KONGU ARTS AND SCIENCE COLLEGE

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

ERODE – 638 107

B.Sc (Mathematics)

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2018-2019

KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS), ERODE –638 107

B.Sc. MATHEMATICS

(For the candidates admitted during the academic year 2017 – 2018 and onwards)

SCHEME OF EXAMINATION – CBCS PATTERN

Part	Course Code	Course	Hrs/Week	T/P	Exam Duration	CIA	ESE	Total Marks	Credits
SEMESTER I									
I	17T01/17H01/ 17M01/17F01/ 17S01	Language – I	6	T	3	25	75	100	4
II	17E01	English – I	6	T	3	25	75	100	4
III	17UANCT101	Core Paper I – Algebra and Trigonometry	4	T	3	25	75	100	4
III	17UANCT102	Core Paper II – Differential and Integral Calculus	5	T	3	25	75	100	4
III	17UANAT103	Allied Paper I – Allied Physics –I	4	T	3	20	55	75	3
		Allied Paper I – Physics Practical	3	P	-	-	-	-	-
IV	17ES01	Foundation Course I : Environmental Studies #	2	T	3	-	50	50	2
		Total						525	21
SEMESTER II									
I	17T02/17H02/ 17M02/17F02/ 17S02	Language – II	6	T	3	25	75	100	4
II	17E02	English – II	6	T	3	25	75	100	4
III	17UANCT201	Core Paper III - Analytical Geometry	4	T	3	25	75	100	4
III	17UANCT202	Core Paper IV- Theory of Equations, Vector Calculus and Fourier Series	5	T	3	25	75	100	4
III	17UANAT203	Allied Paper II – Allied Physics –II	4	T	3	20	55	75	3
	17UANAP204	Allied Paper II – Physics Practical	3	P	3	20	30	50	2
IV	17VE01	Foundation Course II : Value Education #	2	T	3	-	50	50	2
		Total						575	23
SEMESTER III									
I	17T03/17H03/ 17M03/17F03/ 17S03	Language – III	6	T	3	25	75	100	4
II	17E03	English – III	6	T	3	25	75	100	4
III	17UANCT301	Core Paper V- Differential Equations and Laplace Transforms	4	T	3	25	75	100	4
III	17UANCT302	Core Paper VI - Discrete Mathematics	4	T	3	25	75	100	4
III	17UANAT303	Allied Paper III: Statistics for Mathematics - I	5	T	3	25	75	100	4
IV	17UANSP304	Skill Based Subject I: Statistical Programming Language R	3	P	3	20	55	75	3
IV	17BT01/ 17AT01/ 17UANNT305	Basic Tamil@ / Advanced Tamil# (OR) Non Major Elective I *	2	T	3	75		75	2
		Total						650	25

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SEMESTER IV									
I	17T04/17H04/ 17M04/17F04/ 17S04	Language – IV	6	T	3	25	75	100	4
II	17E04	English – IV	6	T	3	25	75	100	4
III	17UANCT401	Core Paper VII- Mechanics	4	T	3	25	75	100	4
III	17UANCT402	Core Paper VIII- Operations Research	4	T	3	25	75	100	4
III	17UANAT403	Allied Paper IV – Statistics for Mathematics - II	5	T	3	25	75	100	4
IV	17UANSP404	Skill Based Subject II: Introduction to Scientific Computing - OCTAVE	3	P	3	20	55	75	3
IV	17BT02/ 17AT02/ 17UANNT405	Basic Tamil @ /Advanced Tamil # (OR) Non Major Elective II *	2	T	3	-	75	75	2
		Total						650	25
SEMESTER V									
III	17UANCT501	Core Paper IX-Real Analysis-I	6	T	3	25	75	100	4
III	17UANCT502	Core Paper X- Complex Analysis-I	6	T	3	25	75	100	4
III	17UANCT503	Core Paper XI- Abstract Algebra	6	T	3	25	75	100	4
III	17UANCT504	Core Paper XII- Programming in C	6	T	3	25	75	100	4
III	17UANEP505/ 17UANEP506/ 17UANEP507	Elective I	3	P	3	40	60	100	3
IV	17UANST508	Skill Based Subject III: Mathematics For Competitive Examinations	3	T	3	20	55	75	3
IV	17UANIT01	Institutional Training $	Completed / not Completed						
		Total						575	22
SEMESTER VI									
III	17UANCT601	Core Paper XIII: Real Analysis-II	6	T	3	25	75	100	4
III	17UANCT602	Core Paper XIV : Complex Analysis-II	6	T	3	25	75	100	4
III	17UANCT603	Core Paper XV : Linear Algebra	6	T	3	25	75	100	4
III	17UANET604/ 17UANET605 17UANET606	Elective II	5	T	3	25	75	100	4
III	17UANET607/ 17UANET608/ 17UANET609	Elective III	5	T	3	25	75	100	4
IV	17UANSV610	Skill Based Subject IV: Project	2	-	-	20	55	75	3
V	17NS01/17NC01/ 17PE01/17YR01	Extension Activities	-	-	-	-	-	50	1
		Total						625	24
		Total						3600	140

@ Only Continuous Internal Assessment (CIA).

Only End Semester Examinations (ESE).

$ Students have to go for teaching practice as an Institutional Training for 15 days and the training report has to be submitted. Completion of training is mandatory to get a degree.

* Courses offered to other Departments, only End Semester Examinations (ESE).

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**** GUIDELINES FOR PROJECT WORK**

- Students are divided into groups.
- A supervisor has been allotted to each group by the department.
- The group can select the broad field and the topic of the project by discussing with the respective supervisor.
- Each group should maintain a work diary wherein weekly work carried out has to be written which will be reviewed by the supervisor.
- A minimum of three reviews have to be done.
    - In the first review, the group has to submit the basic materials which are needed for the project.
    - During the second review, the progress of the project will be monitored.
    - In the final review, the group has to submit the rough copy of the project.
- They should be asked to present the work done to the respective supervisor during the reviews.
- The group should submit a rough copy of the project to their supervisor before the final copy.
- The work diary along with project report should be submitted at the time of viva – voce examination.

CIA Marks Distribution:

The supervisor will give the marks for CIA as per the norms stated below:

First Review	5 Marks
Second Review	5 Marks
Final Review	5 Marks
Attendance	5 Marks
Total	20 Marks

End Semester Examination:

The evaluation for the End Semester Examination should be as per the norms given below:

Project Report	40 Marks
Viva-Voce Examination	15 Marks (Jointly given by the External and Internal Examiner)
Total	55 Marks

S.No.	List of Allied Courses
1.	Allied Physics –I
2.	Allied Physics –II
3.	Statistics for Mathematics - I
4.	Statistics for Mathematics -II

S.No.	List of Skill Based Courses
1.	Statistical Programming Language R
2.	Introduction to Scientific Computing - OCTAVE
3.	Mathematics for Competitive Examinations
4.	Project

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S.No.	Course Code	List of Non Major Elective Courses
1.	17UANNT305	Decision Making Techniques
2.	17UANNT405	Statistical Methods

List of Electives Courses		
Elective –I	17UANEP 505	RDBMS and ORACLE Practical
	17UANEP 506	Programming in C Practical
	17UANEP 507	Visual Basic Practical
Elective –II	17UANET 604	Numerical Methods
	17UANET 605	Formal Languages and Automata Theory
	17UANET 606	Fuzzy Sets and Fuzzy Logic
Elective - III	17UANET 607	Elementary Number Theory
	17UANET 608	Neural Networks and Genetic Algorithm
	17 UANET 609	Elementary Graph Theory

Advanced Learners Courses		
S.No.	**Course Code**	**Course**
1.	17UANAL406	Vedic Mathematics
2.	17UANAL407	Financial Mathematics
3.	17UANAL509	Mathematical Modelling
4.	17UANAL510	Simulation

This course is offered to the UG students who have no standing arrears and secured 7.5 and above CGPA upto previous Semester in Part – III only.

- The students can choose any one of the above mentioned courses.
- Only **External** Assessment for **100 Marks.**
- **2 Credits** allotted for ALC.
- This course is purely a **Self Study Course** and will not be considered for computation of Cumulative Grade Point Average (CGPA).

Total Marks: 3600
Total Credit: 140

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PRINCIPAL,
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Dr.S.Nagarajan
Chairman
Board of Studies - Mathematics

Sem	Course Code	Skill Based Subject - I	Total Marks:75		Hours Per Week	Credits
III	17UANSP304	STATISTICAL PROGRAMMING LANGUAGE R	CIA: 20	ESE :55	3	3

OBJECTIVE:

To enable the students to get practice on different statistical techniques using -R software.

COURSE OUTCOME:

On successful completion of the course, the students will able to

CO1 calculate measures of central tendency and measures of dispersion.
CO2 determine various parameters of theoretical distributions.
CO3 solve the statistic 't' by constructing hypothesis.
CO4 determine the Correlation and Regression Coefficients.
CO5 solve the statistical hypothesis by Chi - Square Test.

LIST OF EXPERIMENTS:

1. Write a program to calculate of Measures of Central Tendency.
2. Write a program to calculate of Measures of Dispersion.
3. Write a program to display graphical of data.
4. Write a program to analyse data using Tables.
5. Write a program to calculate binomial, normal and Poisson distributions.
6. Write a program to calculate one sample t-test.
7. Write a program to calculate independent sample t-test.
8. Write a program to calculate dependent sample t-test.
9. Write a program to calculate partial correlation.
10. Write a program to calculate rank correlation.
11. Write a program to calculate linear regression.
12. Write a program to calculate Chi - Square test of independence.

BOOKS FOR REFERENCE:

1. Mark Gardener, "Beginning R-The Statistical Programming Language", Wiley Publications, UK, 2015.
2. W.John Braun and Duncan J.Murdoch, "A First Course in Statistical Programming with R", Cambridge University Press, New York, 2007.

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Sem	Course Code	Non Major Elective - I	Total Marks: 75	Hours Per Week	Credits
III	17UANNT305	DECISION MAKING TECHNIQUES	ESE : 75	2	2

OBJECTIVE:

To enable the students to understand the concept of Transportation Model, Assignment Problem, Critical Path Analysis and Game Theory.

COURSE OUTCOME:

On successful completion of the course, the students will able to

CO1 solve transportation problem using different methods.

CO2 solve the assignment problem.

CO3 construct network diagrams and its computations.

CO4 distinguish between PERT and CPM.

CO5 analyze maximin and minimax strategies.

UNIT-I

Transportation Model: Introduction - Mathematical formulation of a Transportation Problem - Methods for finding initial basic feasible solution using NWC and LCM (Balanced Cases only).

UNIT II

Assignment Problem: Introduction - Mathematical Formulation of an Assignment Problem - Hungarian Method for solving Assignment Problem (Balanced Cases only).

UNIT III

Scheduling by PERT and CPM: Introduction - Basic Terminologies - Rules for constructing a project network - Network Computations.

UNIT IV

Scheduling by PERT and CPM (continued): Programme Evaluation and Review Technique - Basic difference between PERT and CPM.

UNIT V

Game Theory: Introduction - Two people Zero - sum games - The Maximin - Minimax Principle-Games without saddle points, Mixed Strategies.

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TEXT BOOK:

V.Sundaresan, K.S.Ganapathy Subramanian and K.Ganesan, "Resource Management Techniques", A.R Publications, Revised Edition , Arpakkam, Nagapattinam , 2000.

UNIT I : Chapter 7 : Section 7.1.

UNIT II : Chapter 8 : Sections 8.1 - 8.5.

UNIT III : Chapter 15 : Sections 15.1-15.4.

UNIT IV : Chapter 15 : Sections 15.6, 15.7.

UNIT V : Chapter 16 : Sections 16.1-16.4.

BOOKS FOR REFERENCE:

1. Prem Kumar Gupta D. S. Hira, "Operations Research", S. Chand & Company Ltd., New Delhi, 2000.
2. P.R.Vittal and V.Malini, "Operations Research", Margham publications, Chennai,Reprint 2015.
3. S. Dharani Venkata Krishnan, "Operations Research Principles and Problems", Keerthi Publishing House PVT Ltd., New Delhi, 2007.
4. P.R.Vittal, "Introduction to Operations Research", Margham publications, Chennai,Reprint 2005.

QUESTION PAPER PATTERN
SECTION – A
5x15=75 Marks Two questions from each unit(Either … or type)

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Sem	Course Code	Core Paper – VII	Total Marks: 100		Hours Per Week	Credits
IV	17UANCT401	MECHANICS	CIA: 25	ESE:75	4	4

OBJECTIVE:

To enable the students to understand the concepts of Forces, Couples, Friction, Centre of Gravity, Projectiles and impact of a particle on a surface.

COURSE OUTCOME:

On successful completion of the course, the students will able to

CO1 tell the basic principles of forces their acting at a point.

CO2 outline parallel forces, moments and couples.

CO3 describe the principles of friction and centre of gravity

CO4 discuss about projectiles.

CO5 analyze the collision of elastic bodies .

UNIT-I

Forces acting at a point: Resultant and Components: Definition - Simple cases of finding the resultant- Parallelogram of Forces -Triangle of Forces - Lami's theorem - An extended form of the parallelogram law of forces: Theorem - Resolution of a force - Components of a force along two given directions - Theorems on Resolved Parts - Resultant of any number of coplanar forces acting at a point :Graphical and Analytical Method .

UNIT II

Parallel forces and moments: Like and Unlike Parallel forces - Moment of a force - Generalised theorem of moments (Principle of moments).

Couples: Definition - Equilibrium of two couples - Equivalence of two couples - Representation of a couple by a vector - Resultant of coplanar couples: Theorem - Resultant of a couple and a force: Theorem.

UNIT III

Friction: Introduction – Definition - Experimental Results - Laws of Friction - Coefficient of Friction - Angle of Friction - Cone of Friction - Numerical Values - Equilibrium of a particle on a rough inclined plane - Equilibrium of a body on a rough inclined plane under a force parallel to the plane and under any force.

Centre of gravity: Centre of gravity by integration.

UNIT IV

Projectiles: Definition -Two fundamental principles - finding the velocity of the projectile in magnitude and direction at the end of time 't'- Range on inclined plane - Motion on the surface of a smooth inclined plane.

UNIT V

Collision of Elastic Bodies: Introduction - Definitions - Fundamental Laws of Impact - Impact of a smooth sphere on a fixed smooth plane - Direct impact of two smooth spheres - Loss of kinetic energy due to direct impact of two smooth spheres - Oblique impact of two smooth spheres - Loss of kinetic energy due to oblique impact of two smooth spheres.

TEXT BOOKS:

1. M.K.Venkataraman, "Statics", Agasthiar Publications, Trichy, 15th Edition, 2012.

UNIT I : Chapter 2 : Sections 1-15.
UNIT II : Chapter 3 : Sections 1-13.
Chapter 4 : Sections 1-10.
UNIT III : Chapter 7 : Sections 1-12.
Chapter 8 : Section 18.

2. M.K.Venkataraman, "Dynamics", 11th Edition, Agasthiar Publications, Trichy, 2004.

UNIT IV : Chapter 6 : Sections 6.1 - 6.16.
UNIT V : Chapter 8 : Sections 8.1 - 8.8.

BOOKS FOR REFERENCE:

1. A.V. Dharmapadam, "Statics", S.Viswanathan Printers and Publishing Pvt.Ltd, New Delhi, 1993.
2. P.Duraipandian and Laxmi Duraipandian, "Mechanics", S.Chand and company Ltd, Ram Nagar, New Delhi, 1985.
3. Dr.P.P.Gupta, "Statics", Kedal Nath,Ram Nath,Meerut,1983-84.
4. A.V. Dharamapadam, "Dynamics", S.Viswanathan Printers and Publishers Pvt.,Ltd, Chennai, 1998.
5. K.Viswanatha Naik and M.S.Kasi, "Dynamics", Emerald Publishers,Chennai, 1992.

QUESTION PAPER PATTERN		
SECTION – A	**SECTION – B**	**SECTION – C**
10x1=10 Marks (Multiple choice, Four options) Two questions from each unit	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3x10 = 30 Marks (Answer any three questions) One question from each unit

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Sem	Course Code	Skill Based Subject – II	Total Marks: 75		Hours Per Week	Credits
IV	17UANSP404	INTRODUCTION TO SCIENTIFIC COMPUTING OCTAVE	CIA: 20	ESE :55	3	3

OBJECTIVE:

To enable the students to get practice on practical knowledge of essential OCTAVE commands.

COURSE OUTCOME:

On successful completion of the course, the students will able to

CO1 solve various matrix manipulations and system of linear equations.

CO2 plot 2D and 3D graphs.

CO3 examine the palindrome string .

CO4 solve algebraic equations by using bisection and iterative methods.

CO5 solve the first and second order ordinary differential equations.

LIST OF PRACTICALS:

1. Write a program to solve matrix manipulations such as multiplication, inverse, determinant, random, magic etc.
2. Write a program to solve the system of linear equations.
3. Write a program to plot 2D graphs.
4. Write a program to plot 3D graphs.
5. Write a program to solve the quadratic equations.
6. Write an OCTAVE program to check the given string is palindrome or not.
7. Write a program to find the Binomial coefficient nCr.
8. Write a program to generate the Fibonacci numbers.
9. Write a program to solve an algebraic equation using Bisection method.
10. Write a program to solve an algebraic equation using Newton-Raphson method.
11. Write a program to solve the first order ordinary differential equations.
12. Write a program to solve the second order ordinary differential equations.

BOOKS FOR REFERENCE:

Jesper Schmidt Hansen, "GNU Octave Beginner's Guide", Packt Publishing, United Kingdom, 2011.

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Sem	Course Code	Non Major Elective-II	Total Marks: 75	Hours Per Week	Credits
IV	17UANNT405	STATISTICAL METHODS	ESE : 75	2	2

OBJECTIVE:

To enable the students to understand the concepts of random variable, discrete and continuous probability and Sampling distributions.

COURSE OUTCOME:

On successful completion of the course, students will able to

CO1 understand the basic concepts of probability .

CO2 know to test the hypothesis based on attributes.

CO3 distinguish between large and small samples.

CO4 test goodness of fit - χ^2 test

CO5 know the growth of Indian Statistics.

UNIT I

Probability: Introduction - Basic definitions - Addition Theorem and Multiplication Theorem (Statement only) - Problems based on Addition and Multiplication Theorems only.

UNIT II

Sampling theory and Tests of Significance: Estimation Theory - Testing of hypothesis - Test of significance of attributes

UNIT III

Sampling theory and Tests of Significance (Continued): Test of significance for Large Samples - Test of significance for Small Samples

UNIT IV

Chi square Test : Characteristics - Uses - χ^2 as a test of independence .

UNIT V

Growth of Indian Statistics: Statistical Organizations of India - Agricultural Statistics - National Income and Social Accounting - Census in India.

TEXT BOOK:

R.S.N.Pillai and V.Bagavathi ," Statistics", S.Chand and company Ltd, New Delhi,Reprint 2010.

UNIT I	:	Chapter 18 : Page no: 692 - 707.
UNIT II	:	Chapter 20 : Page no: 765 -779.
UNIT III	:	Chapter 20 : Pege no: 779 - 789.
UNIT IV	:	Chapter 21 : Page no: 790 - 800.
UNIT V	:	Chapter 22 : Page no: 809 - 822.

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BOOKS FOR REFERENCE:

1. S.C.Gupta and V.K.Kapoor, "Fundamentals of Mathematical Statistics" , S.Chand and Company Ltd, New Delhi, 2010.
2. S.P.Gupta,"Statistical Methods", S.Chand and Company Ltd , New Delhi, 2012.
3. A.Singaravelu , V.Sundaresan and S.Sivasubramanian, "Probability and Statistics", Meenakshi Agency, Chennai, 2006.
4. C.B.Guptha and Vijay Guptha, "Introduction to Statistical Methods", 23rd Edition, Vikas Publishing, New Delhi, 2004.
5. P.Kandasamy , K.Thilagavathy and K.Gunavathy, "Probability Statistics and Queuing Theory", S.Chand and Company Ltd, New Delhi, 2006.

QUESTION PAPER PATTERN
SECTION – A
5x15=75 Marks Two questions from each unit(Either … or type)

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Sem	Course Code	ADVANCED LEARNERS COURSES	Total Marks: 100	Hours Per Week	Extra Credits
IV	17UANAL406	VEDIC MATHEMATICS	ESE : 100	-	2

OBJECTIVE:

To enable the students to understand the concepts of shortcut method using vedic Mathematics techniques.

COURSE OUTCOME:

On successful completion of the course, the Students will be able to

CO1 solve the basic multiplication and squaring of numbers

CO2 compute perfect cubes and squares

CO3 easily perform multiplication and squaring

CO4 find out answer using digit sum magic square

CO5 solve problems relating dates and calendar

UNIT I

Basic Level: Miscellaneous Simple Method - Cross - Cross System of Multiplication - Squaring Numbers.

UNIT II:

Basic Level: Cube Roots of Perfect Cubes - Square Root of Perfect Squares.

UNIT III

Intermediate Level: Base Method of Multiplication - Base Method of Squaring.

UNIT IV

Intermediate Level: The Digit - Sum Method - Magic Squares.

UNIT V

Intermediate Level: Dates & Calendars - General Equations - Simultaneous Linear Equations.

TEXT BOOK:

1. Dhaval Bathia, "Vedic Mathematics" Made Easy, Jaico Publishing House, Mumbai , 2012.

UNIT I : Chapter 1 : Sections 1 - 3

UNIT II : Chapter 1 : Sections 4 , 5

UNIT III : Chapter 2 : Sections 6 ,7

UNIT IV : Chapter 2 : Sections 8 , 9

UNIT V : Chapter 2 : Sections 10 - 12

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BOOKS FOR REFERENCE:

1. Bharati Krishna Tirtha, "Vedic Mathematics", Publisher, Motilal Banarsidass,Country: India,1965.
2. Vandana Singhal, "Vedic Mathematics for All Ages: A Beginners' Guide", Jainendra Prakash Jain at Jainendra Press, 2007.

QUESTION PAPER PATTERN		
SECTION – A	**SECTION – B**	**SECTION – C**
10x2=20 Marks (Define type-Short Answer)	5 x 7 = 35 Marks (Either or choice) Two questions from each unit	3x15 = 45Marks (Answer any three questions) One question from each unit

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