Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

Approved by Government of Tamil Nadu & Accredited by NAAC with 'A++' Grade (3rd Cycle-3.64 CGPA)

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DEPARTMENT OF MATHEMATICS

Board of Studies Meeting

The minutes of the 18th meeting of Board of Studies held on 07.11.2024 at 10.00 am at IQAC Board Room.

Members Present:

S. No.	Name	Category
1	**Dr. R. Sowrirajan** Head, Department of Mathematics Dr. N.G.P. Arts and Science College, Coimbatore	Chairman
2	**Dr. A. Ramesh babu** Assistant Professor (Sr. Grade) Department of Mathematics Amritha Viswa Vidyapeetham Coimbatore	Subject expert
3	**Dr. N. Balamani** Assistant Professor (SG), School of Physical and Computational Sciences Avinashilingam University Coimbatore.	Subject expert
4	**Mr. M. Santhosh Kumar,** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
5	**Dr. S. Gokilamani** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
6	**Dr. S. Kannaki** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
7	**Ms. R. Anandhi** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
8	**Mr. S. Rameshkumar** Dept of Mathematics,	Internal Member

	Dr. N. G. P. Arts and Science College Coimbatore	
9	**Mr. C. Sivakumar** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
10	**Ms. A. Thamilpriya** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
11	**Dr. S. Mathankumar** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
12	**Mr. D. Sundar** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
13	**Ms. M. Vinitha** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
14	**Dr. K. Kavitha** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
15	**Dr. R. Sindhu** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
16	**Dr. S.V. Arokia Pratheesha** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member
17	**Dr. N. Kuppuchamy** Dept of Tamil, Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member
18	**Dr. A. Hazel Verbina** Dept of English Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member
19	**Dr. K. Girija** Dept of Physics Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member

20	**Dr. V. Pream Sudha** Dept of CS with Data Analytics, Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member
21	**Dr. S. Uma** Dept of Computer Science Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member
22	**Mr. G. Sethuraman** Dept of Commerce with IT Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member
23	**Ms. S. K. Preethika** I M.Sc. Mathematics	Student representative
24	**Ms. D. K. Samyuktha** II B.Sc. Mathematics	Student representative

The HoD and Chairman of the Department of Mathematics welcomed and introduced all the members and appreciated them for their continuous support and contribution for the development of academic standard and enrichment of the syllabus.

Further Chairman informed the inability of the following members to attend the meeting and requested to grant leave of absence.

1. Dr. S. Narayanamoorthy, University Nominee
2. Mr. L. Madhan Mohan, Industry expert
3. Mr. P. Vijayakumar, Meritorious Alumni
4. Dr. M. Sangeetha, Internal Member
5. Dr. S. Manimekalai, Internal Member
6. Dr. P. Umamaheswari, Internal Member

The items of the agenda were taken one by one for discussion and the following resolutions were passed.

Item 18.1: *To review and approve the minutes of the previous meeting held on 04.04.2024*

The chairman of the Board presented the minutes of the previous meeting held on **04.04.2024** and requested the members to approve. After brief discussion the following resolution was passed.

Resolution:

Resolved to approve the minutes of the 17th meeting of BoS held on 04.04.2024

Item 18.2: *To consider and approve the syllabus for the II Semester for the students admitted in UG and PG from the academic year 2024-25*

The chairman presented the detailed syllabus for the II semester to the students admitted during the academic year 2024-2025. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

Course Code	Course	Changes and Reason
24MTP2CM	Computational Mathematics	As per the recommendation given by Dr. Rameshbabu the board decided to include programs that could demonstrate problems based on Mathematical methods.
24MTP2DC	Mathematical Finance	Dr. Balamani recommended to change the textbook by one authored by Goodman and Stampfli in order to give more financial market concepts through Mathematical concepts and hence the contents are framed based on the suggestions.

IDC Offered:

Course Code	Course	Department
24MTU2IA	Business Statistics	I B.Com. /I B.Com.(CA/PA/BA/BPS/IB/AT)
24MTU2IB	Mathematics for Management II	BBA(CA)
24MTU2IC	Discrete Mathematics	I B.Sc. (CS/IT/CT /BCA/CS(Cog))
24MTU2ID	Mathematics for Computing - II	I B.Sc. (CSDA/AI&ML/ Cyber security)
24MTU2IM	Statistical Analysis and Tools	B.Sc. Physics
24MTP2EA	Numerical Methods	M.Sc. Physics
24MTP2EB	Mathematical Physics	M.Sc. Medical Physics
24MTP2ED	Advanced Operations Research	M.Sc. Computer Science

Changes Made:

Course Code	Course	Changes and Reason
24MTU2IA	Business Statistics	Index Numbers is included as Unit V and the topics of Measures of central tendency and dispersion are rearranged as per the requisition from the Faculty of Commerce after the discussion with the external members.

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

Resolved to approve the above modifications and adopt the revised syllabus for the students admitted in UG and PG for the academic year 2024-2025.

Item 18.3: *To consider and approve the scheme and syllabus for the IV Semester for students admitted in UG and PG from the academic year 2023-24.*

The Chairman presented the detailed syllabi for the IV semester to the students admitted during the academic year 2023-2024. As per the discussion there are no changes in the syllabus and hence the same can be followed with new subject code for the academic year 2023-2024.

IDC Offered:

Course Code	Course	Department
232MT1A4IA	Business Statistics	II B.Com. (B&I /AT/ CSCA)
232MT1A4IB	Optimization Techniques	II B.Com. (BA/IB)
232MT1A4IC	Operations Research	II B.Sc. CS / II BCA
232MT1A4EP	Statistical Analysis and Tools	B.Sc. Chemistry

Changes Made:

Course Code	Course	Changes and Reason
232MT1A4IA	Business Statistics	Index Numbers is included as Unit V and the topics of Measures of central tendency and dispersion are rearranged as per the requisition from the Faculty of Commerce after the discussion with the external members

Resolution:

Resolved to approve the syllabus for the IV semester for the students admitted in UG and PG during the academic year 2023-2024.

Item 18.4: *To consider and approve syllabi for the VI Semester to the students admitted in UG from the academic year 2022-23.*

The Chairman presented the detailed syllabi for the VI semester for the students admitted during the academic year 2022-2023. As per the requirement of the current scenario and stake holder's feedback in the curriculum new courses are introduced. The details of changes made also presented as follows.

B. Sc. Mathematics:

Changes Made:

Course Code	Course	Changes and Reason
222MT1A6CB	Linear Algebra	Based on the suggestions of Dr.R.Rameshbabu, the contents of the syllabus are adapted from the book "Linear Algebra- A Geometric approach" by Kumaresan in which the concept are explained in the form of Geometrical structures for the better understanding of students.
222MT1A6SP	Linear Programming using Spread Sheet	As a requirement for DBT Star scheme, new programs involving biological systems such as birth-death rate, cancer development process are introduced to compute using Libre Office.
222MT1A6DB	Graph Theory	As per the suggestions given by Dr.R.Rameshbabu, the following changes were made in the syllabus: (i) Irregular graphs are included in unit I , (ii) powers and edge labelings are included in Unit III, (iii) Decision making through digraphs is included with applications in Unit IV (iv) Matchings and Planarity is introduced as Unit V instead of Colorings to give better understanding on the surface representation through graphs.
222MT1A6DE	Automata Theory and formal Languages	In order to give more importance to applications, Dr. N. Balamani suggested to frame the contents from the book "Theory of Computer Science" by Mishra and Chandrasekhar. The concepts of Pumping lemma for both regular language and context free languages are included.

New Courses Introduced:

Course Code	Course	Changes and Reason
222MT1A6CA	Complex Analysis	The expert members recommended to merge the Complex Analysis I and Complex Analysis II in to a single course and include the topics complex planes, Analytic functions, Conformal mappings and Complex integration that forms a basis for higher study.
222MT1A6EP	Fundamentals of Computing and Python Programming	Dr. Rameshbabu suggested to introduce computing methods to learners and frame the syllabus with programs that solves the Mathematical concepts of differential equations, numerical methods using Python.
222MT1A6DC	Mathematical Fundamentals in Pharmacokinetics	The external members discussed the merits of the course and recommended to include as this consists of various Mathematical concepts that forms basis for Pharmacokinetics.
222MT1A6DF	Mathematical models in Econometrics	The external members discussed in detail about the course and recommended to include the same as the students can be able to learn about Mathematical concepts that forms basis for Econometrics

Courses Removed:

Course Code	Course	Changes and Reason
192MT1A6CA	Real Analysis II	Shifted to fifth semester as core course
192MT1A6CP	R Programming	Shifted to fifth semester as skill course
192MT1A6DB	Astronomy II	Replaced with new course Mathematical Fundamentals in Pharmacokinetics
192MT1A6DC	Special Functions	Replaced with new course Mathematical models in Econometrics
192MT1A6DF	Number Theory	Shifted to fifth semester as core course

After discussion the following resolution was passed with the above changes and modifications.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for the students admitted in UG during the academic year 2022-2023.

Item 18.5: *To consider and approve the Diploma, Certificate, Skill oriented courses to be offered during the academic year 2024-25*

The Chairman presented the syllabus for the Value-Added Courses offered to the students of all disciplines.

    1.Applied Statistics and Management Techniques

    2.Data Analytics

The board members discussed in view of the job opportunities available and approved the syllabus.

Resolution:

Resolved to approve the syllabus for the Diploma, Certificate, Skill oriented courses to be offered during the academic year 2024-2025.

Item 18.6: *To review and approve the courses offered by NPTEL that are equivalent to courses that are offered in our curriculum in the III / V Semester.*

The Chairman presented the courses offered by NPTEL that are equivalent to courses that are offered in our curriculum in the III / V Semester during the academic year 2024-2025 and approved by the board.

Resolution:

Resolved to approve the courses offered by NPTEL that are equivalent to courses that are offered in our curriculum in the III / V Semester during the academic year 2024-2025.

Item 18.7: *To approve the Self-study papers offered in III Semester for UG and PG students.*

The Chairman presented Self-study papers offered in III Semester for UG and PG students.

B. Sc. Mathematics:

Course Code	Course Name
24MTUSSA	History of Mathematics
24MTUSSB	Introduction to Vedic Mathematics

M. Sc. Mathematics:

Course Code	Course Name
24MTPSSA	Research Methodology, IPR and Entrepreneurship
24MTPSSB	Mathematics of Bioinformatics

Resolution:

Resolved to approve Self-study papers offered in III Semester for UG and PG students.

Item 18.8: *To approve the panel of examiners for question paper setting and evaluation of answer scripts for the odd semester during the academic year 2024-2025.*

The Chairman presented the panel of examiners for question paper setting and evaluation of answer scripts for the odd semester during the academic year 2024-2025.

Resolution:

Resolved to approve the panel of examiners for question paper setting and evaluation of answer scripts for the odd semester during the academic year 2024-2025.

Item 18.9: *Any other Matter*

The chairman discussed about providing the skill-oriented course to provide practical knowledge on the various concepts like Calculus, trigonometry and differential equations. The board members accepted the same and suggested to provide Hands-on-training for this course using online resources.
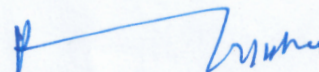
Resolution:

Resolved to approve the syllabus for the students admitted in UG and PG during the academic year 2024-2025.

Finally, the Chairman thanked all the members for their cooperation and contribution in enriching the syllabus with active participation in the meeting and sought the same spirit in the future also. The meeting was closed with formal vote of thanks proposed by the chairman.

Date: 07.11.2024

(Dr.R.Sowrirajan)
RoS Chairman/HoD
Department of Mathematics
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: 222MT1A6CA /COMPLEX ANALYSIS

Unit	Content
I	**Complex plane:** Representation of complex numbers - roots - angle between two rays – equations of straight lines and circles – elementary transformation – Infinity and extended complex Plane – Stereographic projection- closed sets – open sets – theorems on bounded Infinite sets - examples
II	**Analytic functions:** Complex functions - limits – continuity – uniform continuity – differentiability and analyticity – necessary and sufficient conditions for differentiability – C-R equation in Polar coordinates - complex function as a function of z and conjugate – examples
III	**Power Series:** Power series - absolute and uniform convergence - analyticity of Power Series –representation of a function by power series- elementary functions -exponential functions – Logarithmic functions and function a^z - Branch point – trigonometric, hyperbolic and harmonic functions – examples.
IV	**Elementary and Conformal mappings:** Bilinear transformation – special Bilinear transformations – Circles and inverse points- transformations $w = z^2$, $w = \sqrt{z}$, $w = e^z$, $w = \frac{z+1}{z}$, $w = \log z$, $w = \sin z$ and $w = \cos z$ -conformal z mappings – examples
V	**Complex Integration:** Simple Rectifiable oriented curves – integration of Complex functions –definite Integrals – Interior and Exterior of closed curve - simply connected region – Cauchy's fundamental theorem – Integral along an arc joining two points - Cauchy's integral formula and formula for derivatives -zeros - related integral theorem – term by term differentiation and integration – examples.

PERCENTAGE OF SYLLABUS REVISED: 100%
COURSE FOCUSES ON

- ☑ Skill Development
- ☐ Entrepreneurial Development
- ☑ Employability
- ☐ Innovations
- ☐ Intellectual Property Rights
- ☐ Gender Sensitization
- ☐ Social Awareness/ Environment
- ☐ Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: 222MT1A6CB /LINEAR ALGEBRA

Unit	Existing	Changes
I	**Linear Equations and Vector Spaces:** ~~Fields~~ – System of linear equations – ~~Matrices and Elementary row operations – Row reduced echelon matrices – Matrix multiplication – Invertible matrices~~ – Vector spaces – Subspaces – Bases and dimensions – ~~Coordinates – Summary – Computations concerning subspaces.~~	line - quotient spaces
II	**Linear Transformations:** Linear transformations – ~~Algebra of linear transformations – Isomorphism – Representation by matrices – Linear functional – Double dual – Transpose of a linear transformations.~~	Linear transformations – representation of linear maps by matrices - kernel and image – linear isomorphism - geometric ideas and some loose ends - some special linear transformations.
III	~~**Polynomials:**~~ ~~The algebra of polynomials – Lagrange interpolation – Polynomial ideals – The prime factorization of a polynomial.~~	**Inner Product Spaces** Inner product spaces - orthogonality - some geometric applications - orthogonal projection into a line- orthonormal basis - orthogonal complements and projections.
IV	**Determinants:** ~~Commutative rings – Determinant functions- Permutations and the uniqueness of determinants – Additional properties – Modules.~~	2X2 determinant as area of parallelogram - properties - computation - basic results - orientation and vector product.
V	~~**Elementary Canonical Transforms :**~~ ~~Introduction – Characteristic values – Annihilating polynomials - Invariant subspaces.~~	**Diagonalization and Classification of Quadrics** Rotation of axis of conics - Eigen values and Eigen vectors – diagonalization of symmetric matrices- conics and quadrics – computational examples.

PERCENTAGE OF SYLLABUS REVISED: 90%
COURSE FOCUSES ON:

✓	Skill Development	☐	Entrepreneurial Development
✓	Employability	☐	Innovations
☐	Intellectual Property Rights	☐	Gender Sensitization
☐	Social Awareness/ Environment	☐	Constitutional Rights/ Human Values/ Ethics

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: **222MT1A6EP / FUNDAMENTALS OF COMPUTING AND**

PYTHON PROGRAMMING

Unit	Content
I	**Computational Thinking and Introduction to Python:** Fundamentals of Computing – identification of computational problems - algorithms, logical and algorithmic thinking - defining the problem - devising the solution -decomposition - the way of the program. 1. Write an algorithm to add two numbers by a user 2. Write an algorithm to find all roots of a quadratic equation $ax^2+bx+c=0$ 3. Write a program for transpose of a matrix 4. Write a program to find the distance between two points 5. Write a program to find the cubic root of given equations
II	**Variables, Expressions and Statements:** Values and types – variables - variable names and keywords – statements - operators and expressions - order of operations - string operations - debugging. 6. Write a program for addition and subtraction of complex numbers 7. Write a program to check for finding vertex, focus and directrix of a parabola 8. Write a program to find the smallest root of the equation $x^2 + s(x)*x - n = 0$, where $s(x)$ is the sum of digits of root [x] 9. Write a program to calculate surface area and volume of a cylinder using local and global variables
III	**Control Flow, Functions and Strings:** Function definition - function call - flow of execution - parameters and arguments - return values - local and global scope – recursion. Conditionals: Boolean values and operators - conditional(if) - alternative (if-else) - chained conditional (if-elif-else) - Iteration: state, while, for, break, continue, pass. Fruitful functions: return values - function composition - boolean functions – recursion. Strings: string slices – immutability - string functions (looping and counting) and methods - string comparison. 10. Write a program to solve for system of linear equations (n linear equations as input using augmented matrix method) 11. Write a program to print a pattern using recursion 12. Write a program to find the area of Tetrahedron using functions with parameters 13. Write a program to compute the value of $x^3 + 6x^2+2x- 1$ for x=3
IV	**Lists, Dictionaries and Tuples:** Lists: list operations - list slices - list methods - list loop – mutability – aliasing - list arguments. Dictionaries: Dictionary as a set of counters - looping and dictionaries - reverse lookup - dictionaries and lists. Tuples: tuple assignment - tuple as return value - lists and tuples - dictionaries and tuples. 14. Write a program to find the complex root of the equation $x^2+1=0$ by Newton's methods 15. Write a Python program to generate (given an integer n) a square matrix filled with elements from 1 to n raised to the power of 2 in spiral order 16. Given an array of names of candidates in an election. A candidate name in the array represents a vote cast to the candidate. Using Dictionary, write a program to print the name of candidates

	received Max vote. If there is tie, print a lexicographically smaller name 17. Write a program to draw a circle using polar equation and Bresenham's equation
V	**Files:** Persistence - reading and writing - format operator - filenames and paths - catching exceptions – databases – pickling – pipes - writing modules. 18. Write a program to convert a text file with math problems to a text file with the answers to those problems 19. Write a program to check whether the file exists or not 20. Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file

PERCENTAGE OF SYLLABUS REVISED: 100%
COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: 222MT1A6SP / LINEAR PROGRAMMING USING SPREADSHEET

Program	Existing	Changes
1	~~Formulation of linear programming problem using LibreOffice Calc~~	Give Mathematica Formulation in the form of a linear programming for a biological system with qualitative data with LibreOffice Calc
2	~~Solve linear programming problem using LibreOffice Calc~~	Solve for maximization of a Linear Programming (LP) problem representing a Biological system using Simplex method in LibreOffice Calc
3	~~Solve simplex problem using LibreOffice Calc~~	Solve for minimization of a Linear Programming (LP) problem representing a Biological system using Simplex method in LibreOffice
4	Obtain a solution for quadratic programming problem	
5	Solve integer programming problem using LibreOffice Calc	

6	Obtain a solution for goal programming problem		
7	Solve balanced transportation problem using LibreOffice Calc		
8	Obtain a solution for unbalanced transportation problem		
9	Solve balanced assignment problem using LibreOffice Calc		
10	Obtain a solution for unbalanced assignment problem		
11	~~Solve queuing problems using LibreOffice Calc~~	Solve a queueing model that represents a Birth-Death Biological Process Using LibreOffice Calc	
12	~~Find the shortest route using LibreOffice Calc~~	Compute the shortest route through a "working backward" approach for a model in Mathematical Biology using LibreOffice Calc	
13		Compute the value of the game using LibreOffice Calc	
14		Identify the best decision for a problem representing cancer development process using LibreOffice Calc	
15		Compute inventory cost using libre office Calc	

PERCENTAGE OF SYLLABUS REVISED: 50%
COURSE FOCUSES ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	☐	Innovations
☐	Intellectual Property Rights	☐	Gender Sensitization
☐	Social Awareness/ Environment	☐	Constitutional Rights/ Human Values/ Ethics

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: 222MT1A6DB / GRAPH THEORY

Unit	Existing	Changes
I	**Introduction of Graphs** Graphs and Graph Models - Connected graphs - Common classes of graphs - Multi graphs and digraphs - The degrees of a vertex - Regular graphs - Degree sequences - Excursion: graphs and matrices.	Irregular graphs
II	**Isomorphic Graphs** The definition of Isomorphism - Isomorphism as a relation - Excursion: Graphs and groups - Reconstruction and solvability.	
III	**Trees and Connectivity** Bridges - Trees - The minimum spanning tree problem - Excursion: the number of spanning trees - Cut - Vertices - Blocks - Connectivity - Menger's theorem.	powers and edge labelings
IV	**Traversability and Digraphs** Eulerian Graphs - Hamiltonian graphs - Hamiltonian walks - Strong digraphs -Tournaments - Exploration: wine bottle problems.	Decision making
V	**Coloring of Graphs** The four color problem - Vertex coloring - Edge coloring - Excursion: The Heawood map coloring theorem - Exploration: modular coloring.	**Matching, Factorization and Planarity:** Matchings - factorization - decomposition and graceful labelings - Peterson graphs -Planar graphs - embedding graphs on surfaces.

PERCENTAGE OF SYLLABUS REVISED: 30%
COURSE FOCUSES ON:

✓	Skill Development	☐ Entrepreneurial Development
✓	Employability	☐ Innovations
☐	Intellectual Property Rights	☐ Gender Sensitization
☐	Social Awareness/ Environment	☐ Constitutional Rights/ Human Values/ Ethics

Faculty: BAS **Board: Mathematics** **Semester: VI**

Course Code/ Name: 222MT1A6DC / Mathematical Fundamentals in Pharmacokinetics

Unit	Content
I	**Pharmaceutical calculations:** Percent- ratio - proportion, variation- dimensional analysis - alligation – significant figures –rules for rounding - estimation.
II	**International Systems of Units and Pharmaceutical Measurements:** Guidelines - special considerations-measure of length - volume- weight-prescription writing style using the SI - Pharmaceutical measurements: measurement of volume and weight, Aliquot method - least weighable quantity method - percentage of error.
III	**Fundamentals in Pharmacokinetics:** Calculus – mathematical expressions and units – units for expressing blood concentrations – measurement and use of significant figures - graphs - curve fitting- linear regression/least squares method - rates and order of processes - problems.
IV	**Biostatistics:** Variables – types of data – distributions –central tendency and variability - hypothesis testing - statistically versus clinically significant differences – statistical inference techniques in hypothesis testing for parametric and nonparametric data - goodness of fit – control versus non-control studies – blinding – confounding – validity – bioequivalence studies – evaluation of risk for clinical studies.
V	**Empirical and Mechanistic Models, Statistical Moments and Noncompartmental Analysis** Empirical models - mechanistic models - non compartmental analysis – comparison of different approaches - selection of pharmacokinetic models.

PERCENTAGE OF SYLLABUS REVISED: 100%
COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: 222MT1A6DE / AUTOMATA THEORY AND FORMAL LANGUAGES

Unit	Existing	Changes
I	**Finite Automata:** Three basic concepts-Applications-Deterministic and Nondeterministic Finite accepters-equivalence of Deterministic and Nondeterministic Finite accepters-reduction of the number of states	Transition system - minimisation
II	**Regular Languages and Properties:** Regular expressions-Connection between regular Expressions and Regular Languages-Regular Grammars-Closure properties -Elementary questions - Identifying Nonregular languages	Chomsky classification, Pumping lemma for regular sets, recursive and recursively enumerable sets
III	**Context Free Languages:** Context-Free grammars - Parsing and Ambiguity-Context-Free Grammars and programming languages-Methods for Transforming Grammars	
IV	**Normal Forms and Pushdown Automata:** Two normal forms - Membership Algorithm-Nondeterministic Pushdown automata- Pushdown automata and Context-Free languages- Deterministic Pushdown Automata and Deterministic context-free languages- Grammars for Deterministic context-free languages	Top-down and Bottom-up parsing by pda
V	**Properties of Context-Free Languages:** Two Pumping Lemmas- Closure properties and decision algorithms for context-free languages	

PERCENTAGE OF SYLLABUS REVISED: 20%
COURSE FOCUSES ON:

- [✓] Skill Development
- [ ] Entrepreneurial Development
- [✓] Employability
- [ ] Innovations
- [ ] Intellectual Property Rights
- [ ] Gender Sensitization
- [ ] Social Awareness/ Environment
- [ ] Constitutional Rights/ Human Values/ Ethics

Syllabus (New Course)

Faculty: BAS   **Board: Mathematics**   **Semester: VI**

Course Code/ Name: 222MT1A6DF / MATHEMATICAL MODELS IN ECONOMETRICS

Unit	Content
I	**Econometrics, Economic Data and Regression model:** Definition – steps in developing an econometric model - economic data – simple regression model – ordinary least squares – characteristics – units of measurement and functional form – assumptions and statistical properties.
II	**Comparative Statics, Derivative and Dynamic Analysis:** Nature - rate of change and derivative - slope of the curve - rules of differentiation and their use in comparative statics - comparative statics of general function models - dynamic analysis - economic applications - Domar growth model.
III	**Continuous Time:** First order linear differential equations – dynamics of market price – variable coefficients and variable term – Higher order differential equations: second order linear differential equations – market model with price expectations - interaction of inflation and unemployment.
IV	**Discrete Time:** Discrete Time – differences and difference equations - first order difference equations -dynamic stability - Cobweb model - market model with inventory - second order linear difference equation - Samuelson multiplier acceleration interaction model - inflation and unemployment.
V	**Dynamic systems and Optimal Control Theory:** Genesis of dynamic systems - solving simultaneous dynamic equations – dynamic input – output model. Optimal Control Theory: Nature of optimal control – alternative terminal conditions – autonomous problems - economic applications.

PERCENTAGE OF SYLLABUS REVISED: 100%
COU RSE FOCUSES ON:

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: BAS   **Board:** Mathematics   **Semester:** II

Course Code/ Name: 24MTP2DC / MATHEMATICAL FINANCE

Unit	Existing	Changes
I	**Options and Arbitrage:** Introduction - stock options -profit and payoff curves - time value - selling short - Forward contracts- futures contracts - Put-Call option parity formula - comparing option prices.	
II	**Discrete Time Pricing Models:** Assumptions - basic model - portfolio and trading strategies - preserving gains - Arbitrage trading strategies - martingale measure - characterizing Arbitrage - computing martingale measure - alternatives and replication - uniqueness of martingale measure - general and standard Binomial model.	Discrete and continuous model — Trees and Continuous models.
III	**Optimal Stopping and American Options:** An example - the model - Payoff process - stopping times - existence - snell envelope - smallest dominating super martingale - additional facts - Optimal stopping time and Doob decomposition - smallest and largest optimal stopping time	
IV	**Continuous Probability:** Probability spaces - Probability measures - distribution and density functions - random variables - normal distribution - convergence - central limit theorem.	Unit IV Interest Rate models: Interest rates and forward rates – Zero-coupon bonds – Swaps – Pricing and hedging a swap- Interest Rate models.
V	**Black Scholes Option Pricing formula:** Stock prices and Brownian motion - Binomial model in the limit - natural Binomial model - martingale measure Binomial model - Black-Scholes option pricing formula - Volatility smiles - dividend's effect in Black-Scholes formula - Ito's lemma.	Unit V Pricing Bonds: Bond price dynamics – Bond price formula – spot rate -The HJM miracle – Tree models for bond prices - a Binomial Vasicek model.

PERCENTAGE OF SYLLABUS REVISED: 40%
COURSE FOCUSES ON:

☑	Skill Development	☐	Entrepreneurial Development
☑	Employability	☐	Innovations
☐	Intellectual Property Rights	☐	Gender Sensitization
☐	Social Awareness/ Environment	☐	Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: BAS   **Board: Mathematics**   **Semester: II**

Course Code/ Name: 24MTP2CM / COMPUTATIONAL MATHEMATICS

Unit	Existing	Changes
I	**LATEX: Basics and Basic Typesetting:** Introduction to LATEX: Pros and Cons – basics - document hierarchy – document management - labels and cross - references - bibliography - table of contents and lists of things - class files – packages - errors and troubleshooting. Running text: Special characters– abbreviations – alignment. 1. Creating a Latex document with Mathematical formulas 2. Creating a Latex document with proper justification 3. Create a bibliography using Latex	
II	**LATEX: Tables, Diagrams, and Data Plots:** Presenting External Pictures: Figure environment - special packages - external picture files - graphicx package - setting default key values - setting a search path - graphics extensions. Presenting Diagrams: tikzpicture Environment - \tikz command - grids - paths - coordinate labels - extending paths - actions on paths - nodes and node labels - spy library – trees – logic circuits – commutative diagrams – option – styles. 4. Creating a Latex document with table, graph or picture 5. ~~Designing the power point presentation using Latex~~ 6. ~~Creating a simple project using Latex~~	5. Create a question paper using Latex 6. Create a simple beamer presentation 7. Create a one-page curriculum vitae in Latex 8. Rewrite a research article in the form of LATEX document

III	**MATLAB: Introduction and Iterative Computation:** Introduction: Basics of MATLAB. Iterative Computation: Matrices and vectors – matrix and array operations – character strings - command line functions – using build-in functions and on-line help - saving and loading data – plotting simple graph. 7. Create a simple MATLAB program using arithmetic operators 8. Write MATLAB code with matrix operations 9. Write MATLAB code for finding the results of the students in exam	
IV	**MATLAB: Graphics & Errors:** Graphics: Basic 2-D plots – 3-D plots – handle graphics – saving and printing graphs – animation. Errors 10. Designing a simple plot and multiple plots in a single window 11. Designing a bar chart and phi chart 12. Designing a 3D plot	
V	**MATLAB: Applications:** Algebraic equations: Linear Algebra - nonlinear algebraic equations. Data analysis and regression: Curve fitting and regression analysis – correlations - statistics. Differential equations: Numerical integration – solution of ODEs for initial value problems - solution of ODEs for boundary value problems – advanced topics. 13. Solving a first order differential equation using Euler's method and Runge-Kutta fourth order method 14. Solve the wave and heat equations 15. ~~Solve a simple equation using Newton Raphson Method~~	17. Write a MATLAB program to find minimum and a maximum value of a given function. 18. Solve simple integral equations with boundary values. 19. Find the eigen values and eigen vectors of the system of equations. 20. Solve numerical integration problems using Simpson's 1/3 rule, Trapezoidal rule and Romberg's method.

PERCENTAGE OF SYLLABUS REVISED: 40%
COURSE FOCUSES ON:

✓	Skill Development	☐	Entrepreneurial Development
✓	Employability	☐	Innovations
☐	Intellectual Property Rights	☐	Gender Sensitization
☐	Social Awareness/ Environment	☐	Constitutional Rights/ Human Values/ Ethics

Syllabus Revision

Faculty: BAS   **Board: Mathematics**   **Semester: II/IV**

Course Code/ Name: 24MTU2IA/222MT1A4IA – BUSINESS STATISTICS

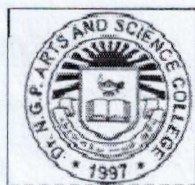| Unit	Existing	Changes
I	**Measures of Central Tendency:** Introduction- arithmetic mean- median - mode - comparison of the mean, median and mode - geometric mean- harmonic mean.	Introduction- importance - range - interquartile range - interfractile range - mean deviation- standard deviation- relative dispersion- co-efficient of variation.
II	~~**Measures of Dispersion:** Introduction- importance- range- interquartile range- interfractile range - mean deviation- standard deviation- relative dispersion- co-efficient of variation.~~	
III	**Probability:** Introduction - Probability theory - basic terminologies - three types - axioms - conditions of statistical independence and dependence - Baye's theorem.	
IV	**Correlation and Regression Analysis:** Concept and importance - correlation and causation - types - graphic and algebraic methods - coefficient of determination - rank correlation - some limitations - regression model - estimation using the regression line - method of least squares - alternative approach - regression co-efficient.	
V	**Time Series Analysis and Forecasting:** Introduction - components of a time series- trend - seasonal variation - cyclical variation - irregular variation - forecasting.	Introduction - uses - index number construction - types - time reversal, factor reversal and circular tests - chain base index numbers - splicing and shifting the base – deflating prices and incomes - quantity and value index numbers - caution in using index numbers.

PERCENTAGE OF SYLLABUS REVISED: 20%

COURSE FOCUSES ON:

✓	Skill Development	☐	Entrepreneurial Development
✓	Employability	☐	Innovations
☐	Intellectual Property Rights	☐	Gender Sensitization
☐	Social Awareness/ Environment	☐	Constitutional Rights/ Human Values/ Ethics

Dr. N.G.P. ARTS AND SCIENCE COLLEGE

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18th
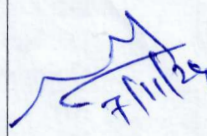
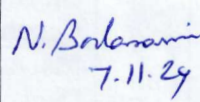## ATTENDANCE OF THE EIGHTEENTH BOARD OF STUDIES MEETING

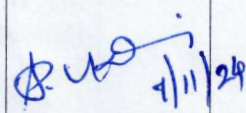**Faculty: Basic and Applied Sciences**   **Board: Mathematics**
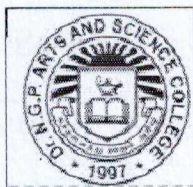
Date   :   07/11/2024
Time   :   10.00 a.m.
Venue   :   IQAC Board Room

S.No	Name and address	Designation	Signature
1	**Dr. R. Sowrirajan** Head, Department of Mathematics Dr.N.G.P.Arts and Science College, Coimbatore	Chairman	
2	**Dr. S. Narayanamoorthy** Associate Professor Department of Mathematics Bharathiar University Coimbatore	VC Nominee	ABSENT
3	**Dr. A. Ramesh babu** Assistant Professor (Sr. Grade) Department of Mathematics Amritha Viswa Vidyapeetham Coimbatore	Subject expert	7/11/24
4	**Dr. N. Balamani** Assistant Professor (SG), School of Physical and Computational Sciences, Avinashilingam University	Subject expert	N. Balamani 7.11.24
5	**Mr. L. Madhan Mohan** Team Leader Software Projects Daivel Software Solutions Coimbatore	Industry expert	ABSENT
6	**Mr. P. Vijayakumar** Junior Revenue Inspector Collectorate The Nilgiris	Meritorious Alumni	ABSENT
7	**Dr. P. Umadevi** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	7/11/24
8	**Dr. M. Sangeetha** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	ABSENT

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9	Mr. M. Santhosh Kumar, Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
10	Dr. S. Gokilamani Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
11	Dr. S. Manimekalai, Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	ABSENT
12	Dr. S. Kannaki Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
13	Ms. R. Anandhi Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
14	Mr. S. Rameshkumar Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
15	Mr. C. Sivakumar Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
16	Ms. A. Thamilpriya Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
17	Dr. S. Mathankumar Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
18	Dr. P. Umamaheswari Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	ABSENT
19	Mr. D. Sundar Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	
20	Ms. M. Vinitha Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	

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22	**Dr. R. Sindhu** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	R. Sindh 7/11/2024
23	**Dr. S.V. Arokia Pratheesha** Dept of Mathematics, Dr. N. G. P. Arts and Science College Coimbatore	Internal Member	7/11/24
24	**Dr. N. Kuppuchamy** Dept of Tamil, Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member	
25	**Dr. A. Hazel Verbina** Dept of English Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member	
26	**Dr. K. Girija** Dept of Physics Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member	7/11/24
27	**Dr. V. Pream Sudha** Dept of CS with Data Analytics, Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member	
28	**Dr. S. Uma** Dept of Computer Science Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member	7/11/24
29	**Mr. G. Sethuraman** Dept of Commerce with IT Dr. N. G. P. Arts and Science College Coimbatore	Co-opted Member	G. Sethuraman
30	**Ms. S. K. Preethika** I M.Sc. Mathematics	Student representative	S.K.Preethika
31	**Ms. D. K. Samyuktha** II B.Sc. Mathematics	Student representative	D. K. Samyuktha

Date: 07/11/2024

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(Dr. R. Sowrirajan)

BoS Chairman/HoD
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