

Lesson Plan for Course: B.Sc. (H) Class-3rd Year Code: MTMA Paper-V Marks: 100

- Course Name: Real Analysis II, Metric Space, Complex Analysis.
- Course coordinator: Biswajit Sarkar
- Course Outcomes:
 - CO-1. Understand fundamental idea of metric spaces including Cantor's theorem.
 - CO-2. Learn about Continuity, Uniform continuity, Compactness, Homeomorphism of metric space.
 - CO-3. Realize Banach Fixed point Theorem and its application to ordinary differential equation.
 - CO-4. Learn Cauchy-Riemann equation and differentiability of complex valued function.
 - CO-5. To become familiar with different types of complex valued functions and differences between complex and real valued functions.
 - CO-6. Evaluate Contour integrals and learn about Cauchy integral formula.
 - CO-7. Evaluate Laurent series expansion of complex valued function.

Course planner

Month	Course Topic	Teacher	No. of Classes	Remarks*
July	Real Analysis II	PD	14	Theoretical-11 Tutorial-03
August	Real Analysis II	PD	22	Theoretical-20 Tutorial-02
Sept	Real Analysis II	PD	17	Theoretical-15 Tutorial-02
Oct				Theoretical-00 Tutorial-00
Nov	Complex Analysis	SM	04	Theoretical-02 Tutorial-02
Dec	Complex Analysis	SM	03	Theoretical-14 Tutorial-03
	Metric Space V	BS	14	
Jan				Theoretical-00 Tutorial-00
Feb				Theoretical-00 Tutorial-00
Mar Apr May Jun	Final Examination			
	Assessment: Test Examination		Total: 74	Theoretical-62 Tutorial-12

Books:

- A.K. Choudhury & P. Mondal, Mathematical Analysis- Real, Complex and Metric Spaces, New Central Book Agency.
- V. Karunakaran, Real Analysis, Pearson.
- Arumugam, Complex Analysis, Scitech Publications (India) Pvt Ltd.
- P. K. Jain, Metric Spaces, Narosa.

Lesson Plan for Course: B.Sc. (H) Class-3rd Year Code: MTMA Paper-VI Marks: 100

- Course Name: Probability & Statistics, Numerical Analysis & Computer Programming
- Course coordinator: Pintu Debnath
- Course Outcomes:
 - CO-1. Understand the basic concepts of classical probability.
 - CO-2. Learn probability distribution and density function and their properties with example.
 - CO-3. Understand central limit theorem which shows that the empirical frequencies of so many natural populations exhibit normal distribution.
 - CO-4. Learn algorithms of a programme.
 - CO-5. Find out Relative error and Round off error.
 - CO-6. To find root of a algebraic an transcendental equation through several techniques.
 - CO-7. To solve system of linear equations using Gaussian Elimination, Gauss Jordan methods, and LU Decomposition.
 - CO-8. Learn various types of interpolation methods such as Lagrange and Newton's methods.
 - CO-9. Learn numerical differentiation based on finite differences.
 - CO-10. Learn numerical integration by Newton Cotes formula, Trapezoidal rule and Weddle's rule.
 - CO-11. Find solution of ODEs at a given point by Euler's method.
 - CO-12. Learn about several high-level programming languages.
 - CO-13. Able to construct flowchart.
 - CO-14. Learn about various commands of computer programming.
 - CO-15. To write and run computer programme.

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Month	Course Topic	Teacher	No. of Classes	Remarks*
July	Probability	SM	11	Theoretical-23 Tutorial-03
	Statistics	BS	15	
August	Probability	SM	16	Theoretical-38 Tutorial-09
	Computer Programming		04	
	Statistics Numerical Analysis	BS	15 12	
Sept	Computer Programming	SM	16	Theoretical-29 Tutorial-06
	Numerical Analysis	BS	19	
Oct	Computer Programming	SM	06	Theoretical-04 Tutorial-02
Nov				Theoretical-00 Tutorial-00
Dec				Theoretical-00 Tutorial-00
Jan				Theoretical-00 Tutorial-00
Feb				Theoretical-00 Tutorial-00
Mar Apr May Jun	Final Examination			
	Assessment: Test Examination		Total: 114	Theoretical-94 Tutorial-20

Books:

- W. Feller, An introduction to probability theory and its applications (Vol-1)
- S. K. De, S. Sen and Banerjee, Mathematical Probability (U. N. Dhur & Sons Pvt. Ltd.)
- S. K. De and S. Sen, Mathematical Statistics (U. N. Dhur & Sons Pvt. Ltd.)
- C. Xavier, FORTRAN 77 and numerical methods (Wiley Eastern limited).
- Yashvant Kanetkar, Let us C (BPP Publications).
- S. A. Molla, An Introduction to Numerical Analysis (Central Book Agency).

Lesson Plan for Course: B.Sc. (H) Class-3rd Year Code: MTMA Paper-VII Marks: 100

- Course Name: Vector Analysis II, Analytical Statics, Rigid Dynamics, Hydrostatics
- Course coordinator: Biswajit Sarkar
- Course Outcomes:
 - CO-1. Calculate line integrals as integrals of vectors and some of its applications.
 - CO-2. Verify Green's theorem, Stokes' theorem and Divergence theorem and their applications.
 - CO-3. To find the positions of equilibrium of a particle lying on a plane curve and rough surface.
 - CO-4. Determine Center of Gravity of Rigid Body.
 - CO-5. Deduce conditions of equilibrium of a particle under coplanar forces by principle of virtual work.
 - CO-6. To determine the condition of stability of equilibrium of a perfectly rough heavy body and a system of forces acting on a body.
 - CO-7. Understand D'Alembert's equations of motion.
 - CO-8. Understand the principle of conservation of energy.
 - CO-9. Understand the motion of a rigid body moving in two dimensions under finite and impulsive forces.
 - CO-10. Learn about the depth of the centre of pressure of a plane area.
 - CO-11. Find equilibrium conditions of fluids in given fields of force.
 - CO-12. To calculate the condition of stability of the equilibrium of floating bodies.
 - CO-13. Find relation between pressure and density and temperature.

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Month	Course Topic	Teacher	No. of Classes	Remarks*
July				Theoretical-00 Tutorial-00
August				Theoretical-00 Tutorial-00
Sept				Theoretical-00 Tutorial-00
Oct				Theoretical-00 Tutorial-00
Nov				Theoretical-00 Tutorial-00
Dec	Vector Analysis II	SM	09	Theoretical-10 Tutorial-05
	Hydrostatics	SM	06	
Jan	Analytical Statics	PD	05	Theoretical-10 Tutorial-07
	Hydrostatics	SM	08	
	Rigid Dynamics	BS	04	
Feb	Analytical Statics	PD	18	Theoretical-36 Tutorial-08
	Hydrostatics	SM	06	
	Rigid Dynamics	BS	20	
Mar	Final Examination			
Apr				
May				
Jun				
	Assessment: Test Examination		Total: 76	Theoretical-56 Tutorial-20

Books:

- S. L. Loney, Analytical Statics.
- M. C. Ghosh, Analytical Statics.
- S. L. Loney, Dynamics of a Particle and Rigid bodies.
- A. S. Ramsay, Hydrostatics.

Lesson Plan for Course: B.Sc. (H) Class-3rd Year Code: MTMA Paper-VIIIA Marks: 50

- Course Name: Algebra III, Differential Equation III, Tensor Algebra and Calculus
- Course coordinator: Sudip Mondal
- Course Outcomes:
 - CO-1. Understand Boolean algebra and functions, logic gates, switching circuits and their applications.
 - CO-2. To conceptualize the context free grammars and pushdown automata, Turing machines, Undesirability.
 - CO-3. To apply Laplace Transformations in ordinary differential equations.
 - CO-4. Find Power Series solution of ordinary differential equations.
 - CO-5. To realize tensor as generalized concept of a vector in a Euclidean space.
 - CO-6. To conceptualize of products of tensors, Christoffel symbols and their laws of transformations.

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Month	Course Topic	Teacher	No. of Classes	Remarks*
July				Theoretical-00 Tutorial-00
August				Theoretical-00 Tutorial-00
Sept				Theoretical-00 Tutorial-00
Oct				Theoretical-00 Tutorial-00
Nov	Algebra III (Modern) VIIIA	PD	14	Theoretical-11 Tutorial-03
Dec	Algebra III (Boolean) VIIIA	PD	15	Theoretical-21 Tutorial-08
	Tensor Algebra and Calculus VIIIA	PD	06	
	Differential Equation III VIIIA	BS	08	
Jan	Differential Equation III VIIIA	BS	02	Theoretical-02 Tutorial-00
Feb	Algebra III (Linear) VIIIA	SM	09	Theoretical-07 Tutorial-02
Mar	Final Examination			
Apr				
May				
Jun				
	Assessment: Test Examination		Total: 54	Theoretical-41 Tutorial-13

Books:

- S.K. Mapa, Modern Algebra, Sarat Book
- David Widder, Advanced Calculus (Prentice Hall)
- B. Sen, Elementary Treatise on Laplace Transform (World Press).
- Vector Analysis and Tensor Calculus (Schaum Series) – Spiegel.

Lesson Plan for Course: B.Sc. (H) Class-3rd Year Code: MTMA Paper-VIIIIB Marks: 50

- Course Name: Numerical Methods
- Course coordinator: Pintu Debnath
- Course Outcomes:
 - CO-1. To calculate function value by using Newton's forward & backward interpolation.
 - CO-2. To determine numerical integration by using Trapezoidal and Weddle's rule.
 - CO-3. To solve non-linear equations through several methods.
 - CO-4. To find numerical solution of a system of linear equations.
 - CO-5. To able to calculate Sample characteristics, Correlation coefficient, and regression lines.
 - CO-6. To write C-programming for Simpson's 1/3 rule, Newton-Raphson and Runge-Kutta methods.

Course planner

Month	Course Topic	Teacher	No. of Classes	Remarks*
July				Theoretical-00 Tutorial-00
August				Theoretical-00 Tutorial-00
Sept	Statistics	PD	08	Theoretical-10 Tutorial-07
	Numerical Analysis	BS	09	
Oct	Statistics	PD	13	Theoretical-20 Tutorial-08
	Computer Programming	SM	04	
	Numerical Analysis	BS	11	
Nov	Computer Programming	SM	07	Theoretical-18 Tutorial-04
	Numerical Analysis	BS	15	
Dec				Theoretical-00 Tutorial-00
Jan				Theoretical-00 Tutorial-00
Feb				Theoretical-00 Tutorial-00
Mar	Final Examination			
Apr				
May				
Jun				
	Assessment: Test Examination		Total: 67	Theoretical-48 Tutorial-19

Books:

- S. A. Molla, An Introduction to Numerical Analysis (Central Book Agency).
- C. Xavier, FORTRAN 77 and numerical methods (Wiley Eastern limited).
- Yashvant Kanetkar, Let us C (BPB Publications).
- S. K. De and S. Sen, Mathematical Statistics (U. N. Dhur & Sons Pvt. Ltd.)