

I – Academic Planner

A. Teaching Plan (Year:2020-2021 Semester: Odd)

Teacher's Name: Mr. B Semthanga Department: Mathematics

| S. No. | UPC | Paper Name | Core/ AECC /GE/SEC | Topic/Unit | Start Date | End Date |
|--------|----------|---|--------------------|--|---------------------------------------|---------------------------------------|
| 1 | 32351501 | BSc (Hons) Semester-V Metric Spaces | Core | Definition of metric space, Illustration using the usual metric on \mathbb{R} , Euclidean and max metric on \mathbb{R} and \mathbb{C} , Euclidean and max metric on \mathbb{R} , Discrete metric, Sup metric on $B(S)$ and $C[a, b]$. Sequences in metric space, Definition of limit of a sequence, Illustration through examples, Cauchy sequences | 10 th August 2020 | 24 th August 2020 |
| | | | | Definition of complete metric spaces, Illustration through examples. Open and closed balls, Neighborhood, Open sets, Examples and basic results. | 25 th August 2020 | 8 th September 2020 |
| | | | | Interior point, Interior of a set, Limit point, Derived set, Examples and basic results. Closed set, Closure of a set, Examples and basic results. | 9 th September 2020 | 23 rd September 2020 |
| | | | | Bounded set, Diameter of a set, Cantor's theorem. Relativisation and subspaces, Dense sets. | 24 th September 2020 | 8 th October 2020 |
| | | | | Continuous mappings, Sequential and other characterizations of continuity, Uniform continuity, Homeomorphism, Contraction mappings, Banach fixed point theorem. | 9 th October 2020 | 23 rd October 2020 |
| | | | | Connectedness and compactness | 24 th October 2020 | 2 nd November 2020 |
| | | | | Definitions and properties of connected and compact spaces. | 3 rd November 2020 | 17 th November 2020 |
| | | | | Revision | 18 th November 2020 | 28 th November 2020 |

| S. No. | UPC | Paper Name | Core/ AECC /GE/SEC | Topic/Unit | Start Date | End Date |
|--------|----------|---|--------------------|--|--------------------------------|--------------------------------|
| 1 | 32351102 | BSc (Hons) Mathematics Semester-I Algebra | Core | Polynomials, The remainder and factor theorem, Synthetic division, Factored form of a polynomial, Fundamental theorem of algebra, Relations between the roots and the coefficients of polynomial equations, Theorems on imaginary, integral and rational roots. | 18 th November 2020 | 31 st November 2020 |
| | | | | Polar representation of complex numbers, De Moivre's theorem for integer and rational indices and their applications, The nth roots of unity. | 1 st December 2020 | 13 th December 2020 |
| | | | | Equivalence relations, Functions, Composition of functions, Invertibility and inverse of functions, One-to-one correspondence and the cardinality of a set. | 14 th December 2020 | 28 th December 2020 |
| | | | | Well ordering principle, The division algorithm in \mathbb{Z} , Divisibility and the Euclidean algorithm, Modular arithmetic and basic properties of congruences, Statements of the fundamental theorem of arithmetic and principle of mathematical induction. | 29 th December 2020 | 10 th January 2021 |
| | | | | Systems of linear equations, Row reduction and echelon forms, Vector equations, The matrix equation $Ax = b$, Solution sets of linear systems, The inverse of a matrix. | 11 th January 2021 | 24 th January 2021 |
| | | | | Subspaces, Linear independence, Basis and dimension | 25 th January 2021 | 31 st January 2021 |
| | | | | The rank of a matrix and applications. Introduction to linear transformations, Matrix of a linear transformation; Applications to computer graphics. | 1 st February 2021 | 14 th February 2021 |
| | | | | Introduction to linear transformations, Matrix of a linear transformation; Applications to computer graphics. Eigenvalues and eigenvectors, The characteristic equation and Cayley–Hamilton theorem | 15 th February 2021 | 28 th February 2021 |
| | | | | Revision | 1 st March 2021 | 5 th March 2021 |
| 2 | 32351101 | BSc (Hons) Mathematics Semester-I Calculus | Core | Practical 1 & 2 | 18.11.20 | 02.12.20 |
| | | | | Practical 3&4 | 03.12.20 | 17.12.20 |
| | | | | Practical 5&6 | 18.12.20 | 02.01.21 |
| | | | | Practical 7&8 | 03.01.21 | 17.01.21 |
| | | | | Practical 9&10 | 18.01.21 | 31.02.21 |
| | | | | Practical 11&12 | 01.02.21 | 14.02.21 |
| | | | | Revision | 15.02.21 | 05.03.21 |

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

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

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

| Course Code | Course Name | Unique Paper Code | Topic Name | Day and Date | Date/s of Exhibiting the Assessment Sheet to students, Discussing the marks, Returning/Retaining |
|--------------------|---|--------------------------|---------------------------------------|--|---|
| 563 | BSc (Hons) Semester-V Metric Spaces | 32351501 | Class Test Unit 1, Unit 2 & Unit 3 | Monday 19 th October 2020 | Monday 26 th October 2020 |
| 563 | BSc (Hons) Semester-V Metric Spaces | 32351501 | Assignment Unit 4 | Thursday 12 th November 2020 | Thursday 19 th November 2020 |
| 563 | BSc (Hons) Mathematics Semester-I Algebra | 32351102 | Class Test Unit 1, Unit 2 & Unit 3 | Friday 22 nd January 2021 | Friday 29 th January 2021 |
| 563 | BSc (Hons) Mathematics Semester-I Algebra | 32351102 | Assignment Unit 4 | Thursday 25 th February 2021 | Thursday 4 th February 2021 |
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***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

| Department/Society | Meeting Date | Purpose |
|---------------------------|---------------------|----------------|
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E. College Functions

| College Function | Function Date | Role to be played |
|-------------------------|----------------------|--------------------------|
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I – Academic Planner

B. Teaching Plan (Year:2020-2021 Semester: Even)

Teacher's Name: Mr. B Semthanga Department: Mathematics

| S. No. | UPC | Paper Name | Core/AECC/GE/SEC | Topic/Unit | Start Date | End Date |
|--------|----------|--|------------------|---|-----------------------------|-----------------------------|
| 1 | 32351202 | BSc (Hons) Mathematics Semester-II Differential Equations | 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. | 1 st April 2021 | 14 th April 2021 |
| | | | | Application of first order differential equations to acceleration-velocity model, Growth and decay model. | 15 th April 2021 | 3 rd May 2021 |
| | | | | 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 th May 2021 | 30 th May 2021 |
| | | | | 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 st June 2021 | 14 th June 2021 |
| | | | | Method of undetermined coefficients, Method of variation of parameters; Applications of second order differential equations to mechanical vibrations. | 15 th June 2021 | 29 th June 2021 |
| | | | | 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 th June 2021 | 14 th July 2021 |
| | | | | Revision | 15 th July 2021 | 2 nd August 2021 |

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|---|----------|---|------|--|--------------------------------|-----------------------------------|
| 2 | 32351202 | BSc (Hons) Mathematics Semester-II Differential Equations Practical | Core | Practical 1 & 2 | 01.04.21 | 14.04.21 |
| | | | | Practical 3&4 | 15.04.21 | 03.05.21 |
| | | | | Practical 5&6 | 17.05.21 | 30.05.21 |
| | | | | Practical 7&8 | 01.06.21 | 14.06.21 |
| | | | | Practical 9&10 | 15.06.21 | 30.06.21 |
| | | | | Practical 11&12 | 28.07.21 | 13.07.21 |
| | | | | Revision | 14.07.21 | 02.08.21 |
| 3 | 32355202 | BSc (Hons) Semester-II Linear Algebra | GE | Fundamental operation with vectors in Euclidean space R^n , Linear combination of vectors, dot product and their properties, Cauchy-Schwarz inequality, Triangle inequality, Projection vectors. | 1 st April 2021 | 14 th April 2021 |
| | | | | Some elementary results on vectors in R^n ; Matrices: Gauss–Jordan row reduction, Reduced row echelon form, Row equivalence, Rank. | | |
| | | | | Linear combination of vectors, Row space, Eigenvalues, Eigenvectors, Eigenspace, Characteristic polynomials, Diagonalization of matrices. Definition and examples of vector space, Some elementary properties of vector spaces. | 15 th April 2021 | 3 rd May 2021 |
| | | | | Subspace, Span of a set, a spanning set for an eigenspace, Linear independence and dependence, Basis and dimension of a vector space, Maximal linearly independent sets, Minimal spanning sets. | 17 th May 2021 | 30 th May 2021 |
| | | | | Application of rank: Homogenous and non-homogenous systems of linear equations; Coordinates of a vector in ordered basis, Transition matrix. Linear transformations: Definition and examples, Elementary properties. | 1 st June 2021 | 14 th June 2021 |
| | | | | The matrix of a linear transformation, Linear operator and similarity. Application: Computer graphics, Fundamental movements in a plane, Homogenous coordinates, Composition of movements | 15 th June 2021 | 29 th June 2021 |
| | | | | Kernel and range of a linear transformation, Statement of the dimension theorem and examples. One to one and onto linear transformations, Invertible linear transformations, isomorphism, isomorphic vector spaces | 30 th June 2021 | 14 th July 2021 |
| | | | | Orthogonal and orthonormal vectors, orthogonal and orthonormal bases, orthogonal complement, statement of the projection theorem and examples. Orthogonal projection onto a subspace. Application: Least square solutions for inconsistent systems, non-unique least square solutions. | 15 th July 2021 | 25 th July 2021 |
| | | | | Revision | 26 th July 2021 | 2 nd August 2021 |

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

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|--|--|----------|--|------|
| Event Topic | | | | |
| Type / Nature (FDP/Webinar/Workshop etc.) | | | | |
| Organizing In-charge | | | | |
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| Course Code | Course Name | Unique Paper Code | Topic Name | Day and Date | Date/s of Exhibiting the Assessment Sheet to students, Discussing the marks, Returning/Retaining |
|-------------|---|-------------------|---------------------------------|--|--|
| 563 | BSc (Hons) Mathematics Semester-II Differential Equations | 32351202 | Class Test on Unit 1 & Unit 2 | Monday 22 nd June 2021 | Monday 29 th June 2021 |
| 563 | BSc (Hons) Mathematics Semester-II Differential Equations | 32351202 | Assignment Unit 3 & 4 | Thursday 16 th July 2021 | Thursday 23 rd July 2021 |
| 567 | BSc (Hons) Semester-II Linear Algebra | 32355202 | Class Test on Unit 1 & Unit 2 | Friday 25 th June 2021 | Friday 2 nd July 2021 |
| 567 | BSc (Hons) Semester-II Linear Algebra | 32355202 | Assignment Unit 2 & 3 | Tuesday 21 st July 2021 | Tuesday 28 th July 2021 |
| 563 | BSc (Hons) Mathematics Semester-II Differential Equations Practical | 32351202 | Class Test on Practical 1 to 10 | Friday 17 th July 2021 | Friday 24 th July 2021 |

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

| Department/Society | Meeting Date | Purpose |
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I. College Functions

| College Function | Function Date | Role to be played |
|-------------------------|----------------------|--------------------------|
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