling tank. Design of biological treatment units i.e. Trickling filter, Activated Sludge Process, Oxidation Pond, Rotating biological contractor. Design of Tertiary treatment units like Removal of Phosphorus and Sulphur. Disinfection of sewage. Layout of sewage treatment plant and its economical design.
Module Methodology	The workshop will start with various aspects of sewage treatment plant design such as primary treatment units designing, design of biological treatment units and Tertiary treatment units design and their suitability aspect and economics.
Module Outcome/ Impact	<ul style="list-style-type: none">• Understand the design aspect of various treatment units used in the Sewage Treatment Plant.• Understand the various design requirements of Sewage manual• Understand the design methods of various treatment units.• Able to design and analyses the economy of the plant.
Duration	3 Weeks (16 days)

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Day Wise Schedule				
	Date	Day	Module Contents to be covered/Interactive Session/Assignment/Quiz/Exercises/Daily practice sheets (DPP)/Tutorial/Project etc. (10:00 AM onward, 2-3 Hrs./ Day)	Faculty
Week 1	14/05/2021	Fri	Introduction to sewerage scheme. Characteristics of Sewage	Prof. Deepak Rastogi
Week 2	17/05/2021	Mon	Quantity of Sewage estimation.	Dr. Prachi Singh
	18/05/2021	Tue	Various types of treatment units and their purpose	Dr. Prachi Singh
	19/05/2021	Wed	Design of primary treatment units (including grit chamber)	Prof. Deepak Rastogi
	20/05/2021	Thu	Design of Trickling filter	Dr. Prachi Singh
	21/05/2021	Fri	Design of Oxidation Pond	Prof. Deepak Rastogi
Week 3	24/05/2021	Mon	Design of Activated Sludge Process	Dr. Prachi Singh
	25/05/2021	Tue	Design of Rotating biological contractor	Dr. Prachi Singh
	26/05/2021	Wed	Tertiary treatment of sewage	Prof. Deepak Rastogi
	27/05/2021	Thu	Removal of Phosphorus and Sulphur from sewage	Dr. Prachi Singh
	28/05/2021	Fri	Finalization of design and drawings of Sewage Treatment Plant	Prof. Deepak Rastogi
	29/05/2021	Sat	Concluding Remarks by all Faculties	All Faculty

**Module Coordinators
Email Id and
Mobile Number**

- 1) Prof. Deepak Rastogi deepakrastogi@mitsgwalior.in (9826333895)
2) Dr. Prachi Singh, prachi@mitsgwalior.in (9425811509, 7905815624)

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5. This online module will be conducted under the Finishing School Program which will be considered equivalent to Online Internship of Pre-final year students who could not get any Internship during this situation.
6. Duration of this program will be of four weeks which is equivalent to summer Internship period as per AICTE and our Institute policy. Daily no. of hours of online training may be flexible.
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Finishing School Program (Online Internship)-2021

Name of Department	Department of Civil Engineering
Module Name	Field Outlook in Civil Engineering Projects
Module Faculty Coordinator	1. Dr. Pratibha Singh 2. Prof. Mohit Aggarwal
Pre requisite	Basic knowledge of Environmental Engineering Geotechnical properties of Soil and Foundations
Module Description	This internship is intended to impart knowledge about importance of field and lab testing on a construction site. It is designed to keep in mind the need of undergraduate students of Civil Engineering who have enthusiasm to learn the fundamental concepts of field practices in soil mechanics with the help of case studies. A special emphasis has been laid to elaborate points which are generally misunderstood and often causes errors during lab/field tests. Various approach to rectify those errors has also been discussed. A section is devoted to Ground improvement techniques for problematic construction sites. This training course shall cover both theoretical as well as practical aspects which will help students to see the practical side (actual site conditions) of Civil Engineering.
Module content	<ul style="list-style-type: none">❖ Field Tests on soils at a glance❖ Lab Tests on soils at a glance❖ Common problems faced during field/lab tests and their solutions❖ Causes of Errors in field and lab testing❖ Methods to rectify errors❖ Application of Lab/ Field Tests in various Geotechnical Engineering projects❖ Lab Tests on Rocks❖ Field Tests on Rocks❖ Common problems faced during field/lab tests and their solutions❖ Causes of Errors in field and lab testing❖ Methods to rectify errors❖ Application of Lab/ Field Tests in various Geotechnical Engineering projects

Module Outcome / Impact	Upon completion of the internship student will be able to:- 1) Understand the application of various soil and rock properties for different projects 2) Apply codal provisions in field 3) Identify the common causes of errors during field and lab tests 4) Evaluate the methods to reduce/ rectify errors at construction site 5) Understand different Ground improvement Techniques 6) Analyse various problems in construction site and provide suitable improvement technique 7) Understand the safety norms in field projects	
Module methodology	Online lectures supported by assignment, Virtual lab exercise and homework	
Duration	03 Weeks	
Day Wise Schedule		
	Date	Module contents to be covered
Week 1	14/05/2021 15/05/2021 17/05/2021	Laboratory Tests on soils 1. Moisture Content Determination 2. Grain Size Analysis 3. Liquid & Plastic Limit Tests. 4. Specific Gravity Tests. 5. Permeability Tests 6. Compaction Test. 7. Unconfined Compression Test. 8. Direct Shear Test. 9. Triaxial Shear Test 10. Consolidation test 11. Vane Shear Test
Week 2	18/05/2021 19/05/2021	Field Tests on soils 1. Field Density and Void ratio Tests 2. Standard penetration test 3. Static cone test 4. Permeability 5. Dynamic cone test 6. Plate Load Test 7. California Bearing 8. Vane Shear Test 9. Soil Investigation/ exploration
Week 2	20/05/2021 21/05/2021	Common problems faced during field/lab tests and their solutions ● Introduction to common problems faced during field and lab testing Important corrective measures to tackle common problems

Week 3	24/05/2021 to 30/05/2021	Lab Tests on Rocks 1. Preparation of rock sample for testing in laboratory. 2. Methods for determination of Compressive strength, Tensile strength, Shear strength and triaxial strength of rock. 3. Study and determination of Porosity of rock. 4. Study and determination of Abrasivity of rock. 5. Study of strength indices of rock. 6. Study of Modulus of elasticity and Poisson's ratio. 7. Study of Slake durability of rock. Field Tests on Rocks Determination of in situ stresses in rock. Introduction to common problems faced during field and lab testing Important corrective measures to tackle common problems
Module Coordinators Email Id and Mobile Number		Dr. Pratibha Singh, pratibhasinghcivil@mitsgwalior.in , 8077138901 Prof. Mohit Aggarwal, mohijvg@mitsgwalior.in , 8815923230

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Finishing School Program (Online Internship)-2021

Name of Department	Department of Civil Engineering
Module Name	Structural Design of a Two Storey RC Building
Module Coordinator	Dr. Hemant Shrivastava Dr. Pankaj Kumar Prof. Pranjul Rajput
Pre requisite	Knowledge of Design of Reinforcement Concrete Building Elements
Module Content	The module consists of concepts and theories involved in understanding the building plan and structural planning; estimation of design loads on different elements; design and analysis of different building elements and preparing design details.
Module Outcome/ Impact	Upon completion of the program, the student will be able to: 1) Understand various aspects of Structural Design 2) Apply recommendations of Indian Standard Codes for estimating Design loads. Design various elements for the estimated loads as per IS Code provisions
Duration	3 weeks

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Week	Date	Day	Module Contents to be covered/Interactive Session/Assignment/Quiz/Exercises/Daily practice sheets (DPP)/Tutorial/Project etc (10:00 AM onward, 1-2 Hrs/ Day)	Faculty
Week 1	14/05/2021	Fri	Understanding the building plan and its structural planning	Dr. Hemant Shrivastava Dr. Pankaj Kumar
	15/05/2021	Sat	Understanding the building plan and its structural planning	
Week 2	17/05/2021	Mon	Estimation of design loads on various elements	Prof. Pranjul Rajput
	18/05/2021	Tue	Estimation of design loads on various elements	
	19/05/2021	Wed	Analysis of different elements for estimated design loads	Dr. Hemant Shrivastava Dr. Pankaj Kumar Prof. Pranjul Rajput
	20/05/2021	Thu	Analysis of different elements for estimated design loads	
	21/05/2021	Fri	Analysis of different elements for estimated design loads	
	22/05/2021	Sat	Analysis of different elements for estimated design loads	
Week 3	24/05/2021	Mon	Designing the building elements for design variables	Prof. Pranjul Rajput
	25/05/2021	Tue	Designing the building elements for design variables	
	26/05/2021	Wed	Designing the building elements for design variables	Dr. Hemant Shrivastava Dr. Pankaj Kumar Prof. Pranjul Rajput
	27/05/2021	Thu	Designing the building elements for design variables	
	28/05/2021	Fri	Designing the building elements for design variables	
	29/05/2021	Sat	Designing the building elements for design variables	
	30/05/2021	Sun	Preparing design details	

Details	<p>Total Lectures + Practical sessions = 20 hours</p> <p>Total hours of home assignment = 5 hours</p> <p>Total number of hours = 25</p>
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Module Coordinator Email Id and Mobile Number	<p>Dr. Hemant Shrivastava Assistant Professor E-Mail: hemantshrivastava1986@mitsgwalior.in Mob: 9540308139</p> <p>Dr. Pankaj Kumar Assistant Professor Email: pankaj437@mitsgwalior.in Mob: 9968270408</p> <p>Prof. Pranjul Rajput Assistant Professor Email: pranjulr@mitsgwalior.in Mob: 8517984828</p>
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2. This online module will be conducted under the Finishing School Program which will be considered equivalent to Online Internship of Pre-final year students who could not get any Internship during this situation.
3. There is no fee for the participants of Pre-final & Final year students of MITS, Gwalior.
4. The participants outside the Institute may also join the Program on payment basis.
5. Duration of this program will be of two weeks which is equivalent to summer Internship period as per AICTE and our Institute policy. Daily no. of hours of online training may be flexible.
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