

### Department of Mathematics

## Lesson Plan

## Session: 2021-2022(Odd Semester)

Program:M.Sc	Semester:3rd
Name of the Course:Mathematical Methods	Course Code:MSM 303
Name of the Faculty: Dr. Ranjan Kalita	

#### **Details Plan**

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Laplace transform	15	5 <sup>th</sup> Oct-25 <sup>th</sup> Oct	White board, Smart board, Projector	Test-I	
2	Fourier transform	15	27 <sup>th</sup> Oct -15 <sup>th</sup> Nov	White board, Smart board, Projector		
3	Fradholm Integral equation	15	16 <sup>th</sup> Nov-1 <sup>st</sup> Dec	White board, Smart board, Projector	Test-II	
4	Volterra Integral equation	15	2 <sup>nd</sup> Dec-15 <sup>th</sup> Dec	White board, Smart board, Projector		
5	Milne transform and hankel transform	15	16 <sup>th</sup> Dec-1 <sup>st</sup> Jan	White board, Smart board, Projector	Test-III	

### Suggested Books/Reference Books:

- 1. R. P. Kanwal, Linear integral equations, theory and techniques, academic press, New York.
- 2. Francis B, Methods of Applied Mathematics, Hilerbrand, Prentice Hall of India.
- 3. R. Conrant & D. Hilbert, Methods of Mathematical Physics- Vol 1, Wiley Inter-science, New York, 1953.
- 4. M. D. Raisinghania, Integral transforms and boundary value problems, S Chand

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## **Department of Mathematics**

## Lesson Plan

## Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester:III

Name of the Course:Number Theory.CourseCode:MSM 301

Name of the Faculty: Dr. Pinkimani Goswami

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit 1	Well ordering principle, Archimedean property, Division Algorithm	2	6/10/21-30/10/21	Green board, projector, smart classroom, USTM LMS portal	Test-I (Unit 1& a part of Unit 2)	Homework & Assignment will be given to improve problem solving skill.
	Divisibility and Devisor function	2		_		
£	Greatest common divisor, least common multiple, Euclidean algorithm	4				
	Prime numbers, factorization in prime numbers, fundamental theorem of arithmetic	5			2	
*	Perfect numbers, Mersennenumb ers, Fermat numbers	2		39	·	
Unit 2	Concept of congruence and properties	3	30/10/21 – 15/11/21			Homework & Assignment will be given to improve problem solving skill.

	residue classes and reduced	2				15	
	residue classes  Euler-Fermat's Theorem. Wilson's Theorem	3					
	linear congruence, Chinese Remainder Theorem,	5		к. =			
	polynomial congruence.	2			((4)		
Unit 5	Primitive roots, indices, order, necessary and sufficient condition for the existence of primitive roots, primitive roots for prime.	15	16/11/21 – 30/12/21			Test-II (Remaining part of Unit 2 & Unit 3)	Homework & Assignment will be given to improve problem solving skill.
Unit 4		2	30/12/21- 15/01/22				Homework & Assignment will be
	Legendre's symbol, Euler's Criterion, Gauss' Lemma	3	,				given to improve problem solving skill.
148	Quadratic reciprocity Law, Jacobi symbol,	5					
	quadratic congruence of second degree with prime modulus and with composite modulus.	5		17		,	
Unit 5	Fibonacci numbers, the Fibonacci sequences, certain identities		16/01/22- 23/01/22			Test-III (Unit 4 & 5)	Homework & Assignment will be given to improve problem solving skill.
	involving Fibonacci						

	numbers				140
	Continued			) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	<del> </del>
	fractions,				
	simple				
	continued	3			
	fractions,				
	approximation	W.			
	of irrational				
	numbers by				1
	continued				
Í	fractions			Yı	
	Pell's equation				

1.D.M. Burton, Elementary Number Theory, McGraw-Hill Education, 2014.

2.Niven& Zuckerman, An Introduction to the Theory of Numbers, Wiley Edition, 1999.

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HOD Department of Mathematics University of Science & Technology, Meghalaya

Signature of the Faculty



## **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. P.

Semester: 1st

Name of the Course: Remedial Mathematics

Course Code: BP106RMT

Name of the Faculty: Dr. Kangkan Choudhury

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Partial Fraction, Logarithms, Function, Limits and continuity	06	09-10-2021 to 05- 11-2021	White board, smartboard, projector	Test-I	
2	Matrices and Determinant	06	06-11-2021 to 25- 11-2021	White board, smartboard, projector	Unit 1 and Unit 2	
3	Calculus	06	26-11-2021 to 16- 12-2021	White board, smartboard, projector		ti .
4	Analytical Geometry	06	17-12-2021 to 06- 01-2022	White board, smartboard, projector	Test-II	
5	Differential Equations, Laplace transform	06	07-01-2022 to 29- 01-2022	White board, smartboard, projector	Unit 3 and Unit 4	
					*	
				ti ti	Test-III	
		170			Unit 5	

Suggested Books/Reference Books:

1. Higher Engineering Mathematics by Dr. B. S. Grewal

2. Mathematics by Dr. R. D. Sharma

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## **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester: 3<sup>rd</sup>

Name of the Course: Classical Algebra

Course Code: BSM 731

Name of the Faculty: Dr. Kangkan Choudhury

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Inequalities	10	20-09-2021 to 10- 10-2021	Whiteboard, smartboard, projector	Test-I	
2	Relation between roots and coefficients	15	11-10-2021 to 10- 11-2021	Whiteboard, smartboard, projector	Unit 1 and Unit 2	
3	Matrices	10	11-11-2021 to 28- 11-2021	Whiteboard, smartboard, projector		
4	Trigonometry	15	29-11-2021 to 10- 01-2022	Whiteboard, smartboard, projector		
	9				Test-II	
					Unit 3	
					Test-III	
					Unit 4	

Suggested Books/Reference Books:

I. Higher Algebra by S. K. Mappa

<sup>2.</sup> Higher Engineering Mathematics, H.K. Dass

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### **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M. Sc.

Semester: 3<sup>rd</sup>

Name of the Course: Hydrodynamics

Course Code: MSM 304

Name of the Faculty: Dr. Kangkan Choudhury

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
4	Kinematics of fluid motion	15	07-10-2021 to 25- 11-2021	Whiteboard, smartboard, projector	Test-I	
5	Motion in plane	15	29-11-2021 to 20- 12-2021	Whiteboard, smartboard, projector	Unit 4	
6	Motion in space	15	23-12-2021 to 24- 01-2022	Whiteboard, smartboard, projector		
					Test-II	
					Unit 5	
					Test-III	
					Unit 6	

#### Suggested Books/Reference Books:

- 1. Hydrodynamics, S Chand, M. D. Raisinghania
- 2. Hydrodynamics, Horace Lamb, Cambridge University Press

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#### **Department of Mathematics**

## Lesson Plan

#### Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester:3<sup>rd</sup>

Name of the Course: Vector Analysis

CourseCode:BSM 732

Name of the Faculty: Dr. AnupamDutta

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Scalar Triple product, vector triple product, product of four vectors	8	30-09-2021 to 30- 10-2021	Whiteboard, smart board, projector	Test-I	
2	Vector point function, vector differentiation, curl, grade, divergence and identities	15	01-11-2021 to 20- 12-2021	Whiteboard, smart board, projector	Unit 1	
					Total II	
					Test-II	
					Vector point	
					function,	
			<b></b>		Vector differentiatio	
-						
					n	
7-					Test-III	
-	-				Curl,	
-					divergence,	
					gradient	
					1	

#### Suggested Books/Reference Books:

- 1. Engineering Mathematics by H. K. Dass
- 2. Vector analysis, Schuum outline

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## Department of Mathematics

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester:III

Name of the Course: Continuum Mechanics.

CourseCode:MSM 304

Name of the Faculty: Dr. AnupamDutta

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional	Remarks
1	Tensor Calculus	5	5/10- 20/10	White board	Test-I	
	Triple product vectors	1	21/10-25/10	White board	Unit-I	
	Analysis of Stress, Equation of Equilibrium.	10	26/10-25/11	White board, Power point Presentation		
2				Fresentation		
3	Analysis of Strain,	5	26/11- 2/12	White board	Test-II	
	Lagrangian And Eularian Description of Deformation Tensor, Cauchy Principle			**************************************	Unit -	
	DEFORMATION TENSORCAUCHY PRINCIPLE	5	3/12- 15/12	White board		
	EQUATION OF INVARIANTS, SPERICAL AND DERIATOR STARIN COMPONENTS	5	16/12- 29/12	White board, Power point Presentation	4	
	Constitutive Equation of Continuum Mechanics, Linear elasticity,	5	31/12/2021- 10/01/2022	White board	Test-III Unit III	

	Electronegative	10	11/01/2022-	White board	
	Problems of Fluids, Viscous stress tensor, Barotropic Flow		15/01/2022		
	Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's	05	16/01/2022- 25/01/2022	White board and Power point Presentation	
_	Equation				

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2 M D Raishinania, Hydrodynamics, S Chand

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## Science & Technology Meghalaya

### **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester: III

Name of the Course: Operation Research.

Course Code:MSM 305

Name of the Faculty: Dr. AnupamDutta

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Basics and History of Operation Research	5	5/10- 20/10	White board, Smart Board	Test-I Unit-I	
	Phase of OR Models, Classifications of OR	1 10	21/10-25/10 26/10-25/11	White board White board, Smart Board		
2	Linear programming Assumptions of	5	26/11- 2/12 3/12- 15/12	White board, Smart Board White board	Test-II Unit - II	
i.e	Examples of LPP	5	16/12- 29/12	White board, Power point Presentation		
3	Transportation Problems, Assignment Problems	5	31/12/2021- 10/01/2022	White board, Smart Board	Test-III Unit III	
	Simulation, Queuing Models	05	11/01/2022- 15/01/2022	White board		·
	Non Linear programming, Quadratic Programming	05	16/01/2022- 25/01/2022	White board and Power point Presentation		

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- 2.Er. Prem Kumar Gupta & Dr. D. S. Hira, S Chand

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#### **Department of Mathematics**

### Lesson Plan

## Session: 2021-2022(Odd Semester)

Program:M.Sc.	Semester:3rd
Name of the Course: Mathematical Methods	Course Code:MSM 303
Name of the Faculty: Dr. Ranjan Kalita	

#### **Details Plan**

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Laplace transform	15	5 <sup>th</sup> Oct-25 <sup>th</sup> Oct	White board, Smart board, Projector	Test-I	
2	Fourier transform	15	27 <sup>th</sup> Oct -15 <sup>th</sup> Nov	White board, Smart board, Projector		
3	Fradholm Integral equation	15	16 <sup>th</sup> Nov-1 <sup>st</sup> Dec	White board, Smart board, Projector	Test-II	
4	Volterra Integral equation	15	2 <sup>nd</sup> Dec-15 <sup>th</sup> Dec	White board, Smart board, Projector	¥	
5	Milne transform and hankel transform	15	16 <sup>th</sup> Dec-1 <sup>st</sup> Jan	White board, Smart board, Projector	Test-III	

Suggested Books/Reference Books:

R. P. Kanwal, Linear integral equations, theory and techniques, academic press, New York.

Francis B, Methods of Applied Mathematics, Hilerbrand, Prentice Hall of India.

R. Conrant & D. Hilbert, Methods of Mathematical Physics- Vol 1, Wiley Inter-science, New York, 1953.

M. D. Raisinghania, Integral transforms and boundary value problems, S Chand

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### **Department of Mathematics**

## Lesson Plan

#### Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester:III

Name of the Course:Number Theory.CourseCode:MSM 301

Name of the Faculty: Dr. Pinkimani Goswami

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
Unit 1	Well ordering principle, Archimedean property, Division Algorithm	2	6/10/21-30/10/21	Green board, projector, smart classroom, USTM LMS portal	Test-I (Unit 1& a part of Unit 2)	Homework & Assignment will be given to improve problem solving skill.
	Divisibility and Devisor function	2				
	Greatest common divisor, least common multiple, Euclidean algorithm	4		12	· · · ·	
	Prime numbers, factorization in prime numbers, fundamental theorem of arithmetic	5		a.	241	
₹A	Perfect numbers, Mersennenumb ers, Fermat numbers	2	,			
Unit 2	Concept of congruence and properties	3	30/10/21 – 15/11/21			Homework & Assignment will be given to improve problem solving skill.

		residue classes	2					
		and reduced						
		residue classes			*			
		Euler-Fermat's Theorem. Wilson's Theorem	3	780				
		linear congruence, Chinese Remainder Theorem,	5		* = -			
7		polynomial congruence.	2			38	4	
	Unit 3	Primitive roots, indices, order, necessary and sufficient condition for the existence of primitive roots, primitive roots for prime.	15	16/11/21 – 30/12/21	ī	# # # # # # # # # # # # # # # # # # #	Test-II (Remaining part of Unit 2 & Unit 3)	Homework & Assignment will be given to improve problem solving skill.
	Unit 4	Quadratic residues	2	30/12/21- 15/01/22				Homework & Assignment will be
		Legendre's symbol, Euler's Criterion, Gauss' Lemma	3				7	given to improve problem solving skill.
		Quadratic reciprocity Law, Jacobi symbol,	5					*
		quadratic congruence of second degree with prime modulus and with composite modulus.	5		are a			
Ŀ	- 1	Fibonacci numbers, the Fibonacci sequences, certain identities		16/01/22- 23/01/22			Test-III (Unit 4 & 5)	Homework & Assignment will be given to improve problem solving skill.
		involving Fibonacci					·	

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numbers		
Continued fractions, simple	OF:	
continued fractions,		
approximation of irrational numbers by		
fractions Pell's equation		

1.D.M. Burton, Elementary Number Theory, McGraw-Hill Education, 2014.

2.Niven& Zuckerman, An Introduction to the Theory of Numbers, Wiley Edition, 1999.

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HOD Department of Mathematics
HOD Department of Mathematics
Technology,
Meghalaya
University of Meghalaya

Signature of the Faculty



## Department of Mathematics

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. P.

Semester: 1st

Name of the Course: Remedial Mathematics

Course Code: BP106RMT

Name of the Faculty: Dr. Kangkan Choudhury

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Partial Fraction, Logarithms, Function, Limits and continuity	06	09-10-2021 to 05- 11-2021	White board, smartboard, projector	Test-I	
2			1		Unit 1 and	
2	Matrices and Determinant	06	06-11-2021 to 25- 11-2021	White board, smartboard, projector	Unit 2	
3	Calculus	06	26-11-2021 to 16- 12-2021	White board, smartboard, projector	\$-	
4	Analytical	06	17 12 2021 1 26			
	Geometry	00	17-12-2021 to 06- 01-2022	White board, smartboard, projector	Test-II	
5	Diff				Unit 3 and	
<b>.</b>	Differential Equations, Laplace transform	06	07-01-2022 to 29- 01-2022	White board, smartboard, projector	Unit 4	
-						
					Test-III	
			1		Unit 5	
		-				

1. Higher Engineering Mathematics by Dr. B. S. Grewal

2. Mathematics by Dr. R. D. Sharma

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## **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester: 3<sup>rd</sup>

Name of the Course: Classical Algebra

Course Code: BSM 731

Name of the Faculty: Dr. Kangkan Choudhury

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Inequalities	10	20-09-2021 to 10- 10-2021	Whiteboard, smartboard, projector	Test-I	
2	Relation between roots and coefficients	15	11-10-2021 to 10- 11-2021	Whiteboard, smartboard, projector	Unit 1 and Unit 2	
3	Matrices	10	11-11-2021 to 28- 11-2021	Whiteboard, smartboard, projector		
4	Trigonometry	15	29-11-2021 to 10- 01-2022	Whiteboard, smartboard, projector		(4)
			74		Test-II	
11915					Unit 3	
					Test-III	
					Unit 4	

Suggested Books/Reference Books:

2. Higher Engineering Mathematics, H.K. Dass

<sup>1.</sup> Higher Algebra by S. K. Mappa

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### **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M. Sc.

Semester: 3<sup>rd</sup>

Name of the Course: Hydrodynamics

Course Code: MSM 304

Name of the Faculty: Dr. Kangkan Choudhury

#### **Details Plan**

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
4	Kinematics of fluid motion	15	07-10-2021 to 25- 11-2021	Whiteboard, smartboard, projector	Test-I	
5	Motion in plane	15	29-11-2021 to 20- 12-2021	Whiteboard, smartboard, projector	Unit 4	
6	Motion in space	15	23-12-2021 to 24- 01-2022	Whiteboard, smartboard, projector		
					Test-II	
					Unit 5	
				16	Test-III	
					Unit 6	

Suggested Books/Reference Books:

2. Hydrodynamics, Horace Lamb, Cambridge University Press

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#### **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester:3<sup>rd</sup>

Name of the Course: Vector Analysis

CourseCode:BSM 732

Name of the Faculty: Dr. AnupamDutta

#### Details Plan

Scalar Triple product, vector triple product,	8	(DoC-DoE)		Test	
product of four vectors		30-09-2021 to 30- 10-2021	Whiteboard, smart board, projector	Test-I	
Vector point function, vector differentiation, curl, grade, divergence and identities	15	01-11-2021 to 20- 12-2021	Whiteboard, smart board, projector	Unit 1	:ec:
	4			Took II	
<del></del>					
100					
				gradient	
	Vector point function, vector differentiation, curl, grade, divergence and	Vector point 15 function, vector differentiation, curl, grade, divergence and	Vector point function, vector differentiation, curl, grade, divergence and	Vector point function, vector differentiation, curl, grade, divergence and 15 01-11-2021 to 20- Whiteboard, smart board, projector	Vector point function, vector differentiation, curl, grade, divergence and

#### Suggested Books/Reference Books:

- 1. Engineering Mathematics by H. K. Dass
- 2. Vector analysis, Schuum outline

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### **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester:III

Name of the Course: Continuum Mechanics.

CourseCode:MSM 304

Name of the Faculty: Dr. AnupamDutta

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Tensor Calculus	5	5/10- 20/10	White board	Test-I	
	Triple product vectors	1	21/10-25/10	White board	Unit-I	
	Analysis of Stress, Equation of Equilibrium.	10	26/10-25/11	White board, Power point Presentation		2:
2				resentation		
3	Analysis of Strain,	5	26/11- 2/12	White board		
	Lagrangian And Eularian Description of Deformation Tensor, Cauchy Principle		25,11 2,12	writte board	Test-II Unit - II	
	DEFORMATION TENSORCAUCHY PRINCIPLE	5	3/12- 15/12	White board		
	EQUATION OF INVARIANTS, SPERICAL AND DERIATOR STARIN COMPONENTS	5	16/12- 29/12	White board, Power point Presentation		
	Constitutive Equation of Continuum Mechanics, Linear elasticity,	5	31/12/2021- 10/01/2022	White board	Test-III Unit III	8

Electronegative	10	11/01/2022-	White board		
Problems of Fluids, Viscous stress tensor, Barotropic Flow		15/01/2022			
Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's	05	16/01/2022- 25/01/2022	White board and Power point Presentation	**	
Equation					
	Problems of Fluids, Viscous stress tensor, Barotropic Flow Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's	Electronegative Problems of Fluids, Viscous stress tensor, Barotropic Flow Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's	Electronegative 10 11/01/2022- Problems of Fluids, Viscous stress tensor, Barotropic Flow Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's	Electronegative 10 11/01/2022- White board  Problems of Fluids, Viscous stress tensor, Barotropic Flow  Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's White board and Power point Presentation	Electronegative 10 11/01/2022- White board  Problems of Fluids, Viscous stress tensor, Barotropic Flow  Newtonian Fluid, Naviour Stokes equations, Irrotational Flow, Bernoulli's White board and Power point Presentation

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2M D Raishinania, Hydrodynamics, S Chand

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## Science & Technology Meghalaya

### **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester: III

Name of the Course: Operation Research.

Course Code: MSM 305

Name of the Faculty: Dr. AnupamDutta

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Basics and History of Operation Research	5	5/10- 20/10	White board, Smart Board	Test-I Unit-I	
	Phase of OR Models, Classifications of OR	1 10	21/10-25/10 26/10-25/11	White board White board, Smart Board		
2	Linear programming	5	26/11- 2/12	White board, Smart Board	Test-II Unit - II	-
	Assumptions of LPP	5	3/12- 15/12	White board	O(IIC - II	
	Examples of LPP	5	16/12- 29/12	White board, Power point Presentation	ts .	
3	Transportation Problems, Assignment Problems	5	31/12/2021- 10/01/2022	White board, Smart Board	Test-III Unit III	
	Simulation, Queuing Models	05	11/01/2022- 15/01/2022	White board		
	Non Linear programming, Quadratic Programming	05	16/01/2022- 25/01/2022	White board and Power point Presentation		


1.,KantiSwarup& P K Gupta & Man Mohan by Sultan Chand & Sons

2.Er. Prem Kumar Gupta & Dr. D. S. Hira, S Chand

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## **Department of Mathematics**

### Lesson Plan

## Session: 2021-2022(Odd Semester)

Program:M.Sc	Semester:3rd
Name of the Course: Mathematical Methods	Course Code:MSM 303
Name of the Faculty: Dr. Ranjan Kalita	B =

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional	Remarks
1	Laplace transform	15	5 <sup>th</sup> Oct-25 <sup>th</sup> Oct	White board, Smart board, Projector	Test Test-I	
2	Fourier transform	15	27 <sup>th</sup> Oct -15 <sup>th</sup> Nov	White board, Smart board, Projector		
3	Fradholm Integral equation	15	16 <sup>th</sup> Nov-1 <sup>st</sup> Dec	White board, Smart board, Projector	Test-II	
4	Volterra Integral equation	15	2 <sup>nd</sup> Dec-15 <sup>th</sup> Dec	White board, Smart board, Projector	*	
5	Milne transform and hankel transform	15	16 <sup>th</sup> Dec-1 <sup>st</sup> Jan	White board, Smart board, Projector	Test-III	

#### Suggested Books/Reference Books:

- R. P. Kanwal, Linear integral equations, theory and techniques, academic press, New York.
- 2. Francis B, Methods of Applied Mathematics, Hilerbrand, Prentice Hall of India.
- R. Conrant & D. Hilbert, Methods of Mathematical Physics- Vol 1, Wiley Inter-science, New York, 1953.
- M. D. Raisinghania, Integral transforms and boundary value problems, S Chand

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## **Department of Mathematics**

## Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester:III

Name of the Course:Number Theory.CourseCode:MSM 301

Name of the Faculty: Dr. Pinkimani Goswami

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional	Remarks
Unit :	principle, Archimedean property, Division Algorithm	2	6/10/21-30/10/21	Green board, projector, smart classroom, USTM LMS portal	Test-I (Unit 1& a part of Unit 2)	
	Divisibility and Devisor function	2			16	
	Greatest common divisor, least common multiple, Euclidean algorithm	4			8) (4)	>
	Prime numbers, factorization in prime numbers, fundamental theorem of arithmetic	5		car.		
	Perfect numbers, Mersennenumb ers, Fermat numbers	2				
it 2	Concept of congruence and properties	3	30/10/21 – 15/11/21		8	Homework & Assignment will be given to improve problem solving skill.

8		residue classes and reduced residue classes			÷			
		Euler-Fermat's Theorem. Wilson's Theorem	3	1=			-	
		linear congruence, Chinese Remainder Theorem,	5		э	W = -		
		polynomial congruence.	2			:=		_
Ui	nit 3	Primitive roots, indices, order, necessary and sufficient condition for the existence of primitive roots, primitive roots	15	16/11/21 – 30/12/21			Test-II (Remaining part of Uni & Unit 3)	
Uni	it 4	for prime.  Quadratic residues	2	30/12/21-			-	Homework &
		Legendre's symbol, Euler's Criterion, Gauss' Lemma	3	15/01/22	G#			Assignment will be given to improve problem solving skill.
i de	1	Quadratic reciprocity Law, Jacobi symbol,	5				9	
	s v n	quadratic congruence of second degree with prime nodulus and with composite nodulus.	5		¥			-
Unit 5	n F se ce	ibonacci umbers, the ibonacci equences, ertain lentities		16/01/22- 23/01/22			Test-III (Unit 4 & 5)	Homework & Assignment will be given to improve problem solving skill.
		volving ibonacci			(6)		Y <sub>se</sub>	

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numbers					
Continued		×			
fractions,					
simple					
continued					
fractions,					
approximation of irrational					
numbers by	4				
continued			1	4	
fractions					
Pell's equation					

I.D.M. Burton, Elementary Number Theory, McGraw-Hill Education, 2014.

2. Niven & Zuckerman, An Introduction to the Theory of Numbers, Wiley Edition, 1999.

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#### Department of Mathematics

#### Lesson Plan

#### Session: 2021-2022(Odd Semester)

Program: B. P.

Semester: 1st

Name of the Course: Remedial Mathematics

Course Code: BP106RMT

Name of the Faculty: Dr. Kangkan Choudhury

			2 CHAIN TIME	4		
Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	for Sessional	Remarks
1	Partial Fraction, Logarithms, Function, Limits and continuity	06	09-10-2021 to 05- 11-2021	White board, smartboard, projector	Test Test-I	
2	Matrices and Determinant	06	06-11-2021 to 25- 11-2021	White board, smartboard, projector	Unit 1 and Unit 2	
3	Calculus	06	26-11-2021 to 16- 12-2021	White board, smartboard, projector		
4	Analytical Geometry	06	17-12-2021 to 06- 01-2022	White board, smartboard, projector	Test-II	
	Differential Equations, Laplace transform	06	07-01-2022 to 29- 01-2022	White board, smartboard, projector	Unit 3 and Unit 4	
					Test-III Unit 5	

1. Higher Engineering Mathematics by Dr. B. S. Grewal

2. Mathematics by Dr. R. D. Sharma

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#### **Department of Mathematics**

#### Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester: 3<sup>rd</sup>

Name of the Course: Classical Algebra

Course Code: BSM 731

Name of the Faculty: Dr. Kangkan Choudhury

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	for Sessional	Remarks
1	Inequalities	10	20-09-2021 to 10- 10-2021	Whiteboard, smartboard, projector	Test Test-I	
2	Relation between roots and coefficients	15	11-10-2021 to 10- 11-2021	Whiteboard, smartboard, projector	Unit 1 and Unit 2	
3	Matrices	10	11-11-2021 to 28- 11-2021	Whiteboard, smartboard, projector		
4	Trigonometry	15	29-11-2021 to 10- 01-2022	Whiteboard, smartboard, projector		
					Took II	
					Test-II Unit 3	
		34	,			
					Test-III	
					Unit 4	

Suggested Books/Reference Books:

<sup>1.</sup> Higher Algebra by S. K. Mappa

<sup>2.</sup> Higher Engineering Mathematics, H.K. Dass

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#### Department of Mathematics

#### Lesson Plan

#### Session: 2021-2022(Odd Semester)

Program: M. Sc.

Semester: 3<sup>rd</sup>

Name of the Course: Hydrodynamics

Course Code: MSM 304

Name of the Faculty: Dr. Kangkan Choudhury

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional	Remarks
4	Kinematics of fluid motion	15	07-10-2021 to 25- 11-2021	Whiteboard, smartboard, projector	Test Test-I	
5	Motion in plane	15	29-11-2021 to 20- 12-2021	Whiteboard, smartboard, projector	Unit 4	1
6	Motion in space	15	23-12-2021 to 24- 01-2022	Whiteboard, smartboard, projector		×
					Test-II	
					Unit 5	
					Test-III	
					Unit 6	

Suggested Books/Reference Books:

1. Hydrodynamies, S Chand, M. D. Raisinghania

2. Hydrodynamies, Horace Lamb, Cambridge University Press

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#### **Department of Mathematics**

#### Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester:3<sup>rd</sup>

Name of the Course: Vector Analysis

CourseCode:BSM 732

Name of the Faculty: Dr. AnupamDutta

#### Details Plan

Unit	Topic	Targeted No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Scalar Triple product, vector triple product, product of four vectors	8	30-09-2021 to 30- 10-2021	Whiteboard, smart board, projector	Test-I	
2	Vector point function, vector differentiation, curl, grade, divergence and identities	15	01-11-2021 to 20- 12-2021	Whiteboard, smart board, projector	Unit 1	
			*	•	Test-II	*
					Vector point function, Vector differentiatio	
					Test-III	
				`	Curl, divergence, gradient	

Suggested Books/Reference Books:

- I. Engineering Mathematics by H. K. Dass
- 2. Vector analysis, Schuum outline

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#### **Department of Mathematics**

#### Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester:III

Name of the Course: Continuum Mechanics.

CourseCode:MSM 304

Name of the Faculty: Dr. AnupamDutta

Unit	Topic	No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	for Sessional	Remarks
1	Tensor Calculus	5	5/10-20/10	White board	Test	
	Triple product vectors	1	21/10-25/10	White board	Test-I Unit-I	
	Analysis of Stress, Equation of Equilibrium.	10	26/10-25/11	White board, Power point Presentation		
2				310	-	
3						· · · · · · · · · · · · · · · · · · ·
3	Analysis of Strain, Lagrangian And Eularian Description of Deformation	5	26/11- 2/12	White board	Test-II Unit - II	
	Tensor, Cauchy Principle	(4€)		14 E		
	DEFORMATION TENSORCAUCHY PRINCIPLE	5	3/12- 15/12	White board		
	EQUATION OF INVARIANTS , SPERICAL AND DERIATOR STARIN COMPONENTS	5	16/12- 29/12	White board, Power point Presentation		
		5	31/12/2021-	White board	Test-III	
	Equation of Continuum Mechanics, Linear elasticity,	8	10/01/2022	Time Sould	Unit III	

Irrotational Flow, Bernoulli's Equation			Presentation	
Newtonian Fluid, Naviour Stokes equations,	05	16/01/2022- 25/01/2022	White board and Power point	
Electronegative Problems of Fluids, Viscous stress tensor, Barotropic Flow	10	11/01/2022- 15/01/2022	White board	

Suggested Books/Reference Books:

1.G E Mase, continuum Machanics, Mc Grow hills

2.M D Raishinania, Hydrodynamics, S Chand

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#### **Department of Mathematics**

#### Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M.Sc.

Semester: III

Name of the Course: Operation Research.

Course Code:MSM 305

Name of the Faculty: Dr. AnupamDutta

	it Topic	No. of classes	Tentative Schedule Unit wise (DoC-DoE)	Tentative Pedagogy	for Sessional	Remarks
1	Basics and History of Operation Research	5	5/10- 20/10	White board, Smart Board	Test Test-I Unit-I	
	Phase of OR	1	21/10-25/10	White board		
(30)	Models, Classifications of OR	10	26/10-25/11	White board, Smart Board		
2	Linear programming	5	26/11-2/12	White board, Smart Board	Test-II Unit - II	
	Assumptions of LPP	5	3/12- 15/12	White board	oint-#	
-	Examples of LPP	5	16/12- 29/12	White board, Power point Presentation		
	Transportation Problems, Assignment Problems	5	31/12/2021- 10/01/2022	White board, Smart Board	Test-III Unit III	
×	Simulation, Queuing Models	05	11/01/2022- 15/01/2022	White board		
	Non Linear programming, Quadratic Programming	05	16/01/2022- 25/01/2022	White board and Power point Presentation		

Suggested Books/Reference Books:

- i.,KantiSwarup& P K Gupta & Man Mohan by Sultan Chand & Sons
- 2.Er. Prem Kumar Gupta & Dr. D. S. Hira, S Chand

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# Department of Mathematics

## Lesson Plan

Session: 2021-2022(Odd Semester)

Pregram: M.Sc.

Name of the Course: Real Analysis

Name of the Faculty: Dr. Prabin Das

Semester: 1st

Course Code: MSM 101

Ы	-	_
Limits and Continuity  a. Limit and continuity in metric spaces – 4 days b. Uniform continuity and Lipschitz con. fn. – 3 days  c. Banach's contraction mapping principle and Intermediate Value Theorem – 4 days	<ul> <li>a. Preliminary defn, terms and examples – 4 days.</li> <li>b. Connectedness and related concepts – 4 days</li> <li>c. Compactness and related concepts – 3 days</li> <li>d. FIP, Tot. bdd. sets, Bolzano-weierstrass property, Sequential compactness, Heine- Borel thm</li> <li>– 4 days</li> </ul>	Thomas of National
15	15	of classes
27 <sup>th</sup> Oct -15 <sup>th</sup> Nov	5 <sup>th</sup> Oct-26th Oct.	Tentative Schedule Unit wise (DoC-DoE)
White board, Smart (U- 1 & U- 2) board, Projector	Green board, Smart board, Projector	Tentative Pedagogy
Test-1 (U- 1 & U- 2)		Unit Allotted for Sessional Test
		Remarks

5	4	ω	
Sequence and Series of functions  a. Sequence of functions, pointwise convergence, Uniform convergence- 4 days  b. Uniformly bdd. Sequence, Cauchy's criterion for uniform convergence, Uniformly Cauchy Sequence - 4 days  c. Weierstrass M-test, Dini's thm., Uniform convergence and continuity - 3 days  d. Uniform convergence and integration, Uniform convergence and differentiation, Weierstrass theorem - 4 days	Sequence and Series in Metric Spaces  a. Sequence, convergence, limsup, liminf and Bolzano Weierstrass thm for sequence- 4 days  b. Cauchy Sequence and convergence of Series-4 days  c. Tests for convergence of series- 4 days d. Absolute convergence, conditional conv., Rearrangement of terms-3 days	Differentiation and Integration  a. Derivatives and related concepts – 3 dsys  b. Mean Value Theorems and related concepts – 3 dsys  c. Indeterminate forms, L Hospital's rules – 3 days  d. Higher order derivatives & series expansion – 2 dsys  e. Vecor valued fns. and their derivatives – 4 dsys	a. Continuity and compactness, Discontinuities – 4
15	15	15	
16 <sup>th</sup> Dec-1 <sup>st</sup> Jan	2 <sup>nd</sup> Dec-15 <sup>th</sup> Dec	16th Nov-1st Dec	
White board, Smart board, Projector	White board, Smart board, Projector	White board, Smart board, Projector	
Test-3 U-5		Test-2 (U-3 & U- 4)	

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## Suggested Books/Reference Books:

- R. G. Bartle, D. R. Sherbert. Introduction to Real Analysis (wiley India) S. C. Malik and S. Arora. Mathematical Analysis New Age International T. M. Apostol, Mathematical Analysis. Marisa Publication

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Verified by DUC

Dr.Prabin Das. .....

Signature of the Faculty