Annexure – I

CENTRAL UNIVERSITY OF SOUTH BIHAR

Master of Science in Mathematics (M.Sc. in Mathematics)
Programme
Syllabus

(Effective from the Academic Session 2018-2019)

Department of Mathematics

School of Mathematics, Statistics and Computer Science

Central University of South Bihar, Gaya
School of Mathematics, Statistics and Computer Science

DEPARTMENT OF MATHEMATICS

Two years M.Sc. (Mathematics) Programme
Under CBCS Scheme of UGC

COURSE STRUCTURE		
Sl. No.	**Course Division**	**Credits**
1.	Core courses (14) + Project	56+16=72
2.	Elective courses from the Department (2)	12
3.	Elective course out of Department (4)	12
	Total Credits	**96**

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)	
I	To provide students with a strong foundation in mathematical, scientific fundamentals so as to comprehend, analyse, design and create solutions for automation of real life processes.
II	To inculcate in students' professional and ethical attitude, effective communication skills, leadership, team work skills, multidisciplinary approach, and an ability to relate application based issues to broader social context.
III	To provide student with an academic environment with awareness of excellence, and the life-long learning needed for a successful professional career.

PROGRAM OUTCOMES (PEOs)	
1	An ability to apply knowledge of mathematics in different fields.
2	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
3	An ability to function on multidisciplinary teams.
4	An ability to identify, formulate and solve real world problems.
5	An understanding of professional and ethical responsibility.
6	An ability to communicate effectively.
7	The broad education necessary to understand the impact of Mathematics solutions in a global and societal context.
8	Recognition of the need for, and an ability to engage in lifelong learning.
9	Knowledge of contemporary issues.
10	An ability to use the techniques, skills and modern Mathematical tools necessary for application based practices.
11	An ability to design and develop principles for solving complex problems of Mathematics.
12	An ability to plan, organize and use appropriate methods to carry on tasks within a given frame work.

COURSE STRUCTURE			
Sl. No.	**Course Code**	**Course Title**	**Credits**
Semester I			
1.	MSMTH1001C04	Real Analysis	4
2.	MSMTH1002C04	Linear Algebra	4
3.	MSMTH1003C04	Discrete Mathematics	4
4.	MSMTH1004C04	Ordinary Differential Equations and Laplace Transformation	4
5.	MSMTH1005C04	Operation Research	4
6.		Elective (Out of the Department of Mathematics)	4
Semester II			
7.	MSMTH2001C04	Complex Analysis	4
9.	MSMTH2002C04	Algebra-I	4
9.	MSMTH2003C04	Topology	4
10.	MSMTH2004C04	Measure and Integration	4
11.		Elective (Out of the Department of Mathematics)	4
12.		Elective (from the Department of Mathematics)	4
Semester III			
13.	MSMTH3001C04	Functional Analysis	4
14.	MSMTH3002C04	Algebra-II	4
15.	MSMTH3003C04	Partial Differential Equation and Fourier Analysis	4
16.	MSMTH3004C04	Numerical Analysis	4
17.	MSMTH3005C04	Project (Part-I)	6
		Project Seminar	2
Semester IV			
18.	MSMTH4001C04	Project (Part-II)	6
		Project Viva	2
19.	MSMTH4002C04	Probability and Statistics	4
20.		Elective (from the Department of Mathematics)	4
21.		Elective (from the Department of Mathematics)	4
22.		Swayam Course/Elective out of the school	4
		Total Credits	**96**

CORE COURSES				Page Number
Sl. No	**Course Code**	**Course Title**	**Credits**	
Semester I				
1.	MSMTH1001C04	Real Analysis	4	9
2.	MSMTH1002C04	Linear Algebra	4	11
3.	MSMTH1003C04	Discrete Mathematics	4	13
4.	MSMTH1004C04	Ordinary Differential Equations and Laplace Transformation	4	16
5.	MSMTH1005C04	Operation Research	4	19
Semester II				
6.	MSMTH2001C04	Complex Analysis	4	21
7.	MSMTH2002C04	Algebra-I	4	24
8.	MSMTH2003C04	Topology	4	27
9.	MSMTH2004C04	Measure and Integration	4	29
Semester III				
10.	MSMTH3001C04	Functional Analysis	4	31
11.	MSMTH3002C04	Algebra-II	4	33
12.	MSMTH3003C04	Partial Differential Equation and Fourier Analysis	4	35
13.	MSMTH3004C04	Numerical Analysis	4	37
14.	MSMTH3005C04	Project (Part-I)	6	
		Project Seminar	2	
Semester IV				
15.	MSMTH4001C04	Project (Part-II)	6	
		Project Viva	2	
16.	MSMTH4002C04	Probability and Statistics	4	39
		Total Credits	**72**	

ELECTIVE BASKET				Page Number
S. No	**Course Code**	**Course Name**	**Credits**	
Semester II				
1.	MSMTH2001E04	Mechanics	4	43
2.	MSMTH2002E04	Calculus of Variations and Integral Equations	4	45
3.	MSMTH2003E04	Differential Geometry	4	47
4.	MSMTH2004E04	Graph Theory	4	49
5.	MSMTH2005E04	Number Theory	4	51
Semester IV				
6.	MSMTH4001E04	Fluid Mechanics	4	53
7.	MSMTH4002E04	Formal Languages and Automata Theory	4	55
8.	MSMTH4003E04	Numerical Solutions to PDE	4	57
9	MSMTH4004E04	Group Theory	4	59
10	MSMTH4005E04	Commutative Algebra	4	61
11	MSMTH4006E04	Algebraic Number Theory	4	63
12	MSMTH4007E04	Introduction to Finite Fields and Coding Theory	4	65
13	MSMTH4008E04	Lie Algebra	4	67
14	MSMTH4009E04	Operator Theory	4	69
15	MSMTH4010E04	Representation Theory Finite Groups	4	71
16	MSMTH4011E04	Algebraic Geometry	4	73
17	MSMTH4012E04	Spectral Graph Theory	4	75
18	MSMTH4013E04	Wavelet Analysis	4	77
19	MSMTH4014E04	Mathematical Cryptography	4	79

SWAYAM COURSES		
S. No.	**Course Code**	**Course Name**
1	MSMTH40015E04	Probability and Stochastic for Finance.
2	MSMTH40016E04	Partial Differential Equations for Engineers Solution by Spare.
3	MSMTH40017E04	Application of Molecular Geometry & Group Theory

SKILL BASED/SELF-STUDY COURSES (NON-CREDIT)		
S. No	**Course Code**	**Course Name**
1	MSMTH40018E04	LATEX
2	MSMTH40019E04	MAT LAB