Department of MASTER OF COMPUTER APPLICATIONS

Board of Studies Meeting

Date: 20TH JUNE 2020.

Contents

New Horizon College of Engineering, Bangalore

Department of Master of Computer Applications

Agenda for the meeting

AGENDA

Agenda 1: Highlights of the MCA Programme (3-Year & 2-Year)

Agenda 2: **a)** Scheme and Syllabus for 2018-2021 Batch (V, VI semester – Discussion, Recommendation and Approval.)

b) Scheme and Syllabus for 2020-2021 Batch (a 2-Year MCA Program – Curriculum Structure, Detailed Syllabus Discussion, Recommendation and Approval.)

Agenda 3: CO, PO, Credit and RBT level requirements and mapping verification.

Agenda 4: Equivalence courses for change and scheme.

Agenda 5: Innovative Ideas from Board Members.

Agenda 6: List of approved examiners for the academic year 2020-21.

Agenda 7: Approval for Digital Initiative.

Agenda 8: Suggestion for Open Source & Open Standard Practices.

Agenda 9: Stakeholders feedback and considerations

Agenda 10: Recommendations of the Board.

BOARD OF STUDIES (2020-21)

S. No.	Academic Board	Structure/Constitution	Functions/Responsibilities	Frequency of Meetings
1	Board of Studies(BOS) ***BOS Members List**	BOS Constituted with • Head of the Department as Chairman • 6-Faculty members at different level with different specialization • 2-Subject experts from outside the college nominated by academic council • 1-Academic Expert from outside the college nominated by VTU • 2-Representatives from Industry / Corporate sector / allied area related to placements, nominated by academic council • 1-Post Graduate meritorious alumni nominated by Principal • 4-Co-opted members with academic & research expertise	• Recommendation and approval of curriculum-Scheme & Syllabus • Suggestions for incorporating new technologies / course • Removal of obsolete topics • To bridge the gap between industry and academia with supportive instructions and relevance • Validation and approval of course objectives and outcomes • Module-wise recommendation/discussion/ suggestion for each proposed course of curriculum • Recommendations and approval of rubrics for evaluation	Once in a year

VTU NOMINATION APPROVAL (2020-22)

Visvesvaraya Technological University

"Jnana Sangama", Belagavi - 590 018.

Phone: (0831) 2405468

REGISTRAR Fax : (0831) 2405467

Ref No. VTU/Aca/A12/2020-21/ 787/8 Date: 18 JUN 2020

To,
Dr. Pravin Kumar Sinha
Senior Software Engineer,
Hortonworks Data Platform,
Bangalore

Sir,

Sub: Nomination to the Board of studies (Master of Computer Application) of New Horizon College of Engineering, Bengaluru (Autonomous) from 17-6-2020 to 17-6-2022.

Ref: Hon'ble Vice Chancellor's approval dated 17-6-2020

With reference to the above, I am pleased to nominate you as the Nominee of Visvesvaraya Technological University, Belagavi, to the "Board of Studies (Master of Computer Application)" of New Horizon College of Engineering, Bengaluru (Autonomous).

You are requested to accept the same and attend the meetings of the "Board of Studies (Master of Computer Application)" of the college as and when requested by the principal of the college and ensure that the views and guidelines of the University are duly taken into account in the deliberations and decisions of the Board of Studies.

Thanking you,

Yours faithfully,

REGISTRAR

Copy Fwc's to:
The Principal, New Horizon College of Engineering, Bengaluru., with a request to send meeting notices of the Board of studies **Dr. Pravin Kumar Sinha**, from time to time. Please note that the TA/DA/Hospitality of V.T.U Nominee for attending Board of studies (Master of Computer Application) meetings have to be borne by your college.

CONTENTS

List of Members

SI No.	Category	Name of the Person
1	Chairman – BOS	Dr. V. Asha, Professor and Head, Department of MCA, NHCE, Bangalore.
2	Subject Experts from outside the College nominated by Academic Council (VTU Nominee)	Mr. Pravin Kumar Sinha Sr. Software Engineer, Hortonworks, Bangalore.
3	Representative from Industry/ Corporate Sector / allied area relating to placements nominated by Academic Council	Dr. Balaji, Joint-Director, C-DAC, Bangalore.
		Prof. Gurucharan Singh, Executive Director, Department of HRD, New Horizon College of Engineering, Bangalore.
		Mr. Manish Ranjan, Head IIC, Department of HRD, New Horizon College of Engineering, Bangalore.
4	Postgraduate Meritorious alumnus nominated by Principal	Mr. Vipul Kumar, Sr. Project Manager, OpenText , Bangalore.
5	Subject Experts from outside the College nominated by Academic Council	Dr. Jagannatha S Professor, Dept. of MCA, MSRIT, Bangalore.
		Dr. Vijaykumar K Professor, Dept of MCA, BMS College of Engineering, Bangalore.

6	Faculty members at different level veering different specializations	Dr.K.G.Madhwaraj
		Dr.A.P Nirmala
		Dr.B. Meenakshi Sundaram
		Prof. Sreeja
		Prof. Govinda Raju
		Prof. Vishwanatha
7	Co-opted members	Prof. S.N. Kavitha
		Prof. Jincy C Mathew
		Dr. R. Prema
		Prof. Anu Bala Khurana

List of Members Present

SI No.	Category	Name of the Person
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		Mr. Ranjan Manish, Head IIC, Department of HRD, New Horizon College of Engineering, Bangalore.
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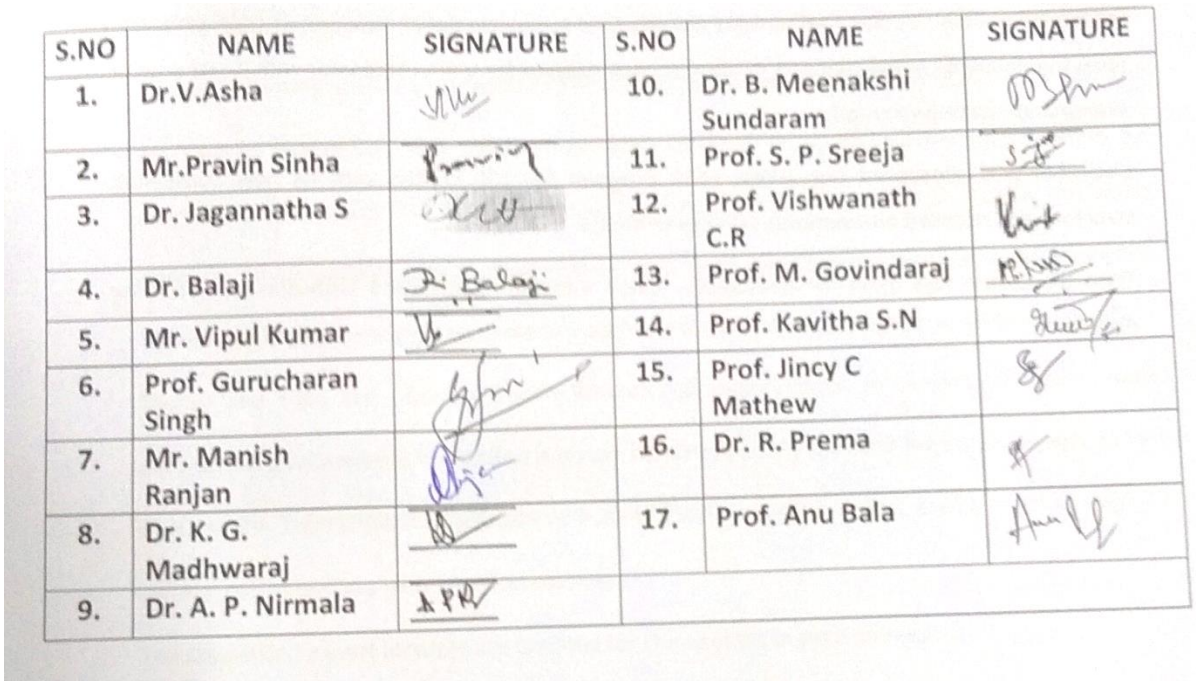
		Dr.A.P Nirmala
		Dr.B. Meenakshi Sundaram
		Prof. Sreeja
		Prof. Govinda Raju
		Prof. Vishwanatha
7	Co-opted members	Prof. S.N. Kavitha
		Prof. Jincy C Mathew
		Dr. R. Prema
		Prof. Anu Bala Khurana



S.NO	NAME	SIGNATURE	S.NO	NAME	SIGNATURE
1.	Dr.V.Asha		10.	Dr. B. Meenakshi Sundaram	
2.	Mr.Pravin Sinha		11.	Prof. S. P. Sreeja	
3.	Dr. Jagannatha S		12.	Prof. Vishwanath C.R	
4.	Dr. Balaji	Dr. Balaji	13.	Prof. M. Govindaraj	
5.	Mr. Vipul Kumar		14.	Prof. Kavitha S.N	
6.	Prof. Gurucharan Singh		15.	Prof. Jincy C Mathew	
7.	Mr. Manish Ranjan		16.	Dr. R. Prema	
8.	Dr. K. G. Madhwaraj		17.	Prof. Anu Bala	
9.	Dr. A. P. Nirmala	APN			

WELCOME ADDRESS BY THE CHAIRMAN OF BOS AND INTRODUCTION OF MEMBERS

Board of Studies meeting was held on 20th June, 2020 at 10:30 AM in the Department of MCA.

Chairman Dr. V. Asha, Head of the Department, Dept of MCA welcome all the members of BOS. She introduced all external experts to the team of faculty members.

Chairman BOS presented the agenda and proceed by explaining the credit distribution of 2018-19 MCA intake batch. Total of 132 credits are required for successful completion of MCA program. Then the detailed course contents of autonomous syllabus for V & VI semester with its scheme of examination were presented.

Chairman BOS presented the 2-Year MCA program for 100 credits with its new curriculum structure and detailed autonomous syllabus contents.

Then the forum was open for discussion. Every member contributed enthusiastically for the discussion.

AGENDA 1: Highlights of the MCA Programme

1. The MCA curriculum is well balanced with more exposure to theoretical and practical aspects of academic research and industrial perspectives.
2. In the 2-Year MCA program, the necessary and sufficient fundamental courses required for computing are kept as core in I, II, III semesters as per the pre-requisites and co-requisites. Some applied courses are integrated with core to improve the practical aspects more. Like Unix and Operating System, Computer Networks with Lab, both the levels of Java with its lab and Software engineering with Testing lab etc.,
3. The electives groups are listed with the particular track specialized courses. There are totally 7 different electives groups are identified and distributed across II and III semesters. The students are free to choose any one course from each electives group to undergo to complete the program. The need of elective grouping is research, logic, and emotion defines the ability grouping, which increases the student achievement by allowing teachers to focus proportionately. Teaching alike groups makes teachers to adjust the frequency of instruction to students' needs.
4. Theory and Labs are separated with focused lab experiments. In certain demand-oriented programming courses the facilitation is a pure hands-on, i.e. Python and Bigdata analytics. In such courses, the Tutorial/Skill Development Activity (SDA) are given with 1 credit to emphasize the tutorial sessions along with Practical sessions.
5. The specialized expert lectures are planned for the courses in each semester.
6. Intensive placement training programs are enforced for the pre-final and final year students to get the better placements.
7. Mini-project(s) are aligned with courses undertaken in the respective semester, which helps to apply the learned knowledge to the real-time case studies.

AGENDA 2: Scheme and Syllabus

3-YEAR MCA DEGREE CURRICULUM – CREDIT DISTRIBUTION TABLE

FOR THE 2018-19 & 2019-20 BATCH (132 CREDITS)

SEMESTER I TO VI

SEMESTER	CORE	ELECTIVES	MINI/ PROJECT WORKS	SEMINAR	TOTAL CREDITS
I	22	0	0	0	22
II	20	0	2	0	22
III	12	6	2	2	22
IV	9	9	2	2	22
V	10	12	3	0	25
VI	0	0	17	2	19
TOTAL	73	27	26	6	132
PERCENTAGE OF DISTRIBUTION	55	20	20	5	
MIN REQ	40-55	20-35	20-35	02-10	

2-YEAR MCA DEGREE CURRICULUM – CREDIT DISTRIBUTION TABLE

FOR THE 2020-21 BATCH ONWARDS (100 CREDITS)

SEMESTER I TO IV

SEMESTER	CORE	ELECTIVES	MINI/ PROJECT WORKS	SEMINAR	TOTAL CREDITS
I	25	0	0	0	25
II	17	6	2	0	25
III	13	9	3	0	25
IV	0	6	17	2	25
TOTAL	55	21	22	2	100
PERCENTAGE OF DISTRIBUTION	55%	21%	22%	2%	
MIN REQ	40-55	20-35	20-35	02-10	

SCHEME OF FIRST SEMESTER (2018-21)

S. No	Course Code	Course	BOS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	T	P	S			CIE	SEE	Total
1	18MCA11	Problem Solving using C	MCA	3	0	0	0	3	3	50	50	100
2	18MCA12	Discrete Mathematics	BS	4	1	0	0	5	6	50	50	100
3	18MCA13	Computer Organization	MCA	4	0	0	0	4	4	50	50	100
4	18MCA14	Unix Programming	MCA	3	0	0	0	3	3	50	50	100
5	18MCA15	Web Technologies & its Applications	MCA	3	0	0	0	3	3	50	50	100
6	19MCA16	Life Skills for Professionals	HSS	Mandatory Course				0	2	25	25	50
7	18MCAL17	Problem Solving using C Lab	MCA	0	0	1.5	0	1.5	3	25	25	50
8	18MCAL18	UNIX Programming Lab	MCA	0	0	1.5	0	1.5	3	25	25	50
9	18MCAL19	Web Technologies & its Applications Lab	MCA	0	0	1	0	1	2	25	25	50
Total								**22**	**29**	**350**	**350**	**700**

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

SCHEME OF SECOND SEMESTER (2018-21)

S. No	Course Code	Course	BOS	Credit Distribution				Overall Credits	Contact Hours	Marks		
				L	T	P	S			CIE	SEE	Total
1	18MCA21	Data Structures using C	MCA	3	0	0	0	3	3	50	50	100
2	18MCA22	Operating Systems	MCA	4	0	0	0	4	4	50	50	100
3	18MCA23	System Programming	MCA	3	0	0	1	4	4	50	50	100
4	18MCA24	Object Oriented Programming using C++	MCA	3	0	0	0	3	3	50	50	100
5	18MCA25	Software Engineering	MCA	3	0	0	0	3	3	50	50	100
6	18MCA26	Mini Project on Data Structures and Operating	MCA	-				2	-	25	25	50
7	18MCAL27	Data Structures using C Lab	MCA	0	0	1.5	0	1.5	3	25	25	50
8	18MCAL28	Object Oriented Programming using C++ Lab	MCA	0	0	1.5	0	1.5	3	25	25	50
TOTAL								**22**	**23**	**325**	**325**	**650**

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

SCHEME OF THIRD SEMESTER (2018-21)

S.NO	COURSE CODE	COURSE	BOS	CREDIT DISTRIBUTION			OVERALL CREDITS	CONTACT HOURS WEEKLY	MARKS		
				L	T	P			CIE	SEE	TOTAL
1	19MCA31	PROGRAMMING CONCEPTS USING JAVA	MCA	3	0	0	3	3	50	50	100
2	19MCA32	DATABASE MANAGEMENT SYSTEM	MCA	3	0	0	3	3	50	50	100
3	19MCA33	COMPUTER NETWORKS	MCA	3	0	0	3	3	50	50	100
4	19MCA34X	ELECTIVES-1	MCA	3	0	0	3	3	50	50	100
5	19MCA35X	ELECTIVES-2	MCA	3	0	0	3	3	50	50	100
6	19MCA36	LIFE SKILLS SEMINAR	HSS	-			2	0	25	25	50
7	19MCAL37	PROGRAMMING CONCEPTS USING JAVA LAB	MCA	0	0	1.5	1.5	3	25	25	50
8	19MCAL38	DATABASE MANAGEMENT SYSTEM LAB	MCA	0	0	1.5	1.5	3	25	25	50
9	19MCA39	MINI PROJECT USING JAVA AND DBMS	MCA	-			2	-	25	25	50
TOTAL							**22**	21	350	350	700

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

ELECTIVES-1						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T	P	
1	19MCA341	NON RELATIONAL DATABASES (NoSQL)	3	0	0	3
2	19MCA342	USER INTERFACE DESIGN AND HUMAN COMPUTER INTERACTION	3	0	0	3
3	19MCA343	DATA WAREHOUSING AND DATA MINING	3	0	0	3
4	19MCA344	DIGITAL IMAGE PROCESSING	3	0	0	3
5	19MCA345	COMPUTATIONAL STATISTICS FOR MACHINE LEARNING	3	0	0	3

ELECTIVES-2						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T	P	
1	19MCA351	DISTRIBUTED SYSTEMS	3	0	0	3
2	19MCA352	COMPUTER GRAPHICS	3	0	0	3
3	19MCA353	CYBER SECURITY AND CYBER LAW	3	0	0	3
4	19MCA354	COMPILER DESIGN	3	0	0	3
5	19MCA355	SYMBOLIC LOGIC AND AUTOMATED REASONING	3	0	0	3

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

SCHEME OF FOURTH SEMESTER (2018-21)

SNO	COURSE CODE	COURSE	BOS	CREDIT DISTRIBUTION			OVERALL CREDITS	CONTACT HOURS WEEKLY	MARKS		
				L	T	P			CIE	SEE	TOTAL
1	19MCA41	ADVANCED JAVA AND ENTERPRISE ARCHITECTURE	MCA	3	0	0	3	3	50	50	100
2	19MCA42	DESIGN AND ANALYSIS OF ALGORITHMS	MCA	3	0	0	3	3	50	50	100
3	19MCA43X	ELECTIVES-3	MCA	3	0	0	3	3	50	50	100
4	19MCA44X	ELECTIVES-4	MCA	3	0	0	3	3	50	50	100
5	19MCA45X	ELECTIVES-5	MCA	3	0	0	3	3	50	50	100
6	19MCA46	TECHNICAL SEMINAR-I	MCA	-			2	-	25	25	50
7	19MCA47	PROFESSIONAL ETHICS FOR SOFTWARE ENGINEERS	MCA	MANDATORY COURSE			0	2	25	25	50
8	19MCAL48	ADVANCED JAVA AND ENTERPRISE ARCHITECTURE LAB	MCA	0	0	1.5	1.5	3	25	25	50
9	19MCAL49	DESIGN AND ANALYSIS OF ALGORITHMS LAB	MCA	0	0	1.5	1.5	3	25	25	50
10	19MCA410	MINI PROJECT USING ANDROID/AEM/IOT	MCA	-			2	-	25	25	50
TOTAL							22	23	375	375	750

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

ELECTIVES-3						
SNO	**COURSE CODE**	**COURSE**	**CREDIT DISTRIBUTION**			**TOTAL**
			L	**T**	**P**	
1	19MCA431	MOBILE APPLICATION DEVELOPMENT	3	0	0	3
2	19MCA432	AGILE TECHNOLOGIES	3	0	0	3
3	19MCA433	CLOUD COMPUTING	3	0	0	3
4	19MCA434	WIRELESS SENSOR NETWORKS	3	0	0	3
5	19MCA435	SOFTWARE PROJECT MANAGEMENT	3	0	0	3
ELECTIVES-4						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T	P	
1	19MCA441	ADOBE EXPERIENCE MANAGER	3	0	0	3
2	19MCA442	FINANCIAL MANAGEMENT	3	0	0	3
3	19MCA443	INTERNET OF EVERYTHING	3	0	0	3
4	19MCA444	SOFT COMPUTING	3	0	0	3
5	19MCA445	ARTIFICIAL NEURAL NETWORKS	3	0	0	3
ELECTIVES-5						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T	P	
1	19MCA451	SERVICE ORIENTED ARCHITECTURE AND MICRO SERVICES	3	0	0	3
2	19MCA452	ENTERPRISE RESOURCE PLANNING	3	0	0	3
3	19MCA453	PYTHON PROGRAMMING	3	0	0	3
4	19MCA454	VM WARE VIRTUALIZATION TECHNIQUES	3	0	0	3
5	19MCA455	EMBEDDED SYSTEM PROGRAMMING	3	0	0	3

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

SCHEME OF FIFTH SEMESTER (2018-21)

SNO	COURSE CODE	COURSE	BOS	CREDIT DISTRIBUTION			OVERALL CREDITS	CONTACT HOURS WEEKLY	MARKS		
				L	T/SDP	P			CIE	SEE	TOTAL
1	20MCA51	PROGRAMMING USING C#.NET	MCA	4	0	0	4	4	50	50	100
2	20MCA52	SOFTWARE QUALITY & TESTING	MCA	3	0	0	3	3	50	50	100
3	20MCA53X	ELECTIVES – 6	MCA	4	0	0	4	4	50	50	100
4	20MCA54X	ELECTIVES – 7	MCA	4	0	0	4	4	50	50	100
5	20MCA55X	ELECTIVES – 8	MCA	4	0	0	4	4	50	50	100
6	20MCAL56	PROGRAMMING USING C#.NET LAB	MCA	0	0	1.5	1.5	3	25	25	50
7	20MCAL57	SOFTWARE QUALITY AND TESTING LAB	MCA	0	0	1.5	1.5	3	25	25	50
8	20MCA58	MINI PROJECT USING .NET, C# AND SOFTWARE TESTING	MCA	-			3	3	50	50	100
TOTAL							**25**	28	350	350	700

L -Lecture (1 hour), T/SDP-Tutorial/SKILL DEVELOPMENT ACTIVITY (2 hours), P-Practical (2 hours) *Non credit Mandatory course

ELECTIVES-5						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T/SDP	P	
1	20MCA531	DATA SCIENCE	4	0	0	4
2	20MCA532	OBJECT ORIENTED MODELLING AND DESIGN	4	0	0	4
3	20MCA533	PATTERN RECOGNITION	4	0	0	4
4	20MCA534	PARALLEL PROGRAMMING	4	0	0	4
5	20MCA535	SEARCH ENGINE OPTIMIZATION	4	0	0	4

ELECTIVES-6						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T/SDP	P	
1	20MCA541	WEB DESIGN AND HTML5	4	0	0	4
2	20MCA542	BIG DATA ANALYTICS USING HP VERTICA	4	0	0	4
3	20MCA543	INFORMATION RETRIEVAL AND SECURITY	4	0	0	4
4	20MCA544	PERVASIVE COMPUTING	4	0	0	4
5	20MCA545	ECONOMICS FOR SOFTWARE	4	0	0	4

ELECTIVES-7						
SNO	COURSE CODE	COURSE	CREDIT DISTRIBUTION			TOTAL
			L	T/SDP	P	
1	20MCA551	MACHINE LEARNING TECHNIQUES	4	0	0	4
2	20MCA552	CRYPTOGRAPHY AND NETWORK SECURITY	4	0	0	4
3	20MCA553	MIDDLEWARE TECHNOLOGIES	4	0	0	4
4	20MCA554	PRINCIPLES OF DISTRIBUTED	4	0	0	4
5	20MCA555	SYSTEM SIMULATION AND MODELING	4	0	0	4

L -Lecture (1 hour), T/ SDP –Tutorial / SKILL DEVELOPMENT ACTIVITY (2 hours), P-Practical (2 hours)

*Non credit Mandatory course

SCHEME OF SIXTH SEMESTER (2018-21)

S NO	COURSE CODE	COURSE	BOS	CREDIT DISTRIBUTION			OVERALL CREDITS	CONTACT HOURS WEEKLY (THEORY)	CONTACT HOURS WEEKLY (LAB)	MARKS		
				L	T/ SD P	P				CIE	SEE	TOTAL
1	20MCA61	INTERNSHIP PROJECT	MCA	-			17	-	-	150	150	300
2	20MCA62	SEMINAR - 2	MCA	-			02	-	-	50	50	100
TOTAL							**19**	-	-	200	200	400

L -Lecture (1 hour), T-Tutorial (2 hours), P-Practical (2 hours) *Non credit Mandatory course

IMPORTANT NOTE:

The same 2018-21 scheme and syllabus is followed for 2019-22 batch of MCA as well. This will be last 3-year MCA program batch. No changes in course and credit details.

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

2-YEAR MCA : SCHEME OF FIRST SEMESTER (2020-21)

SNO	COURSE CODE	COURSE	BOS	CREDIT DISTRIBUTION			OVERALL CREDITS	CONTACT HOURS WEEKLY (THEORY)	MARKS		
				L	T/ SDA	P			CIE	SEE	TOTAL
1	20MCA11	PROGRAMMING WITH JAVA	MCA	3	0	0	3	3	50	50	100
2	20MATC12	MATHEMATICS FOR COMPUTATION	MAT	3	1	0	4	5	50	50	100
3	20MCA13	OPERATING SYSTEM WITH UNIX PROGRAMMING	MCA	3	0	0	3	3	50	50	100
4	20MCA14	COMPUTER NETWORKS	MCA	3	0	0	3	3	50	50	100
5	20MCA15	WEB PROGRAMMING	MCA	3	0	0	3	3	50	50	100
6	20MCA16	PROGRAMMING LOGIC AND DESIGN	MCA	2	1	0	3	4	50	50	100
7	20MCAL17	JAVA LAB	MCA	0	0	1.5	1.5	3	25	25	50
8	20MCAL18	UNIX LAB	MCA	0	0	1.5	1.5	3	25	25	50
9	20MCAL19	COMPUTER NETWORKS LAB	MCA	0	0	1	1	2	25	25	50
10	20MCAL110	WEB PROGRAMMING LAB	MCA	0	0	1	1	2	25	25	50
11	20HSSC111	LIFE SKILLS FOR PROFESSIONALS - 1	HSS	Mandatory course			1	-	25	25	50
		TOTAL		15	1	7	**25**	33	425	425	850

L -Lecture (1 hour), T/SDA-Tutorial / Skill Development Activity (2 hours), P-Practical (2 hours)
*Non credit Mandatory course

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

SCHEME OF SECOND SEMESTER (2020-21)

SNO	COURSE CODE	COURSE	BOS	CREDIT DISTRIBUTION			OVERALL CREDITS	CONTACT HOURS WEEKLY (THEORY)	MARKS		
				L	T / SDA	P			CIE	SEE	TOTAL
1	20MCA21	ADVANCED JAVA AND ENTERPRISE ARCHITECTURE	MCA	3	0	0	3	3	50	50	100
2	20MCA22	DATA STRUCTURES USING C++	MCA	2	1	0	3	4	50	50	100
3	20MCA23	SOFTWARE ENGINEERING & TESTING	MCA	3	0	0	3	3	50	50	100
4	20MCA24	DATABASE SYSTEMS	MCA	3	0	0	3	3	50	50	100
5	20MCA25X	ELECTIVES-1	MCA	3	0	0	3	3	50	50	100
6	20MCA26X	ELECTIVES-2	MCA	3	0	0	3	3	50	50	100
7	20MCAL27	ADVANCED JAVA LAB	MCA	0	0	1.5	1.5	3	25	25	50
8	20MCAL28	DATA STRUCTURES LAB	MCA	0	0	1.5	1.5	3	25	25	50
9	20MCAL29	SOFTWARE TESTING LAB	MCA	0	0	1	1	2	25	25	50
10	20MCAL210	DATABASE SYSTEMS LAB WITH MINI PROJECT	MCA	0	0	2	2	3	50	50	100
11	20HSSC211	LIFE SKILLS FOR PROFESSIONALS - 2	HSS	-			1	-	25	25	50
TOTAL				17	1	6	**25**	30	450	450	900

L -Lecture (1 hour), T/SDA-Tutorial / Skill Development Activity (2 hours), P-Practical (2 hours)
*Non credit Mandatory course

ELECTIVES-1 (BUSINESS ANLAYTICS TRACK)							
SNO	COURSE CODE	COURSE	**BOS**	CREDIT DISTRIBUTION			TOTAL
				L	T/SDP	P	
1	20MCA251	DATA WAREHOUSING AND DATA MINING	MCA	3	0	0	3
2	20MCA252	ROBOTIC PROCESS AUTOMATION	MCA	3	0	0	3
3	20MCA253	ENTERPRISE RESOURCE PLANNING	MCA	3	0	0	3
4	20MCA254	BUSINESS INTELLIGENCE AND DATA ANALYTICS	MCA	3	0	0	3
5	20MCA255	COMPUTATIONAL STATISTICS	MCA	3	0	0	3

ELECTIVES-2 (NETWORK SECURITY TRACK)							
SNO	COURSE CODE	COURSE	**BOS**	CREDIT DISTRIBUTION			TOTAL
				L	T/SDP	P	
1	20MCA261	CYBER SECURITY AND CYBER LAW	MCA	3	0	0	3
2	20MCA262	DIGITAL FORENSICS	MCA	3	0	0	3
3	20MCA263	CRYPTOGRAPHY & NETWORK SECURITY	MCA	3	0	0	3
4	20MCA264	INFORMATION RETRIEVAL & SECURITY	MCA	3	0	0	3
5	20MCA265	WIRELESS SENSOR NETWORKS	MCA	3	0	0	3

AGENDA 3: CO, PO, Credit and RBT levels requirements and mapping verification

There are 11 Program Outcomes (PO's) mapped with the graduate attributes for the MCA Programme.

CO'S	Graduate Attributes	Program Outcomes (POs)
1	Scholarship of Knowledge	**PO1:** Understand and apply the fundamental principles of mathematics, science, knowledge of computer science for solving complex problems.
2	Critical Thinking	**PO2:** Identify, analyze, and formulate the real world requirements in computing
3	Problem Solving	**PO3:** Design and estimate the computer system components, sub-systems and appropriate tools for developing solutions for complex
4	Research Skill	**PO4:** Use latest tools and technique needed for hard computing practices.
5	Usage of modern tools	**PO5:** Use right platform on design and execution for performance.
6	Collaborative and Multidisciplinary work	**PO6:** Customize and fit software solutions to the society and environment.
7	Project Management and Finance	**PO7:** Work effectively as an individual as well as a member / leader in a team.
8	Communication	**PO8:** Understand and commit ethical, cyber regulations and management practices in computing field for managing software projects from diverse environments.
9	Life-long Learning	**PO9:** Understand the societal, environmental, health, legal, ethical issues and its impact with respect to computing and professional practice.
10	Ethical Practices and Social Responsibility	**PO10:** Discover openings and use novel thoughts for creating value and wealth for the betterment of the individual and society.
11	Independent and Reflective Learning	**PO11:** Design, execute and interpret the software with real time data and synthesis the information to reach suitable conclusions.

The aforementioned POs are mapped with the Course Outcomes in each course (CO) by using the following mapping table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-

The correlated values 3, 2 and 1 refer the degree of correlation of the CO-PO mapping. The enumerated values are labelled as High (3), Medium (2), and Low (1).

The COs is written using Revised Bloom's Taxonomical (RBT) levels to ensure the attainment.

Every course CO-PO mappings are verified and ensured by the faculty members and expert members of BOS.

AGENDA 4: Equivalence courses for change of Scheme.

For 2018-21 batch, 3-Year MCA Program, the credits were standardized for labs, mini projects and seminars. In addition to this, all electives were made as the 4 credit courses in 5th Semester by considering its importance and complexity. The credits were equally distributed in I, II, III and IV semesters, semester V has 25 credits and semester VI has 19 credits, so totally 132 credits.

In 2-Year MCA program, every semester credits are equally distributed as 25 credits. Therefore totally 100 credits for the 2-Year MCA program.

As per the new regulations from VTU, in L:T/SDP:P structure is followed, the self-study (S) components is removed from 2018-19 batch 3rd semester onwards.

Among the elective groups, few courses like data science and big data analytics were exchanged to make the students to avail the trendy courses in their due time.

AGENDA 5: Innovative Ideas from Board Members

The Board of Members gave many ideas and suggestions with their enthusiastic involvement during the critical period of C-19. The suggestions by Mr. Pravin Kumar Sinha (1), VTU Nominee (2020-22) is as follows:

I looked at the course syllabus. Considering the 2 years timeline, the proposed syllabus looks fine. However, I had few suggestions:

a) 20MCA32 - MACHINE LEARNING TECHNIQUES

This subject has to be made as a compulsory subject.

b) "DATA WAREHOUSING AND DATA MINING" or "CLOUD COMPUTING" to be included in the curriculum either as a core or electives.

c) Big Data Processing subject can be added as an elective.

d) More labs to be added.

Rest of the subject looks good to me as we have core subjects like Operating Systems, Computer Networks, DBMS, DS, ADA etc. covered.

Please find the attached file with scanned signature.

Pravin Kumar Sinha
Sr. Software Engineer,

Horton Works, Bangalore.

The suggestions by Dr. S. Jagannatha (2), Professor, MSRIT, Bangalore, are as follows:

Following are the some of the observation and suggestion for the Scheme of MCA syllabus for the academic year 2020-2021.

1. *Bridge course may be introduced for Non Computer Science Students:*
    i. *Basics of Programming, C, and object oriented Features.*
2. *UNIX and Operating Systems may be combined.*
3. *Lab may be introduced 1 credit instead of 1.5 credits.*
4. *Database System can be implemented with NoSQL(Mongo DB)*
5. *Some of the latest technology like: Machine Learning using Jupiter, Predictive Technique, R, IOT, BIG DATA Analytics with SPARK, DevOps, Mobile Application Development, Hadoop. These courses may be intruded in the syllabus.*
6. *Practical implementation of Block Chain technology, NETWORK SECURITY, Cloud, IOT, Mean Stalk development, Data Science, AI and USER INTERFACE AND USER EXPERIENCE DESIGN may be incorporate in Syllabus and it is essential.*
7. *Web Programming frameworks: node js, angular js, react js may be accommodated in the web programming syllabus.*
8. *Dynamic web Programming with PHP may be incorporated in the 2sem.*
9. *Semester – V & VI curriculum structure & scheme is fine for the 2018-21 MCA batch.*

From,
Dr. S. Jagannatha
Professor,
Dept of MCA,
M S Ramaiah Institute of Technology, Bangalore 560054

The suggestions by Dr.Balaji (3), JD – CDAC are as follows:

1. *The overall credits for practical (labs) may be increased and brought closer to the theory level.*
2. *In Semester 1, a student has to practice Java, UNIX, Networks and Web labs, which I think is overloaded. Web can be moved to Semester 2, where it can fit well with Advanced Java and Database Systems also. In that Scenario, Data structures from Semester 2 could be promoted to Semester 1.*
3. *In Semester 3, Python lab is having 2 credits for theory - May be this could be reduced or removed and redistributed elsewhere.*
4. *In Semester - 4, do you really need 2 electives - as the students will be devoting their full time to internship and job opportunities? Also do they need to put in 6 hours a week in classroom?*
5. *Most of the electives in elective - 3, are pre-requisites for Machine Learning course. Topics listed there - AI, NN, Reinforced Learning could be brought into the main course and renamed as "AI and Machine Learning". "Deep Learning" can then become an elective in the subsequent semester.*
6. *Semester – V & VI curriculum structure & scheme is fine for the 2018-21 MCA batch.*

From
Dr. Balaji Rajendran
Joint Director
Centre for Development of Advanced Computing (C-DAC)
No.68, Electronics City
Bengaluru 560 100, India

The suggestions by Dr.Vijaykumar (4), HOD – BMSCE, are as follows:

1) As per AICTE/Univ. guidelines, Total credits must be 88. That is 22 per semester on average.

2) Semester I: There is no clarity on name of th Subject: Logics of programming, may be renamed suitably

3) Elective subjects must be carefully placed based on prerequisites (For. eg. in III Sem. ML (core) is a prerequisite for DL,ANN, AI. However, all are kept in the same semester. It is good to prepare a prerequisite courses for each elective.

4) It is advised not to allot any theory courses in IV semester, except courses like Seminar apart from Project work. This is to fulfill company requirement as they expect full time project work.

5) VTU statutes for autonomous college are to be considered while preparing scheme.

Rest of the things look good.

Dr. Vijayakumar Kadappa
Dept. of Computer Applications,
BMS College of Engineering, Bangalore-560019

From placement aspects, Prof. Gurucharan Singh and Mr. Manish Ranjan participated for the BOS, gave their valuable comments to all required full-stack coverage of contents in all essential technical courses.

Justifications:

As per VTU norms of credit structure, the overall credits are calculated as per L: T/SDP: P ratio (hours/week) for theory and lab courses. And moreover total credits of MCA program is brought down to 100 from 132 and earlier 150, subsequently the course duration is minimized to 2 Years.

The curriculum is structured to have both lab and theory courses in the same semester, to ease the learning & teaching process. The splits may lead to difficult in hands-on skills and concept learning.

The comments related to semester – I & II are incorporated for the immediate effect.

AGENDA 6: List of Approved Examiners for the Academic Year 2020-21

Sl.No.	Name/Designation/Complete Address
1	Prof. Lakshmi Narayan B N/ Asst. professor/ Nitte Meenakshi, Bangalore
2	Prof. Diwakar/ Asst. Professor/ Cambridge Institute of Technology K.R. Puram, Bangalore – 560036
3	Prof. Vasanth C Bhagawat/ Assoc. Prof.,/ AMC Engineering College, Dept. of MCA,18th K.M. Bannerghatta Main Road, Bengaluru, Karnataka 560083
4	Prof. Vijayalakshmi/ Asst. Professor/ Cambridge Institute of Technology K.R. Puram, Bangalore – 560036
5	Prof. Divya TL/Assistant Professor,Department of MCA/RV College of Engineering, Mysore Road, Bengaluru
6	Prof. S.P. Srikanth/Assistant Professor/Department of CSE, Sambhram Institute of Technology, Bengaluru
7	Prof. Bhavana K/ASC Degree College, Department of BCA, Bangalore
8	Prof. Dharamvir, Assistant Professor, The Oxford College of Engineering, Bommanahalli, Hosur Road, Bengaluru- 560 068
9	Prof. Rajesh, Assistant Professor, AMC Engineering College, Bannerghatta Road, Bengaluru - 560 083
10	Dr. R. Murugan/ Professor/ Department of Information Science & Engineering, T. John Institute of Technology, Gottigere, Bannerghatta Road, Bangalore - 560 083
11	Dr. G. Komarasamy / Associate Professor / Department of CSE, School of Engineering and Technology, Jain University, Bangalore- 562112
12	Dr. Mouleeswaran / Associate Professor / Department of CSE, Dayananda sagar University, Kudlu gate, Hongasandra village, Hosur main Road, Bangalore- 560068
13	Prof. Pradeep M, Asst.Prof, Dept. of CSE, MS Engineering College, Navarathna Agrahara, Sadahalli PO, Off Bengaluru International Airport, Bangalore - 562110
14	Prof. Abhay Kumar, Asst.Prof, Dept of MCA, MVJ College of Engineering, Near ITPB, Channasandra, Bangalore - 520067
15	Prof. Sindhu S,Assistant Professor, Department of MCA, Cambridge Institute of Technology, Jai Bhuvaneshwari Layout Rd, SR Layout, Chikkabasavanapura, Krishnarajapura, Bengaluru, Karnataka 560036
16	Prof. V.L. Helen Josephine, Department of MCA, CMR Institute of Technology, 132 AECS Layout

	ITPL Main Road, Kundalahalli Bangalore 560037
17	Prof. Supriya N. S, Department of MCA, MVJ College Of Engineering, Channasandra Main Road, Near ITPB, Whitefield, Kadugodi, Bengaluru- 560067
18	Prof. Manjula C M Prasad, Department of MCA, PES South Campus Hosur Rd, Konappana Agrahara, Electronic City, Bengaluru- 560100
19	Prof. Mariyan Richard A,, Department of MCA, Nitte Meenakshi Insitute of Technology, Bangalore
20	Mr. Rajakumar Arul, Asst. Prof, Dept of CSE, Amrita Vishwa Vidyapeetham, Kasavanahalli, Carmelaram P.O. , Bengaluru - 560 035
21	Prof. Vibha M B, Asst.Prof. Dayananda Sagar College of Engineering, Shavige Malleshwara Hills, 1st Stage, Kumaraswamy Layout, Bengaluru
22	Prof. D. Ramya Dorai, Assoc. Prof, Dept of CSE, T.John Institute of Tech., Bennarghatta Road, Bangalore.

AGENDA 7: Approval for Digital Initiative

As an initial step, hereafter the quizzes will be conducted using the mobile apps for the students. The mobile apps such as quizizz (https://quizizz.com) or Kahoot will be used. It will be demonstrated within the department staffs. It also eases the analysis task after student's performances.

Google classroom for student's assignments, Quizzes conducted through Google forms. Students project reviews can be taken through Cisco Webex / zoom app.

In recent days, many digital tools for teaching, learning and evaluating purposes are used to facilitate remotely.

AGENDA 8: Suggestion for Open Source & Open Standard Practices

In Semester-1, UNIX, C, Java programming, PHP and MySQL are introduced.

In Semester-2, Angular, C++, Selenium is introduced.

In Semester-3, Python and R are introduced.

AGENDA 9: Recommendations of the Board

In Agenda-4 all refinements are documented in detail. To highlight a few the following recommendations were strongly suggested by the BOMs.

1. Programming Logic and Design as a new subject is recommended and accepted by all in BoS, the course introduces algorithm, flowchart and control structure formation irrespective of all languages by using C.
2. Operating system concepts allied with UNIX commands and programming is accepted by all.
3. In web programming course, PHP and MySQL are given good coverage along with HTML specification, CSS and Javascript.
4. Database systems course introduces the NoSQL database. Then application-oriented mini project is recommended along with database systems lab. The students will give sufficient hours and tutors guidance to enhance their project skills.
5. Advanced Java course has very good wide coverage of contents till angular framework. The lab experiments are well aligned to meet the course outcomes.
6. Data structures using C++ contents are modified as first unit purely on c++ programming essentials and remaining units cover the essential data structures. The associated lab fills the gap for covering the practical aspects.

7. In Semester-2 electives grouping are business analytics and network security related courses are offered in electives-1 and 2. The courses and its contents were appreciated.

AGENDA 10: Stakeholders feedback and considerations

The stakeholders considered are faculty members, students, parents, alumni and external experts. The comments received through course feedbacks received from students, faculty members are incorporated in the contents of respective courses. The alumni feedbacks were useful to add and offer more electives. Finally, all other external experts' advices are taken into consideration to make an effective curriculum.

Vote of thanks by Chairman of BOS

BOS – Chairman consolidated the recommendations proposed by the BOS members.

It was assured that the proposed changes will be incorporated with immediate effect.

Recommendations were signed by every member of the BOS

Vote of thanks was proposed by the Dr. K.G. Madhwaraj, Professor, MCA Department.

He conveyed his heartfelt thanks to all the members of BoS and stakeholders for their valuable inputs to make this program as a value added program.

Annexure-1: Detailed syllabus and scheme examination of 5th & 6th Semester (2018-21) after incorporating the recommendations made by the Board.

Annexture-2: Detailed syllabus and scheme examination of 1st and 2nd Semester (2020-21) after incorporating the recommendations made by the Board.