University of Science & Technology Meghalaya

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	5th Oct-25th Oct	White board, Smart board, Projector	Test-I	
2	Fourier transform	15	27th Oct -15th Nov	White board, Smart board, Projector		
3	Fradholm Integral equation	15	16th Nov-1st Dec	White board, Smart board, Projector	Test-II	
4	Volterra Integral equation	15	2nd Dec-15th Dec	White board, Smart board, Projector		
5	Milne transform and hankel transform	15	16th Dec-1st 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

<u>Session: 2021-2022(Odd Semester)</u>

Program: M.Sc.   Semester:III

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

Name of the Faculty: Dr. Pinkimani Goswami

<u>Details Plan</u>

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				
	Perfect numbers, Mersennenumbers, 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.

Unit	Topic	Hours	Date			Test	Remarks
	residue classes and reduced residue classes	2					
	Euler-Fermat's Theorem. Wilson's Theorem	3					
	linear congruence, Chinese Remainder Theorem,	5					
	polynomial congruence.	2					
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			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 given to improve problem solving skill.
	Legendre's symbol, Euler's Criterion, Gauss' Lemma	3					
	Quadratic reciprocity Law, Jacobi symbol,	5					
	quadratic congruence of second degree with prime modulus and with composite modulus.	5					
Unit 5	Fibonacci numbers, the Fibonacci sequences, certain identities involving Fibonacci		16/01/22- 23/01/22			Test-III (Unit 4 & 5)	Homework & Assignment will be given to improve problem solving skill.

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

Suggested Books/Reference Books:

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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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		
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	
					Test-III	
					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: 3rd

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		
					Test-II	
					Unit 3	
					Test-III	
					Unit 4	

Suggested Books/Reference Books:

1. Higher Algebra by S. K. Mappa

2. Higher Engineering Mathematics, H.K. Dass

University of Science & Technology Meghalaya

Department of Mathematics

Lesson Plan

Session: 2021-2022(Odd Semester)

Program: M. Sc.   Semester: 3rd

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	
					Unit 4	
5	Motion in plane	15	29-11-2021 to 20-12-2021	Whiteboard, smartboard, projector		
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 Univesrity Press

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Department of Mathematics

Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.   Semester:3rd

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 differentiation	
					Test-III	
					Curl, divergence, gradient	

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

Details Plan

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						
3	Analysis of Strain, Lagrangian And Eularian Description of Deformation Tensor, Cauchy Principle	5	26/11- 2/12	White 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	

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

Suggested Books/Reference Books:

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

2. M D Raishinania, Hydrodynamics, S Chand

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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

Details Plan

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	1	21/10-25/10	White board		
	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		
	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		

Suggested Books/Reference Books:

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**...

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	5th Oct-25th Oct	White board, Smart board, Projector	Test-I	
2	Fourier transform	15	27th Oct -15th Nov	White board, Smart board, Projector		
3	Fradholm Integral equation	15	16th Nov-1st Dec	White board, Smart board, Projector	Test-II	
4	Volterra Integral equation	15	2nd Dec-15th Dec	White board, Smart board, Projector		
5	Milne transform and hankel transform	15	16th Dec-1st 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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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

Details Plan

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				
	Perfect numbers, Mersennenumbers, 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 and reduced	2			
		residue classes				
		Euler-Fermat's Theorem. Wilson's Theorem	3			
		linear congruence, Chinese Remainder Theorem,	5			
		polynomial congruence.	2			
	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		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 given to improve problem solving skill.
		Legendre's symbol, Euler's Criterion, Gauss' Lemma	3				
		Quadratic reciprocity Law, Jacobi symbol,	5				
		quadratic congruence of second degree with prime modulus and with composite modulus.	5				
	Unit 5	Fibonacci numbers, the Fibonacci sequences, certain identities involving Fibonacci		16/01/22- 23/01/22		Test-III (Unit 4 & 5)	Homework & Assignment will be given to improve problem solving skill.

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

Suggested Books/Reference Books:

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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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		
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	
					Test-III	
					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: 3rd

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		
					Test-II	
					Unit 3	
					Test-III	
					Unit 4	

Suggested Books/Reference Books:

1. Higher Algebra by S. K. Mappa

2. Higher Engineering Mathematics, H.K. Dass

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Lesson Plan

Program: M. Sc.   Semester: 3rd

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	
					Unit 4	
5	Motion in plane	15	29-11-2021 to 20-12-2021	Whiteboard, smartboard, projector		
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 Univesrity Press

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Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.   Semester:3rd

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 differentiation	
					Test-III	
					Curl, divergence, gradient	

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

Details Plan

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						
3	Analysis of Strain, Lagrangian And Eularian Description of Deformation Tensor, Cauchy Principle	5	26/11- 2/12	White 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	

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

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

Program: M.Sc.   Semester: III

Name of the Course: Operation Research.   Course Code:MSM 305

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	Basics and History of Operation Research	5	5/10- 20/10	White board, Smart Board	Test-I Unit-I	
	Phase of OR	1	21/10-25/10	White board		
	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		
	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		

Suggested Books/Reference Books:

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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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	5th Oct-25th Oct	White board, Smart board, Projector	Test-I	
2	Fourier transform	15	27th Oct -15th Nov	White board, Smart board, Projector		
3	Fradholm Integral equation	15	16th Nov-1st Dec	White board, Smart board, Projector	Test-II	
4	Volterra Integral equation	15	2nd Dec-15th Dec	White board, Smart board, Projector		
5	Milne transform and hankel transform	15	16th Dec-1st 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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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

Details Plan

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				
	Perfect numbers, Mersennenumbers, 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 and reduced residue classes	2				
	Euler-Fermat's Theorem. Wilson's Theorem	3				
	linear congruence, Chinese Remainder Theorem,	5				
	polynomial congruence.	2				
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		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 given to improve problem solving skill.
	Legendre's symbol, Euler's Criterion, Gauss' Lemma	3				
	Quadratic reciprocity Law, Jacobi symbol,	5				
	quadratic congruence of second degree with prime modulus and with composite modulus.	5				
Unit 5	Fibonacci numbers, the Fibonacci sequences, certain identities involving Fibonacci		16/01/22- 23/01/22		Test-III (Unit 4 & 5)	Homework & Assignment will be given to improve problem solving skill.

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

Suggested Books/Reference Books:

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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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		
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	
					Test-III	
					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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Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.

Semester: 3rd

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		
					Test-II	
					Unit 3	
					Test-III	
					Unit 4	

Suggested Books/Reference Books:

1. Higher Algebra by S. K. Mappa

2. Higher Engineering Mathematics, H.K. Dass

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Lesson Plan

<u>Session: 2021-2022(Odd Semester)</u>

Program: M. Sc.

Semester: 3rd

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 Univesrity Press

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Lesson Plan

Session: 2021-2022(Odd Semester)

Program: B. Sc.   Semester:3rd

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 differentiation	
					Test-III	
					Curl, divergence, gradient	

Suggested Books/Reference Books:

1. Engineering Mathematics by H. K. Dass

2. Vector analysis, Schuum outline

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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

Details Plan

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						
3	Analysis of Strain, Lagrangian And Eularian Description of Deformation Tensor, Cauchy Principle	5	26/11- 2/12	White 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	

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

Suggested Books/Reference Books:

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

2. M D Raishinania, Hydrodynamics, S Chand

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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

Details Plan

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	1	21/10-25/10	White board		
	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		
	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		

Suggested Books/Reference Books:

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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Lesson Plan

Program: M.Sc.

Name of the Course: Real Analysis

Name of the Faculty: Dr. Prabin Das

Semester: 1st

Course Code: MSM 101

Details Plan

Unit	Topic	Targeted No. of classes Unit wise	Tentative Schedule (DoC-DoE)	Tentative Pedagogy	Unit Allotted for Sessional Test	Remarks
1	Theory of Metric Spaces a. Preliminary defn, terms and examples – 4 days. b. Connectedness and related concepts – 4 days c. Compactness and related concepts – 3 days d. FIP, Tot. bdd. sets, Bolzano-weierstrass property, Sequential compactness, Heine- Borel thm – 4 days	15	5th Oct-26th Oct.	Green board, Smart board, Projector	Test	
2	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	15	27th Oct -15th Nov	White board, Smart board, Projector	Test-1 (U- 1 & U- 2)	

#	Topic / Content	Hours	Date	Resources	Test
	d. Continuity and compactness, Discontinuities – 4				
3	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	15	16th Nov–1st Dec	White board, Smart board, Projector	Test-2 (U-3 & U- 4)
4	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	15	2nd Dec-15th Dec	White board, Smart board, Projector	
5	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	15	16th Dec-1st Jan	White board, Smart board, Projector	Test-3 U-5

Suggested Books/Reference Books:

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

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