



Item No. 33.02.058

Subject:: SYLLABUS – Department of Mathematics –
Redrafted Syllabus – Resolutions of the Board of
Studies in Mathematics – Consideration of

RESOLUTION ADOPTED AT THE FOURTH MEETING OF THE
STANDING COMMITTEE OF THE ACADEMIC SENATE HELD ON
24TH JANUARY 2017

Resolved to consider the resolutions of the Board of Studies in Mathematics and
approve the redrafted syllabus for six papers of IV Semester of the masters
programs in M.A./M.Sc. (Mathematics & Applied Mathematics).

Note submitted to the Standing Committee of the Academic Senate is enclosed



Item No. (04.05)

SYLLABUS – Department of Mathematics – Redrafted Syllabus
– Resolutions of the Board of Studies in Mathematics –
Consideration of

The Chairman, Board of Studies in Mathematics has informed the Registrar that board has resolved to approve the redrafted syllabus for M.A./M.Sc. (Mathematics and Applied Mathematics) IV Semester effective from 2017-18 academic year. The details of the program, paper code and paper title are as follows:

SN	Program	Paper Code	Paper Title
01		M4CP2 & AMLOP4 (2)	Graph Theory
02	M.A./M.Sc. (Mathematics & Applied Mathematics)	M40P4 (3) & AM4OP4) (6)	Operational Research – II
03		M40P4 (6) & AM4OP4 (6)	Theory of Reliability

According to the minutes of the Board of Studies in Mathematics, the redrafted syllabus pertaining to M.A./M.Sc. (Mathematics & Applied Mathematics) for the IV Semester are to be effective from the academic year 2017-18.

The above is accordingly placed before the Standing Committee of Academic Senate for decision.

Matter for Decision

To consider the resolutions of the Board of Studies in Mathematics and approve the redrafted syllabus for six papers of IV Semester of the masters programs in M.A./M.Sc. (Mathematics & Applied Mathematics).

Minutes of the meeting of the Board of Studies
in Mathematics held in the Department of Mathematics
on 05-01-2018 at 12:00 pm

Members Present.

1. Dr. A.P. Raj Kumar Chairman
2. Prof. T. Seemivas Member
3. Prof. P. Hally Hally Member
3. Dr. T. Sumathi Uma Maheswari Member
4. Dr. M. Pirumala Devi, Head Member
5. Dr. R. Potharavi Sharma Member
6. Dr. K. Somaiah Member

Resolutions

1. It is resolved to approve the redrafted syllabus in the following papers of MA/MSc (Mathematics/Applied Mathematics) - IV Semester which will come into force from the academic year (2017-18)

MSc. (Mathematics)	M4CP2	Graph Theory
MSc. (Applied Mathematics)	AM4OP4(2)	Graph Theory
MSc. (Mathematics)	AM4OP4(3)	Operator Theory
MSc. (Mathematics & Applied)	AM4OP4(6)	Theory of Relativity

- | | | |
|-----------------------|-----------------------|-----------------------|
| 1. <u>[Signature]</u> | 2. <u>[Signature]</u> | 3. <u>[Signature]</u> |
| 4. <u>[Signature]</u> | 5. <u>[Signature]</u> | 6. <u>[Signature]</u> |

Department of Mathematics
Kakatiya University, Warangal - 506009



Dr. L. P. Raj Kumar
Chairman, Board of Studies

Phone: 0870-2461425 (Work), Fax: 0870-2438800, E-Mail: lp_raj8@yahoo.com

No. 113/M/BoS/KU/2018

Date: 05-01-2013

To
The Registrar
Kakatiya University
Warangal.

Sub: Resolutions – Redrafted Syllabus – Department of Mathematics – Reg. & Reg.

Sir


With respect to the subject cited above, I am herewith submitting resolutions taken of the redrafted syllabus in the meeting held at the Department of Mathematics.

1. It is resolved to approve the redrafted syllabus in the following paper of MA/MSc(Mathematics/Applied Mathematics) IV –Semester which will come into force from this academic year 2017-13.

- a. M.Sc.(Mathematics/Applied Mathematics) M4CP2/ AMLOP4(2) Graph Theory
- b. M.Sc.(Mathematics/Applied Mathematics) M4OP4(3)/AM4OP4(3) Operations Research -II
- c. M.Sc.(Mathematics/Applied Mathematics) M4OP4(6)/ AM4OP4(6) Theory of Reliability

In this regard, I request you to approve the same.

Your Truly


Dr. L. P. Raj Kumar
Chairman, Board of Studies in Mathematics

Enclosures:

- 1 Resolutions
- 2 Redrafted Syllabus

approved
W. S. S. S. S.
DEAN
Faculty of Science
Kakatiya University
Warangal-506 009 (T.S.)

U.Sc. (Mathematics)

SEMESTER-IV

Paper	Code of The paper	Title of The paper	No. of Periods (1 hr duration) per week	Internal Assessment Marks	Semester End Exam Marks			Credits (L+T+P)
					Theory	Practical	Total	
I	M4CP1	Advanced Linear Algebra	6	20	80	-	100	4+1+0
II	M4CP2	Graph Theory	6	20	80	-	100	4+1+0
III	M4CP3	Integral Equations and Transforms	6	20	80	-	100	4+1+0
IV	M4OP4(1)	Near Rings	6	20	80	-	100	4+1+0
	M4OP4(2)	Theory of Ordinary Differential Equations						
	M4OP4(3)	Operations Research - II						
	M4OP4(4)	Numerical Analysis - II						
	M4OP4(5)	Automata and Machines						
	M4OP4(6)	Theory of Reliability						
V	M4OP5(1)	Programming Methodology	7(4+3)	20	60	20	100	3+1+1
	M4OP5(2)	Programming in C++						
	M4OP5(3)	Applied Stochastic Process with MATLAB						
		Seminar					25	1
Total Credits								26

L → Lecture, T → Tutorial, P → Practical, M → Mathematics, CP → Core Paper

Summary

Semester	No. of Credits	Marks
I	26	525
II	26	525
III	26	525
IV	26	525
Total	104	2100

Board of Studies in Mathematics, Kakatiya University

M.Sc. (Applied Mathematics)

SEMESTER-IV

Paper	Code of The paper	Title of The paper	No. of Periods (1 hr duration) per week	Internal Assessment Marks	Semester End Exam Marks			Credits (L+T+P)
					Theory	Practical	Total	
I	AM4CP1	Functional Analysis	6	20	80	-	100	4+1+0
II	AM4CP2	Fluid Dynamics	6	20	80	-	100	4+1+0
III	AM4CP3	Integral Equations and Transforms	6	20	80	-	100	4+1+0
IV	AM4OP4(1)	Bio Mechanics	6	20	80	-	100	4+1+0
	AM4OP4(2)	Graph Theory						
	AM4OP4(3)	Operations Research - II						
	AM4OP4(4)	Numerical Analysis - II						
	AM4OP4(5)	Automata and Machines						
	AM4OP4(6)	Theory of Reliability						
V	AM4OP5(1)	Programming Methodology	7(4+3)	20	60	20	100	3+1+1
	AM4OP5(2)	Programming in C++						
	AM4OP5(3)	Applied Stochastic Process with MATLAB						
		Seminar					25	1
Total Credits								26

L → Lecture, T → Tutorial, P → Practical, AM → Applied Mathematics, CP → Core Paper

Summary

Semester	No. of Credits	Marks
I	26	525
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III	26	525
IV	26	525
Total	104	2100

Board of Studies in Mathematics, Kakatiya University

KAKATIYA UNIVERSITY
 M.A. /M.Sc. MATHEMATICS Syllabus (w.e.f.2016-18)
 Semester -IV
 Paper - II
 Paper Code: M4CP2
GRAPH THEORY

UNIT - IRelations and Digraphs

Relations and Digraphs – Special Properties of Binary Relations – Equivalence Relations – Ordering Relations – Lattices and Enumerations – Paths and Closures – Directed Graphs and Adjacency Matrices

UNIT - IIGraphs

Basic Concepts – Isomorphism and Subgraphs – Trees and their properties – Spanning Trees – Directed Trees – Binary Trees.

UNIT - IIIMultigraphs

Planar Graphs - Euler's Formula – Königsberg Seven Bridges problems – Multigraphs – Euler Circuits – Hamiltonian Graphs – Chromatic Numbers – The Four-Colour Problem.

UNIT - IVNet works flows

Graphs as Models of Flow of Commodities – Flows – Maximal Flows and Minimal cuts- The Maxflow Min- Cut Theorem – Applications – Matching and Hall's Marriage Theorem.

TEXT BOOK :

Discrete Mathematics for Computer Scientists and Mathematicians By J.L. Mott.
 A. Kandle, P.Baker.

REFERENCE BOOKS :

1. A First Book at Graph Theory – By John Clark and Derek Allan Hotten.
2. Discrete Mathematical Structures & Graph Theory – By Rao
3. A Text Book of Graph Theory and its applications – By B. Suryanarayana and G.K. Ranganath.

KAKATIYA UNIVERSITY
 M.Sc.APPLIED MATHEMATICS, Syllabus (w.e.f 2016-18)
 Semester -IV
 Paper - IV (Elective)
 Paper Code: AM4OP4(2)
GRAPH THEORY

UNIT - IRelations and Digraphs

Relations and Digraphs – Special Properties of Binary Relations – Equivalence Relations – Ordering Relations – Lattices and Enumerations – Paths and Closures – Directed Graphs and Adjacency Matrices

UNIT - IIGraphs

Basic Concepts – Isomorphism and Subgraphs – Trees and their properties – Spanning Trees – Directed Trees – Binary Trees.

UNIT - IIIMultigraphs

Planar Graphs - Euler's Formula – Königsberg Seven Bridges problems – Multigraphs – Euler Circuits – Hamiltonian Graphs – Chromatic Numbers – The Four-Colour Problem.

UNIT - IVNet works flows

Graphs as Models of Flow of Commodities – Flows – Maximal Flows and Minimal cuts- The Maxflow Min- Cut Theorem – Applications – Matching and Hall's Marriage Theorem.

TEXT BOOK :

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3. A Text Book of Graph Theory and its applications – By B. Suryanarayana and G.K. Ranganath.

M4OP4(3)

KAKATIYA UNIVERSITY
M.A. /M.Sc. MATHEMATICS Syllabus (w.e.f.2016-18)
Semester -IV

Paper - IV(Elective)
Paper Code: M4OP4(3)
OPERATIONS RESEARCH - II

UNIT I:

Sequencing and Scheduling: Sequencing Problem – The Problem of n Jobs and Two Machines – Problem with n Jobs and m Machines – General Problem of n Jobs and m Machines - Scheduling – Critical Path Determination by CPM – Critical Path Determination by PERT – Optimum Scheduling by CPM.
(Chapter 7 of Text Book 1)

UNIT II

Queueing Theory – Introduction – Queueing system – Elements of a Queueing system – Operating characteristics of a Queueing system – Deterministic Queueing system – Probability distributions in Queueing systems – Classification of Queueing Models – Definition of Transient and Steady States – Poisson Queueing systems.
(Chapter 21: Sec 21.1 to 21.9 of Text Book 2)

UNIT III

Dynamic Programming – Introduction – The recursive equation approach – Characteristics of Dynamic Programming – Dynamic Programming Algorithm – Solution of L.P.P. by Dynamic Programming.
(Chapter 13: Sec 13.1 to 13.4, 13.7 of Text Book 2)

UNIT-IV

Non-Linear Programming – General Non – Linear Programming Problem – Constrained Optimization with Equality Constraints - Constrained Optimization with Inequality Constraints – Non – Linear Programming Methods – Graphical Solution – Quadratic Programming – Wolfe's Modified Simplex Method – Beale's Method.
(Chapter 27: Sec 27.3 to 27.5, Chapter 28: Sec 28.1, 28.2, 28.4 to 28.6 of Text Book 2)
Text Book:

1. Introduction to Optimization Operations Research by J.C.Pant(6th Edition)
2. Operations Research by Kanthi Swarup, P.K.Gupta, Man Mohan, Sultan Chand & Sons

M4OP4(4)

Board of Studies in Mathematics, Kakatiya University

KAKATIYA UNIVERSITY
 M.A. /M.Sc. MATHEMATICS Syllabus (w.e.f.2016-18)
 Semester -IV
 Paper -V (Elective)
 Paper Code: M4OP4(6)
THEORY OF RELIABILITY

UNIT I

Reliability – Definition of Reliability - Failure Data Analysis – Failure data – Mean failure rate – Mean time to failure – Mean time between failures – Graphical plots – MTTF in terms of failure density – Generalization - Reliability in terms of Hazard rate and failure density – Mean time to failure in integral form - Hazard Models: Constant Hazard, Linearly increasing Hazard – The Weibull model – Distribution functions and reliability analysis – Some important distributions - Expected value — Standard deviation and variation.
 (Chapter 2, Chapter 3: Sec 3.1 to 3.11, Chapter 4: Sec 4.1 to 4.4, 4.6, 4.7, 4.9, 4.10 of Text Book1)

UNIT II

Interference Theory and Reliability Computations – General expression for reliability – Reliability computations for normally distributed strength and stress – Reliability computation for exponential distributed strength and stress - Reliability computation for gamma distributed strength and stress- Reliability computation for weibull distributed strength and stress.
 (Chapter 6: Sec 6.1, 6.2, 6.4, 6.6, 6.8 of Text Book 2)

UNIT III

System Reliability – Series configuration – Parallel configuration – Mixed configuration – Logic diagrams – Markov models – Markov graphs.
 (Chapter 6: Sec 6.1 to 6.4, 6.10 to 6.12 of Text Book 1)

UNIT IV

Reliability improvement – Improvement of components – Redundancy - Element Redundancy - Unit Redundancy - Standby Redundancy.
 Maintainability and availability - Maintainability – Availability.
 Repairable systems – Instantaneous repair rate – Mean time to repair – Reliability and availability functions.
 (Chapter 7: Sec 7.1 to 7.6, Chapter 9: Sec 9.1 to 9.3, chapter 10 of Text Book 1)

Text Book:

1. Reliability Engineering by L.S. Srinath
2. Reliability in Engineering Design by K.C.Kapur, L.R.Lamberson

Reference Books:

Reliability Engineering by E.Balagurusamy

Board of Studies in Mathematics, Kakatiya University

No. 290/B2/KU/2018

February 19, 2018

To
All the Principals of Post-graduate Colleges under Kakatiya University
offering M.A. / M.Sc. (Mathematics/Applied Mathematics)

Sir/Madam

Sub: SYLLABUS – Post-graduation in M.A. / M.Sc.
(Mathematics/Applied Mathematics) – Syllabus Re-drafted for IV
Semester – Standing Committee of Academic Senate – Approval of
– Necessary Follow-up Action Called For – Regarding

In pursuance of the decision taken by the Standing Committee of the Academic Senate at its 4th Meeting (of 2017-18) held on 22 January 2018, the Vice-Chancellor, considering the resolution of the Board of Studies in Mathematics at its meeting held on 5 January 2018, approved the 'Re-drafted Syllabus' of the SIX papers of IV Semester of the Post-graduation program in M.A. / M.Sc. (Mathematics/Applied Mathematics) effective from the academic year 2017-18.

Copy of the re-drafted syllabus is made available in the Kakatiya University official website, and can be retrieved from: <http://kakatiya.ac.in/courses> (> P.G. Programs/Faculty/Program).

The above may be brought to the notice of the staff and students, and necessary follow-up action of teaching-evaluation process is undertaken.

Thanks and regards,

Sd/-

REGISTRAR

Encl:

1. Re-drafted Syllabus of Post-graduation in M.A. / M.Sc. (Mathematics/Applied Mathematics)

Copy to:

1. The Head, Department of Mathematics, KU
2. The Chairperson Board of Studies in Mathematics
3. The Dean, Faculty of Science, KU
4. The Dean, College Development Council, KU
5. The Dean, Academic Affairs, KU
6. The Secretary to the Vice-Chancellor, KU
7. The SF