

## I – Academic Planner

### A. Teaching Plan (Year:2021-2022 Semester: odd)

Teacher's Name: Mr. Stanzin Dorjai Department: Mathematics

S. No.	UPC	Paper Name	Core/AECC/GE/SEC	Topic/Unit	Start Date	End Date
1	32351202	BSc (Hons) Mathematics Semester-V <b>Numerical Analysis</b>	Core	Algorithms, Convergence, Order of convergence and examples. Bisection method, False position method and their convergence analysis, Stopping condition and algorithms.	20 <sup>th</sup> july 2021	7 <sup>th</sup> august 2021
				Fixed point iteration method, its order of convergence and stopping condition. Newton's method, Secant method, their order of convergence and convergence analysis.	8 <sup>th</sup> august 2021	16 <sup>th</sup> august 2021
				Examples to understand partial and scaled partial pivoting. LU decomposition. Application of LU decomposition to solve system of linear equations. Gauss–Jacobi method, Gauss–Seidel and SOR iterative methods to solve system of linear equations.	17 <sup>th</sup> august 2021	30 <sup>th</sup> august 2021
				Lagrange interpolation: Linear and higher order interpolation, and error in it. Divided difference and Newton interpolation, Piecewise linear interpolation. First and higher order approximation for first derivative and error in the approximation	1 <sup>st</sup> sept 2021	25 <sup>th</sup> sept 2021
				Second order forward, Backward and central difference approximations for second derivative, Richardson extrapolation method.	26 <sup>th</sup> sept 2021	15 <sup>th</sup> Oct 2021
				Numerical integration: Trapezoidal rule, Simpson's rule and its error analysis.	16 <sup>th</sup> Oct 2021	17 <sup>th</sup> Oct 2021
				Euler's method to solve ODE's, Second order Runge–Kutta methods: Modified Euler's method, Heun's method and optimal RK2 method.	18 <sup>th</sup> Oct 2021	28 <sup>th</sup> August 2021
2	32351202	BSc (Hons) Mathematics Semester-II	Core	Practical 1 & 2	20 <sup>th</sup> july 2021	7 <sup>th</sup> august 2021
				Practical 3&4	8 <sup>th</sup> august 2021	16 <sup>th</sup> august 2021

		<b>Numerical Analysis</b>		Practical 5&6	17 <sup>th</sup> august 2021	30 <sup>th</sup> august 2021
				Practical 7&8	1 <sup>st</sup> sept 2021	25 <sup>th</sup> sept 2021
				Practical 9&10	25 <sup>th</sup> sept 2022	15 <sup>th</sup> Oct 2022
				Practical 11&12	16 <sup>th</sup> Oct 2021	17 <sup>th</sup> Oct 2021
				Practical 13 & 14	18 <sup>th</sup> Oct 2022	28 <sup>th</sup> Nov 2022
<b>3</b>	32355202	BSc (Prog) Semester-II <b>Calculus</b>	core	The first derivative test for relative extrema, Concavity and inflection points, Second derivative test for relative extrema, Curve sketching using first and second derivative tests. Limits to infinity and infinite limits, Graphs with asymptotes, Vertical tangents and cusps, L'Hôpital's rule	22 <sup>nd</sup> Nov 2021	15 <sup>th</sup> Dec 2021
				Parametric representation of curves and tracing of parametric curves (except lines in $\mathbb{R}$ ), Polar coordinates and the relationship between Cartesian and polar coordinates. Tracing of curves in polar coordinates. Volumes by slicing disks and method of washers. Volumes by cylindrical shells, Arc length, Arc length of parametric curves.	16 <sup>th</sup> Dec 2021	10 <sup>th</sup> jan 2021
				Area of surface of revolution. Reduction formulae, and to obtain the iterative formulae for the integrals of the $\sin x$ , $\cos x$ , $\tan x$ , $\cot x$ , $\sec x$ , $\csc x$ .	11 <sup>th</sup> Jan 2022	20 <sup>th</sup> Jan 2022
				Techniques of sketching conics: parabola, ellipse and hyperbola. Reflection properties of conics, Rotation of axes, second degree equations and their classification into conics using the discriminant..	21 <sup>st</sup> feb 2022	15 <sup>th</sup> feb 2022
				Reflection properties of conics, Rotation of axes, second degree equations and their classification into conics using the discriminant..	16 <sup>th</sup> feb 2022	28 <sup>th</sup> feb 2022
				Vector-valued functions, Differentiation of vector-valued functions, gradients, divergence, curl and their geometrical interpretation. Spheres, Cylindrical surfaces. Illustrations of graphing standard quadric surfaces like cone, ellipsoid.	1 <sup>st</sup> march 2022	11 <sup>th</sup> March 2022

**B. FDP/Seminar/Workshops/Lectures to be attended and/or to be conducted by Teachers**

<b>Event Topic</b>				
<b>Type / Nature (FDP/Webinar/Workshop etc.)</b>				
<b>Organizing In-charge</b>				
<b>Details regarding invited Resource Person</b>				
<b>Nature of Participation (e.g. Invited Speaker, Participant etc.)</b>				
<b>Date/s</b>		<b>Timing/s</b>		<b>Mode</b>

**C. Internal Assessment: House Exam (Test/Presentation etc.) & Assignment\***

<b>Course Code</b>	<b>Course Name</b>	<b>Unique Paper Code</b>	<b>Topic Name</b>	<b>Day and Date</b>	<b>Date/s of Exhibiting the Assessment Sheet to students, Discussing the marks, Returning/Retaining</b>
563	BSc (Hons) Mathematics Semester-v <b>Numerical analysis</b>	32357501	Class Test on Unit 1 & Unit 2	7 <sup>th</sup> Dec 2021	14 <sup>th</sup> Dec 2021
582	BSc (Prog) Semester-I <b>Calculus</b>	32355101	Assignment Unit 3 & 4	1 <sup>th</sup> march 2021	10 <sup>th</sup> march 2022
582	BSc (Prog) Semester-I <b>Calculus</b>	32355101	Class Test on Unit 1 & Unit 2	3 <sup>th</sup> March 2021	10 <sup>th</sup> March 2022
563	BSc (Hons) Mathematics Semester-v <b>Practical Numerical Analysis</b>	32357501	Class Test on Practical 1 to 10	20 <sup>th</sup> Dec 2021	20 <sup>th</sup> Dec 2021

**\*Marks of the Internal Assessment to be submitted to the College 15 days before the last working day of every semester**

**D. Organization of Department/College Society Meetings by Staff Advisor/Convener**

<b>Department/Society</b>	<b>Meeting Date</b>	<b>Purpose</b>
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**E. College Functions**

<b>College Function</b>	<b>Function Date</b>	<b>Role to be played</b>

## I – Academic Planner

### B. Teaching Plan (Year:2021-2022 Semester: Even)

Teacher's Name: Mr. Stanzin Dorjai Department: Mathematics

S. No.	UPC	Paper Name	Core/AECC/GE/SEC	Topic/Unit	Start Date	End Date
1	32351202	BSc (Hons) Mathematics Semester-II <b>Differential Equations</b>	Core	Differential equations and mathematical models, Order and degree of a differential equation, Exact differential equations and integrating factors of first order differential equations, Reducible second order differential equations.	7 <sup>th</sup> April 2022	18 <sup>th</sup> April 2022
				Application of first order differential equations to acceleration-velocity model, Growth and decay model.	19 <sup>th</sup> April 2022	3 <sup>rd</sup> May 2022
				Introduction to compartmental models, Lake pollution model (with case study of Lake Burley Griffin)		
				Drug assimilation into the blood (case of a single cold pill, case of a course of cold pills, Case study of alcohol in the bloodstream).	17 <sup>th</sup> May 2022	30 <sup>th</sup> May 2022
				Exponential growth of population, Density dependent growth, Limited growth with harvesting.		
				General solution of homogeneous equation of second order, Principle of superposition for a homogeneous equation; Wronskian, its properties and applications; Linear homogeneous and non-homogeneous equations of higher order with constant coefficients; Euler's equation.	1 <sup>st</sup> June 2022	14 <sup>th</sup> June 2022
				Method of undetermined coefficients, Method of variation of parameters; Applications of second order differential equations to mechanical vibrations.	15 <sup>th</sup> June 2022	29 <sup>th</sup> June 2022
				Interacting population models, Epidemic model of influenza and its analysis, Predator-prey model and its analysis, Equilibrium points, Interpretation of the phase plane, Battle model and its analysis.	30 <sup>th</sup> June 2022	14 <sup>th</sup> July 2022
				Revision	15 <sup>th</sup> July 2022	4 <sup>th</sup> August 2022
				Practical 1 & 2	07.04.22	14.04.22

2	32351202	BSc (Hons) Mathematics Semester-II <b>Differential Equations Practical</b>	Core	Practical 3&4	15.04.22	03.05.22
				Practical 5&6	17.05.22	30.05.22
				Practical 7&8	01.06.22	14.06.22
				Practical 9&10	15.06.22	30.06.22
				Practical 11&12	28.07.22	13.07.22
				Revision	14.07.22	02.08.22
3	32355202	BSc (Prog) Semester-II <b>Calculus and Geometry</b>	core	The first derivative test for relative extrema, Concavity and inflection points, Second derivative test for relative extrema, Curve sketching using first and second derivative tests. Limits to infinity and infinite limits, Graphs with asymptotes, Vertical tangents and cusps, L'Hôpital's rule	7 <sup>st</sup> April 2022	18 <sup>th</sup> April 2022
				Parametric representation of curves and tracing of parametric curves (except lines in $\mathbb{R}$ ), Polar coordinates and the relationship between Cartesian and polar coordinates. Tracing of curves in polar coordinates. Volumes by slicing disks and method of washers. Volumes by cylindrical shells, Arc length, Arc length of parametric curves.	19 <sup>th</sup> April 2022	3 <sup>rd</sup> May 2022
				Area of surface of revolution. [1] Chapter 5 (Section 5.5). Week 9: Reduction formulae, and to obtain the iterative formulae for the integrals of the $\sin x$ , $\cos x$ , $\tan x$ , $\cot x$ , $\sec x$ , $\csc x$ .	17 <sup>th</sup> May 2022	30 <sup>th</sup> May 2022
				Techniques of sketching conics: parabola, ellipse and hyperbola. Reflection properties of conics, Rotation of axes, second degree equations and their classification into conics using the discriminant..	1 <sup>st</sup> June 2022	14 <sup>th</sup> June 2022
				. Reflection properties of conics, Rotation of axes, second degree equations and their classification into conics using the discriminant..	15 <sup>th</sup> June 2022	29 <sup>th</sup> June 2022
				Vector-valued functions, Differentiation of vector-valued functions, gradients, divergence, curl and their geometrical interpretation.	30 <sup>th</sup> June 2022	14 <sup>th</sup> July 2022
				Spheres, Cylindrical surfaces. Illustrations of graphing standard quadric surfaces like cone, ellipsoid.	15 <sup>th</sup> July 2022	25 <sup>th</sup> July 2022

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**G. Internal Assessment: House Exam (Test/Presentation etc.) & Assignment\***

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563	BSc (Hons) Mathematics Semester-II <b>Differential Equations</b>	32351202	Class Test on Unit 1 & Unit 2	Monday 27 <sup>th</sup> June 2022	Monday 4 <sup>th</sup> July 2022
582	BSc (Prog) Semester-II <b>Calculus and Geometry</b>	42351201	Assignment Unit 3 & 4	Thursday 21 <sup>th</sup> July 2022	Thursday 28 <sup>th</sup> July 2022
582	BSc (Prog) Semester-II <b>Calculus and Geometry</b>	42351201	Class Test on Unit 1 & Unit 2	Monday 27 <sup>th</sup> June 2022	Monday 4 <sup>th</sup> July 2022
563	BSc (Hons) Mathematics Semester-II <b>Differential Equations Practical</b>	32351202	Class Test on Practical 1 to 10	Friday 29 <sup>th</sup> July 2022	Friday 5 <sup>th</sup> August 2022

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**H. Organization of Department/College Society Meetings by Staff Advisor/Convener**

<b>Department/Society</b>	<b>Meeting Date</b>	<b>Purpose</b>