

Dr. AMBEDKAR INSTITUTE OF TECHNOLOGY, BENGALURU-56

(An Autonomous Institution, Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi)

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS(MCA)

The following documents enclosed are verified and approved.

PMM HOD-MCA 5/4/22

Dr. Chandrakanth G Pujari Dr. Chandrakanth G. Pujari, NCA, MTech, Ph.D Professor and Head, MCA Program Dr. Ambedkar Institute of Technology Bengaluru-560 056

MINUTES OF BOARD OF STUDIES MEETING – MCA BOARD VENUE : MCA Department

22th September 2016.

The Board of Studies meeting in MCA Course of Dr. Ambedkar Institute of Technology was held on 22nd September of 2016.in the Department of M.C.A., Dr. AIT Campus, Bengaluru. The following are the members of BoS meeting

SI. No	Category	Nomination of the Committee	Name of the Person
1	Head of the Department	Chairperson	Dr. L.Manjunatha . Rao Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: manjuarjun2004@yahoo.com Mob: 9341214327
		Member-1	Dr. Chandrakanth. G. Pujari Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: varuncp@rediffmail.com Mob: 9845380013
2	Internal Faculty members with various specializations	Member-2	Dr. Bharathi.S Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bharathishivu_s@yahoo.co.in Mob: 9902084476
		Member-3	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: indukarthik2009@yahoo.in Mob: 9739910995
3	Subject Experts from outside the college	Member-1	Dr. Kavya. N. P Prof & Head Dept. of M.C.A RNSIT, Bangalore e-mail: npkavya@yahoo.com mob: 9945275345
	nominated by academic council	Member-2	Dr. Poornima Nataraj Prof & Head Dept. of M.C.A DSCE, Bangalore e-mail: hod-mcavtu@dayanandasagar.edu mob: 9901644101
4	Experts from outside college nominated by VTU	Member	
5	Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-1	Mr. Ravinandan Temminova Technologies Private Ltd. Mahalakshmi Layout Bengaluru-86 Email:ravinandan.me@gmail.com

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	Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-2	Mob:9902000779 Mr. Babu Rao Senior Engineering Project Manager Aricent Technologies Bengaluru E mail:babu.damera@aricent.com	5
7	Post graduate meritorious alumnus nominated by Principal	Member	Mr. Jaideep M.S Engagement Manager Avaali Solutions Pvt. Ltd. Bengaluru Email: jaideepms@avaali.com	
8	Special Invitees	Member-1 Member-2	Mob: 9901925535 Ms. Shobha Rani. B.R Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: shobhakrishna&@gmail.com Mob: 9740098198 Ms. Malathi. P Assistant Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bfgcpm@rediffmail.com Mob: 7760880325	

The Board of Studies recommends the syllabus for MCA Programme for the academic year 2016-17 with the following suggestions through deliberations:

- Proposed the detailed syllabus for all 6 semesters of MCA program as per CBCS from the academic year 2016 - 2017 by finalizing the core and elective subjects with respect to current industry and all stake holders' requirements (as per the guide lines of ACM, IEEE -Computer Society and NBA).
- 2. Electives are offered in the light of new advancements in the field of information technology.
- 3. Proposed credit weightage for various components like lectures, tutorials, practicals, seminars, mini project and Major project for each course.
- 4. Credits for curriculum components in Master of Computer Applications programme are allotted (mathematics, management, humanities, professional core, electives, project work, and seminar) as per VTU guidelines.
- 5. Proposed the Scheme of Teaching and Examination for all six semesters of MCA programme.
- 6. Proposed the Course Outcomes (COs) as per the Outcome Based Education of NBA.
- 7. The BoS has recommended the detailed syllabus, rules and regulations, scheme of teaching and examination for all the six semesters.
- 8. The BoS has recommended the I and II semester MCA syllabus
- The Syllabus was finalized by incorporating the suggestions made by the honorable members.

The BoS meeting was concluded with vote of thanks address by the chairman.

BOS MEETING 22ND SEPTEMBER 2016

Signature of Participants

1.	Category	Nomination of the Committee	Name of the Person	Signature
	Professor and Head of the Department	Chairperson	Dr. L.Manjunatha . Rao Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: manjuarjun2004@yahoo.com Mob: 9341214327	Longh
		Member-1	Dr. Chandrakanth. G. Pujari Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: varuncp@rediffmail.com Mob: 9845380013	gm 12/9/16
	Internal Faculty members with various specializations	Member-2	Dr. Bharathi.S Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bharathishivu_s@yahoo.co.in Mob: 9902084476	12/2/9/16
		Member-3	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: indukarthik2009@yahoo.in Mob: 9739910995	J. Jalalie
	Subject Experts from	Member-1	Dr. Kavya. N. P Prof & Head Dept. of M.C.A RNSIT, Bangalore e-mail: npkavya@yahoo.com mob: 9945275345	12-22/9/2026
	outside the college nominated by academic council	Member-2	Dr. Poornima Natarajø Prof & Head Dept. of M.C.A DSCE, Bangalore e-mail: hod- mcavtu@dayanandasagar.edu mob: 9901644101	poormia
	Experts from outside college nominated by VTU	Member	Communi Conted.	to vou

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BOS MEETING 22ND SEPTEMBER 2016

Signature of Participants

Category	Nomination of the Committee	Name of the Person	Signature
Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-1	Mr. Ravinandan Temminova Technologies Private Ltd. Mahalakshmi Layout Bengaluru-86 Email:ravinandan.me@gmail.com Mob:9902000779	alle .
Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-2	Mr. Babu Rao Senior Engineering Project Manager Aricent Technologies Bengaluru E mail:babu.damera@aricent.com Mob:	Ore .
Post graduate meritorious alumnus nominated by Principal	Member	Mr. Jaideep M.S Engagement Manager Avaali Solutions Pvt. Ltd. Bengaluru Email: jaideepms@avaali.com Mob: 9901925535	to from
Special Invite	Member-1	Ms. Shobha Rani. B.R Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: shobhakrishna8@gmail.com Mob: 9740098198	Blubbloom P.Molethi
Special Invitees	Member-2	Ms. Malathi. P Assistant Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bfgcpm@rediffmail.com Mob: 7760880325	P. Molethi

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MASTER OF COMPUTER APPLICATIONS MANBEDKAR INSTITUTE OF TECHNOLOGY BANGALORE-560 056

Board of Studies meeting in MCA Course of Dr. Ambedkar Institute of Technology was on 22th September 2016.at MCA Department, Dr. AIT campus, Bengaluru.

following members were present in the meeting:

Category	Nomination of the Committee	Name of the Person	Signature		
Head of the Department	Chairperson	Dr. L.Manjunatha . Rao Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: manjuarjun2004@yahoo.com Mob: 9341214327	Kank		
	Member-1	Dr. Chandrakanth. G. Pujari Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: varuncp@rediffmail.com Mob: 9845380013	9m 122/9/14		
Internal Faculty members with various specializations	Member-2	Dr. Bharathi.S Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bharathishivu_s@yahoo.co.in Mob: 9902084476	13/22/9/16		
	Member-3	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: indukarthik2009@yahoo.in Mob: 9739910995	J. 221914		
Subject Experts from	Member-1	Dr. Kavya. N. P Prof & Head Dept. of M.C.A RNSIT, Bangalore e-mail: npkavya@yahoo.com mob: 9945275345	22/9/14		
outside the college nominated by academic council	Member-2	Dr. Poornima Nataraj a Prof & Head Dept. of M.C.A DSCE, Bangalore e-mail: hod- mcavtu@dayanandasagar.edu mob: 9901644101	poorm		
Experts from outside college nominated by VTU	Member	Communis casted	to vou		
Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-1	Mr. Ravinandan Temminova Technologies Private Ltd. Mahalakshmi Layout Bengaluru-86 Email:ravinandan.me@gmail.com Mob:9902000779	a we		

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Category Nomination of the Committee Name of the Pers		Name of the Person	Signat
Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-2	Mr. Babu Rao Senior Engineering Project Manager Aricent Technologies Bengaluru E mail:babu.damera@aricent.com Mob:	Signature
Post graduate meritorious alumnus nominated by Principal	Member	Mr. Jaideep M.S Engagement Manager Avaali Solutions Pvt. Ltd. Bengaluru Email: jaideepms@avaali.com Mob: 9901925535	J-Jmn
Second Inviteors	Member-1	Ms. Shobha Rani. B.R Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: shobhakrishna8@gmail.com Mob: 9740098198	Subban
Special Invitees	Member-2	Ms. Malathi. P Assistant Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bfgcpm@rediffmail.com Mob: 7760880325	P. Maleti

Chairman

HÓD ER OF COMPUTER APPLICATIONS BEDKAR INSTITUTE OF TECHNOLOGY BANGALORE-560 056



Ambedkar Institute of Technology, Bengaluru-56 Autonomous Institute, Affiliated to V T U, Belagavi) Nationally Accredited by NAAC with 'A' Grade

Master of Computer Applications Program Accredited by National Board of Accreditation



MCA I to VI semester Scheme (2016 – 2019)

Dr. Ambedkar Institute of Technology, Bengaluru – 560056 Master of Computer Applications

Institute - Vision and Mission VISION

To create Dynamic, Resourceful, Adept and Innovative Technical professionals to meet global challenges.

MISSION

- To offer state-of-the-art undergraduate, postgraduate and doctoral programmes in the fields of Engineering, Technology and Management.
- To generate new knowledge by engaging faculty and students in research, development and innovation leading to newer knowledge.
- To provide strong theoretical foundation to the students, supported by extensive practical training to meet industry requirements.
- To install moral and ethical values with social and professional commitment

DEPARTMENT - VISION AND MISSION

VISION

To create a quality human resource with good technical competence to face the global challenges.

MISSION

- To create a Center of Excellence through industry institute interaction.
- To prepare students for utilizing more creativity, innovativeness and leadership Qualities.
- To inculcate a sense of commitment to the students towards socio-economic development of the nation

Program Educational Objectives

- **PEO 1:** Graduates are prepared to be employed in IT industries and be engaged in learning, understanding, and applying new ideas.
- **PEO 2**: Graduates are prepared to be employed in academics and research environment.
- **PEO 3**: To provide an opportunity to students to learn the latest trends in computer technology and make them ready for life-long learning process with leadership skills and corporate social responsibilities.

Program Outcomes:

PO 1: Ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer based systems.

PO 2: Graduates will be able to demonstrate with excellent programming, analytical, logical and problem solving skills.

PO 3: Graduates will be able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability.

PO 4: An ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO 5: An ability to select modern computing tools and techniques and use them with dexterity.

PO 6: An ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude.

PO 7: An ability to appreciate the importance of goal setting and to recognize the need for life-long learning.

PO 8: Develop and maintain medium to large scale application software using theoretical and applied knowledge of software engineering and project management.

PO 9: An ability to communicate effectively.

PO 10: An ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development.

PO 11: An ability to execute the project either individually or in a group.

PO 12: An ability to become an Entrepreneur in the field of information technology to create a value and wealth for the betterment of the individual and society at large.

		I Semester								
		С	redits			Exam	Ma	rks		
Subject Code	Name of the Subject	Lecture	Tut oria 1	Practi cals	Total Credit s	Durat ion in Hours	CIE	SEE	Total Marks	
MCA11	Data structures using C	4		-	4	3	30	70	100	
MCA12	Unix Programming	4		-	4	3	30	70	100	
MCA13	Web Technologies	4		-	4	3	30	70	100	
MCA14	Computer Organization	4		-	4	3	30	70	100	
MCA15	Discrete Mathematical Structures	4		-	4	3	30	70	100	
MCAL16	Data structures using C Lab			1.5	1.5	3	50	50	100	
MCAL17	Unix Programming Lab			1.5	1.5	3	50	50	100	
MCAL18	Web Programming Lab			2	2	3	50	50	100	
	Total	20	-	5	25	24	300	500	800	

				I	I Seme	ester			
		C	redits			Exam	Ma	arks	
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
MCA21	Python Programming	4		-	4	3	30	70	100
MCA22	Object oriented programming using C++	4		-	4	3	30	70	100
MCA23	Database Management Systems	4		-	4	3	30	70	100
MCA24	Operating Systems	4		-	4	3	30	70	100
MCA25	Professional Communication & Ethics	4		-	4	3	30	70	100
MCAL26	Python Programming Lab			1.5	1.5	3	50	50	100
MCAL27	Object oriented programming using C++ lab			1.5	1.5	3	50	50	100
MCAL28	DBMS Lab			2	2	4	50	50	100
	Total	20	-	5	25	24	300	500	800

		III Semester							
		C	redits			Exam	Ma	rks	
Subject Code	Name of the Subject	Lecture	Sem inar	Practi cals	Total Credit s	Durat ion in Hours	CIE	SEE	Total Marks
MCA31	Computer Networks	4		-	4	3	30	70	100
MCA32	Java Programming	4		-	4	3	30	70	100
MCA33	Analysis and Design of Algorithms	4		-	4	3	30	70	100
MCA34	Software Engineering	4		-	4	3	30	70	100
MCA35	Elective -1	4		-	4	3	30	70	100
MCAL36	Computer Networks Lab			2	2	3	50	50	100
MCAL37	Java Programming Lab			1.5	1.5	3	50	50	100
MCAL38	Analysis and Design of Algorithms Lab			1.5	1.5	3	50	50	100
	Total	20	-	5	25	24	300	500	800

ELECTIVE-1							
MCA351	Intellectual Property Rights						
MCA352 Data Analysis using Spread Sheets							
MCA353	Operations Researc						
MCA354	Principles of User Interface Design						

		IV Semester							
		С	redits			Exam	Ma	arks	
Subject Code	Name of the Subject	Lecture	Tut oria 1	Practi cals	Total Credit s	Durati on in Hours	CIE	SEE	Total Marks
MCA41	Advanced Java Programming	4		-	4	3	30	70	100
MCA42	Software Testing and Practices	4		-	4	3	30	70	100
MCA43	Advanced Web Programming	4		-	4	3	30	70	100
MCA44	Elective-2	4		-	4	3	30	70	100
MCA45	Management Elective-3	4		-	4	3	30	70	100
MCAL46	Advanced Java Programming Lab			1.5	1.5	3	50	50	100
MCAL47	Software Testing Lab			1.5	1.5	3	50	50	100
MCAL48	Advanced Web Programming Lab			2	2	3	50	50	100
	Total	20	-	5	25	24	30 0	500	800

ELEC	CTIVE—2	MANAGEMENT ELECTIVE-3				
MCA441	Data Warehousing & Mining	MCA451	Software Project Management			
MCA442	Artificial Intelligence	MCA452	Supply Chain Management			
MCA443	Software Architecture	MCA453	Enterprise Resource Planning			
MCA444	Machine Learning	MCA454	E-commerce and Management Information System			

				V	Seme	ster			
			Credits	;		Exa	Ma	arks	
Subject Code	Name of the Subject	Lectur e	Tuto rial	Practi cals	Total Credits	m Dur atio n in Hou rs	CIE	SEE	Tota 1 Mar ks
MCA51	Object-Oriented Modeling and Design Patterns	4		-	4	3	30	70	100
MCA52	Programming Using C# & .NET	4		-	4	3	30	70	100
MCA53	Mobile Applications	4		-	4	3	30	70	100
MCA54	Elective-4	4		-	4	3	30	70	100
MCA55	Elective-5	4		-	4	3	30	70	100
MCAL56	Software Design Laboratory			1.5	1.5	3	50	50	100
MCAL57	.Net Laboratory			1.5	1.5	3	50	50	100
MCAL58	Mini Project : (Mobile Applications Development using Android/iOS/Windo ws etc.,)			2	2	3	50	50	100
	Total	20	-	5	25	24	300	500	800

	ELECTIVE-4	ELECTIVE-5					
MCA541	Cloud Computing	MCA551	Storage Area Networks				
MCA542	Web Engineering	MCA552	Mobile and Adhoc Networks				
MCA543	Service Oriented Architecture	MCA553	Cyber Security				
MCA544	Internet of things	MCA554	Big Data Analytics				
MCA545	System Simulation & Modelling	MCA555	Software Defined Networks				

Subject Code	Name of the Subject	Internal	External	Dissertation Evaluation	Viva	Total Marks	Credits
MCA61	Research Methodology	30	70	-		100	2
MCAI62	Internship & Seminar	25(I)	-	50 (I)	25(I)	100	3
MCAP63	Project Work	50(I)	-	75(I) +75 (E)	100(I+E)	300	20
2	Fotal	105	70	150	125	500	25
	Grand To	otal (I to VI	Semesters):	4500 Marks : 1	50 Credits		
: Internal	Examiner						
: Externa	l Examiner						

Guidelines:

MCA61: Research Methodology

- Students have to attend two hours of theory class on every Saturday for 26 hours.
- Students should pass both CIE and SEE theory examinations
- Students should submit an assignment as a part of CIE evaluation.
- Students should give a seminar presentation which will be a part of CIE evaluation

MCAI62: Internship

- The students shall undergo an internship for 6 weeks during the vacation soon after the 5th semester SEE.
- The internship shall be carried out in industry/R&D labs or institution.
- The student should submit the internship report to the department
- The internship viva voce examination will be conducted by the internal examination panel for 25 marks.

MCAP63: Project Work

Synopsis

- Synopsis of the project must be submitted before the end of the first month of 6th semester
- The synopsis of the project must include:
 - a) Problem formulation and literature survey.
 - b) Details of the required tools and technologies for the development of project.
 - c) Write up shall not exceed 15 pages.
- Internal assessment for synopsis presentation and evaluation of the synopsis by the internal examiner/guide is for 50 marks.

Dissertation:

• The project shall be carried out in the same institution or in industry/R&D labs based on

software tools and technologies learnt in MCA course/internship for minimum period of 16 weeks.

- Internal assessment shall be evaluated by the internal panel/guide for 50 marks.
- For continuous evaluation of project work by the internal examiner/guide with progress reports is for 50 marks and is evaluated at different phased of project work
- The internal examiners (Project Guide with at least 2 years of experience) and the external examiners shall be appointed by the authorities of the college for the final evaluation of the project.
- Internal and external examiners shall carry out the evaluation of Dissertation report for 75 marks individually.
- The project presentation and Viva-voce shall be evaluated jointly by both the internal and external examiners for 100 marks.
- The student should be encouraged to present/publish the part/outcome of the project as an article in the conferences/reputed journals.

pr. AMBEDKAR INSTITUTE OF TECHNOLOGY, BENGALURU MASTER OF COMPUTER APPLICATIONS **BOARD OF STUDIES Meeting Notice**

25-03-2017

DI. Ambedkar Institute of Technology

Dept: of Master of Compute

The MCA department is conducting the Board of Studies meeting on 30th of March 2017 at 10.30 a.m. in the Department of MCA at Dr. AIT.

Agenda:

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Review of Curriculum

The board members are requested to make it convenient to attend the meeting and contribute your academic inputs.

MINUTES OF BOARD OF STUDIES MEETING – MCA BOARD VENUE : MCA Department

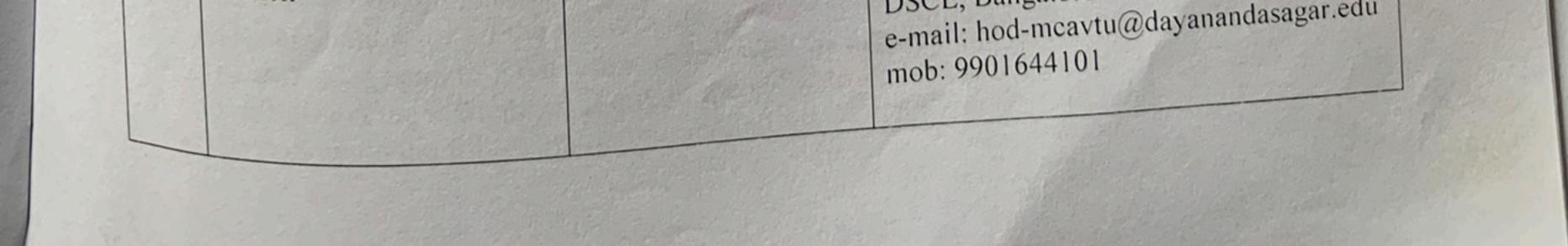
30th March 2017.

The Board of Studies meeting in MCA Course of Dr. Ambedkar Institute of Technology was held on 30th of March 2017 in the Department of M.C.A., Dr. AIT Campus, Bengaluru.

The following are the members of BoS meeting

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Sl.	Category	Nomination of the Committee	Name of the Person				
<u>No</u>	Head of the Department	Chairperson	Dr. L.Manjunatha . Rao Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: manjuarjun2004@yahoo.com Mob: 9341214327				
2.	Experts from outside college nominated by VTU	Member	Dr. K.S. Shreedhara. Professor Dept of Computer Science and Engineering UBDT College, Davanagere. Mob: 9448009306 Mailid: ks_shreedhara@yahoo.com				
	Internal Faculty members with various specializations	Member-1	Dr. Chandrakanth. G. Pujari Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: varuncp@rediffmail.com Mob: 9845380013				
2		Member-2	Dr. Bharathi.S Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bharathishivu_s@yahoo.co.in Mob: 9902084476				
		Member-3	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: indukarthik2009@yahoo.in Mob: 9739910995				
		Member-1	Dr. Kavya. N. P Prof & Head Dept. of M.C.A RNSIT, Bangalore e-mail: npkavya@yahoo.com mob: 9945275345				
3	Subject Experts from outside the college nominated by academic council	Member-2	Dr. Poornima Nataraj Prof & Head Dept. of M.C.A DSCE, Bangalore				

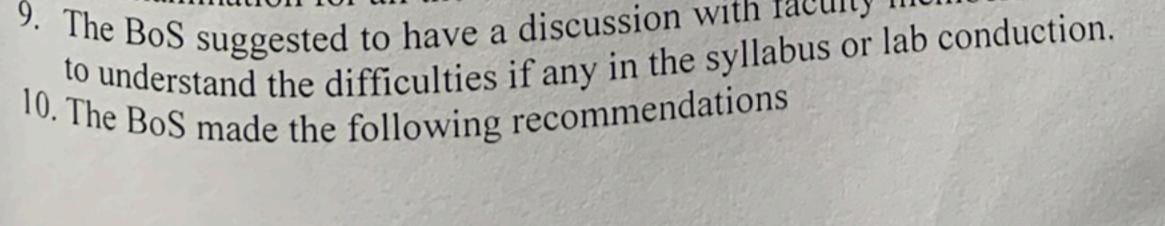


Category	Nomination of the Committee	Name
Representative from industry/Corporate industry/Corporate sector/allied area relating to placement nominated by academic council	Member-1	Name of the Person Mr. Ravinandan Temminova Technologies Private Ltd. Mahalakshmi Layout Bengaluru-86 Email:ravinandan.me@gmail.com
Representative from ndustry/Corporate sector/allied area relating to blacement nominated by academic council	Member-2	Mob:9902000779 Mr. Babu Rao Senior Engineering Project Manager Aricent Technologies Bengaluru E mail:babu.damera@aricent.com Mob:
Post graduate meritorious dumnus nominated by Principal	Member	Mr. Bhaskar Assistant Professor Maharanis Science College Palace Road, Bengaluru-1. Mob:9845382114
	Member-1	Ms. Shobha Rani. B.R Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: shobhakrishna8@gmail.com Mob: 9740098198
Special Invitees	Member-2	Ms. Malathi. P Assistant Professor, Dept. of M.C.A

Dr. A.I.T,Bangalore-56 e-mail: bfgcpm@rediffmail.com
Mob: 7760880325

The Board of Studies recommends the syllabus for MCA Programme for the academic year 2017-18 with the following suggestions through deliberations:

- 1. Proposed the detailed syllabus for all 6 semesters of MCA program as per CBCS from the academic year 2016 - 2017 by finalizing the core and elective subjects with respect to current industry and all stake holders' requirements (as per the guide lines of ACM, IEEE -Computer Society of India and NBA).
- 2. the syllabus has been framed with equal weightage of credits to the three components: core academics, industry requirement, and research orientation 3. Electives are offered in the light of new advancements in the field of information technology.
- 4. Proposed credit weightage for various components like lectures, tutorials, practicals, seminars, mini project and Major project for each course.
- 5. Credits for curriculum components in Master of Computer Applications programme are allotted (mathematics, management, humanities, professional core, electives, project work,
- Proposed the Scheme of Teaching and Examination for all six semesters of MCA programme.
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- Proposed the Course Outcomes (COs) as per the Outcome Based Education of NBA.
 The second second
- 8. The BoS has recommended the detailed syllabus, rules and regulations, scheme of teaching 9. The BoS suggested to have a discussion with faculty members who had handled I semester



Machine Learning (MCA444) can be introduced as an elective

introduced as a pre-requisite for Internet of Things (MCA544).

Internship and seminar (MCA62) marks to be increased to 100

Project Work (MCA63) viva will be evaluated for 100 marks

The BoS meeting was concluded with vote of thanks address by the chairman.

11. The BoS has recommended the I to VI semester MCA syllabus

ADA(MCA33) will have a credit of 1.5 Exclusive seminar component to be removed in the III semester

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members.

Applications

 2 hours of lab session and 1 hour of tutorial for a computer networks (MCA31)
 Ling to 2 credits in semester 3. totaling to 2 credits in semester 3.

Elective Fuzzy Logic to be replaced with Artificial Intelligence (MCA442)

Fuzzy Logic can be merged within Machine Learning (MCA444) and can be

Software Design Lab (MCAL56) can have 1.5 credits and 2 credits for Mobile

• Project Work Dissertation (MCA63) will be evaluated for 150 marks in the external

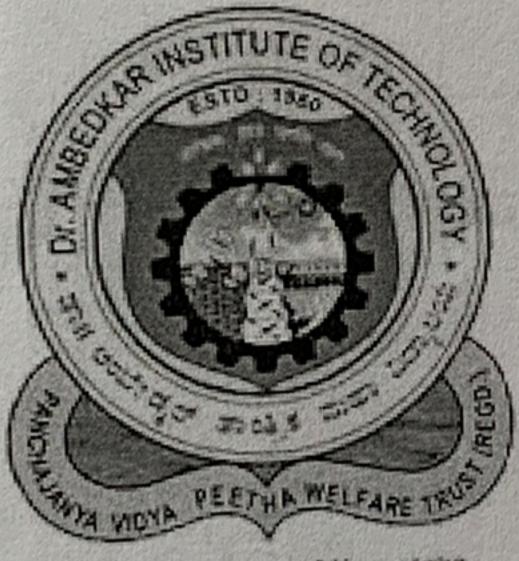
12. The Syllabus was finalized by incorporating all the suggestions made by the honorable

MASTER OF COMPUTER APPLICATIONS Dr AMBEDICAP INSTITUTE OF TEOUNOLOGIC Dr. AMBEDKAR INSTITUTE OF TECHNOLOGY BANGALORE-560 056

pr. Ambedkar Institute of Technology, Bengaluru-56

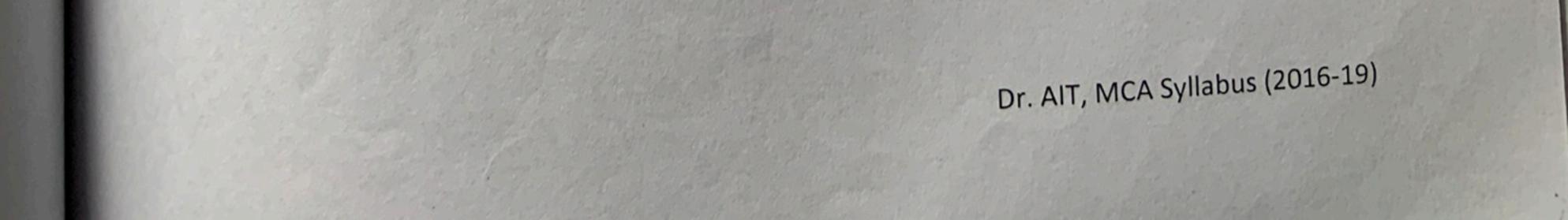
An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications (Autonomous)

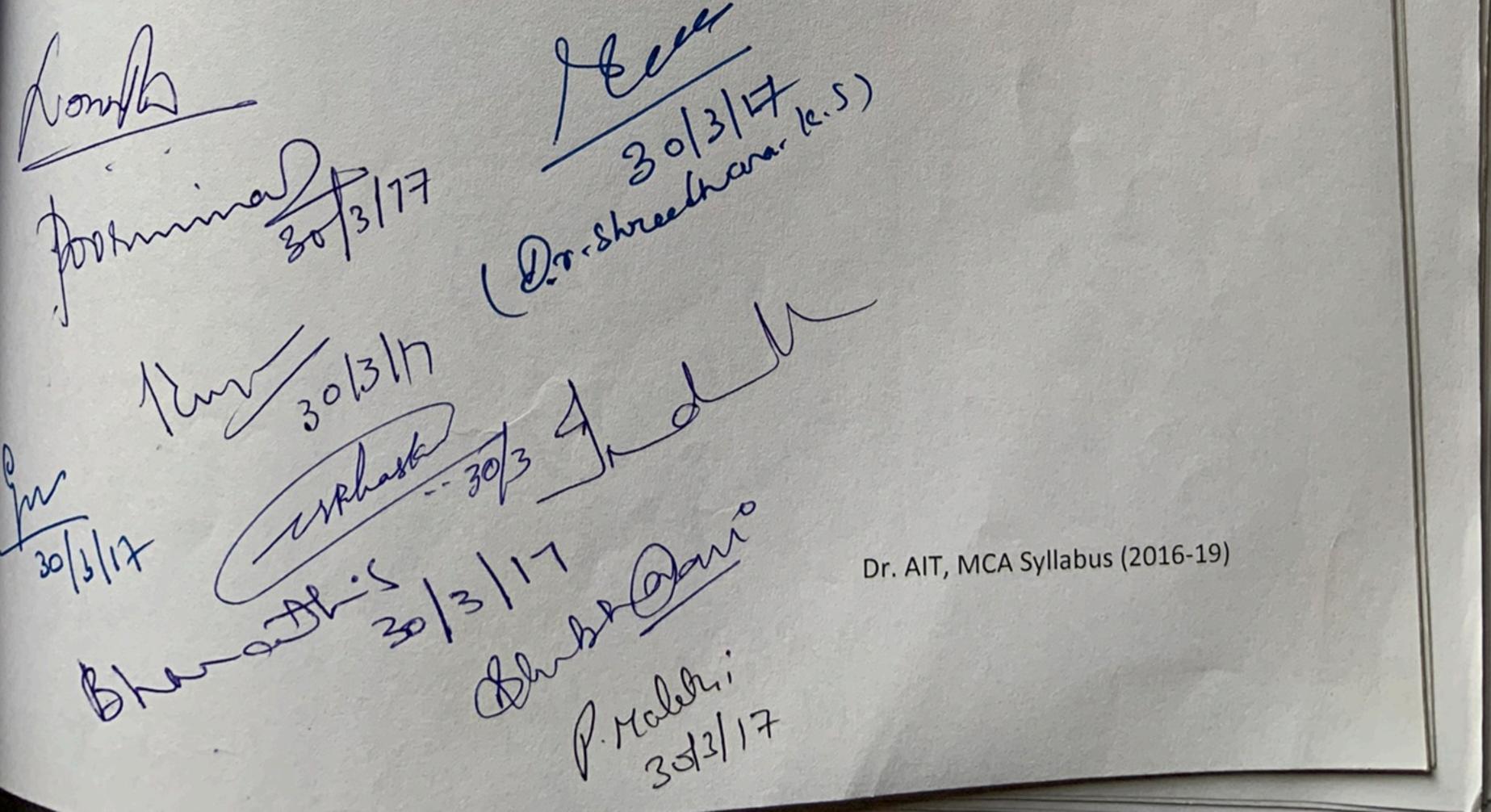


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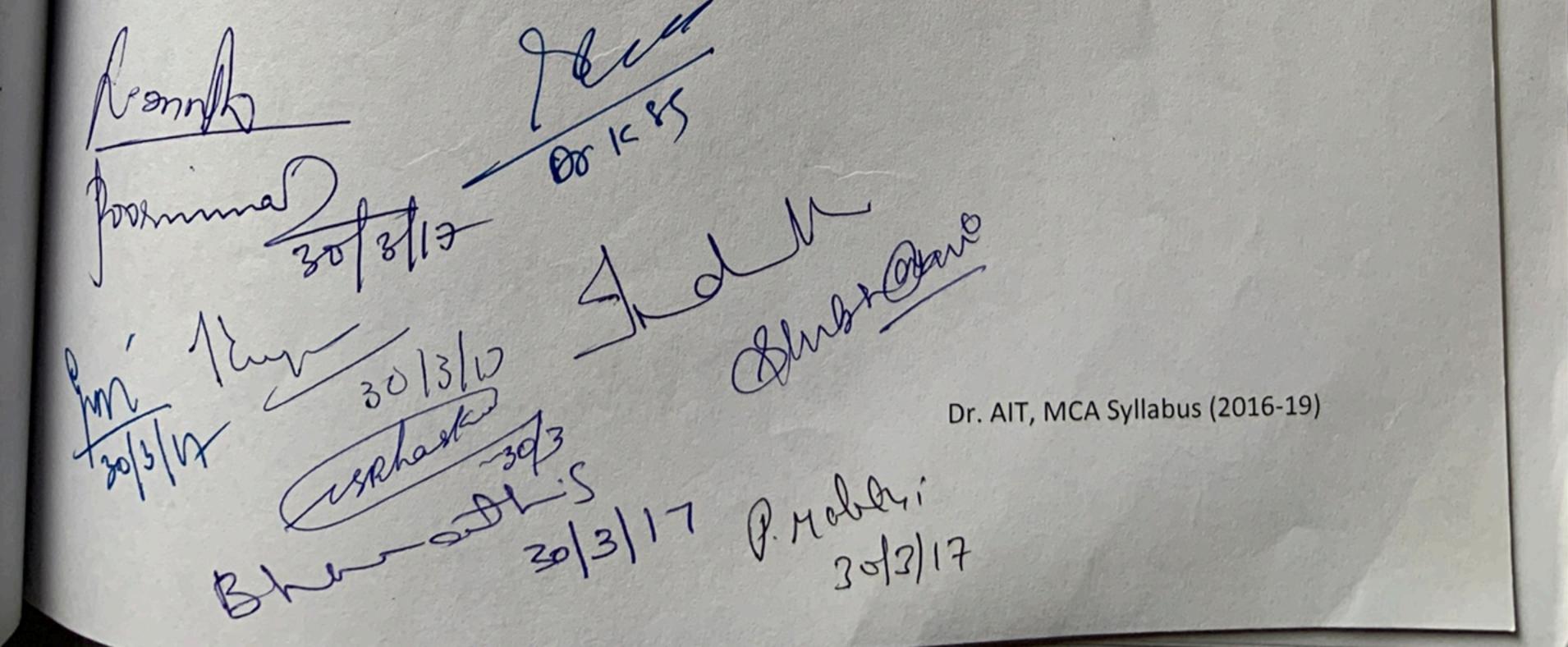
MCA Syllabus (2016 – 2019)



		C	redits		I Semes	ter			
. at	Name of the	1 A Stand States	All all and the			Exam	Ma	arks	
subject code	Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in	CIE	SEE	Total
	Data structures	4				Hours		SEE	Marks
ICA11	using C				4	3	30	70	
CA12	Unix Programming	4	-		4	Contraction of the second		10	100
	Web		de Alantia		4	3	30	70	100
ICA13	Technologies	4		- 11	4	3	30	70	100
ICA14	Computer Organization	4			4	3	30	70	100
CA15	Discrete Mathematical Structures	4		-	4	3	30	70	100
								10	100
CAL16	Data structures using C Lab			1.5	1.5	3	50	50	100
CAL17	Unix Programming Lab			1.5	1.5	3	50	50	100
CAL18	Web Programming Lab			2	2	3	50	50	100
	Total	20		5	25	24	300	500	800

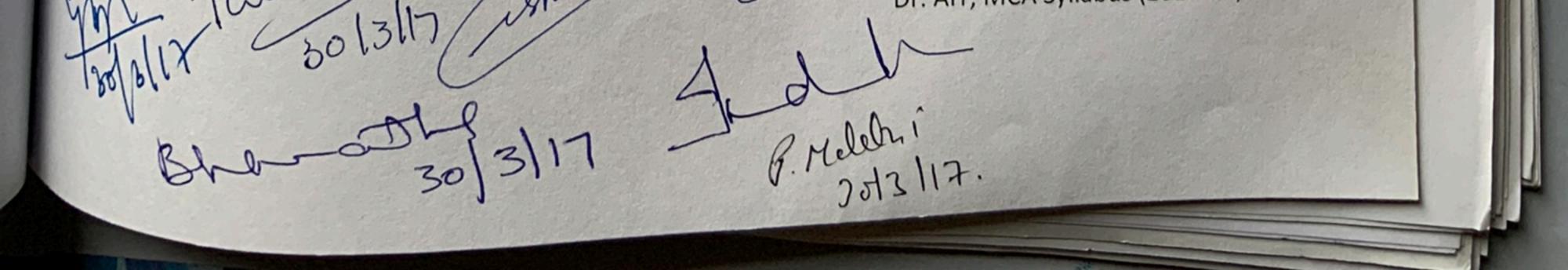


			redits		II Seme	ster		and the second							
	Name of the	CALL AND	realts	and the second	The states	France									
_{subject} Code	Subject	Lecture	Tuto rial	Practi cals	Total Credits	Exam Durati on in	CIE	see	Total						
NCA21	Python Programming	4			4	Hours			Marks						
MCA22	Object oriented				4	3	30	70	100						
	programming using C++	4				3	30	70	100						
NCA23	Database Management Systems	4		-	4	3	30	70	100						
MCA24	Operating Systems	4		-1111 -1111 -1111	4	3	30	70	100						
MCA25	Professional Communication & Ethics	4			4	3	30	70	100						
ICAL26	Python Programming Lab			2	2	3	50	50	100						
CAL27	Object oriented programming using C++ lab			1.5	1.5	3	50	50	100						
CAL28	DBMS Lab			1.5	1.5	3	50	50	100						
	Total	20	-	5	25	24	300	500	800						



		III Semester Credits										
_{Subject} Code	Name of the Subject	Lecture	Sem inar	Practi	-otal	Exam Duratio		larks				
NCA31	Computer Networks	4		cals -	Credits	n in Hours	CIE	SEE	Total Marks			
MCA32	Java				4	3	30	70	100			
	Programming Analysis and	4			4	3	30	70	100			
MCA33	Design of Algorithms	4			4	3	30	70				
MCA34	Software Engineering	4		-	4			1993 F	100			
	Elective -1				4	3	30	70	100			
MCA35		4				3	30	70	100			
CAL36	Computer Networks Lab			2	2	3	50	50	100			
CAL37	Java Programming Lab			1.5	1.5	3	50	50	100			
CAL38	Analysis and Design of Algorithms Lab			1.5	1.5	3	50	50	100			
AS39	Seminar on ICT		1		1		50	-	50			
	Total	20	<u></u>	5	25	24	300	500	800			

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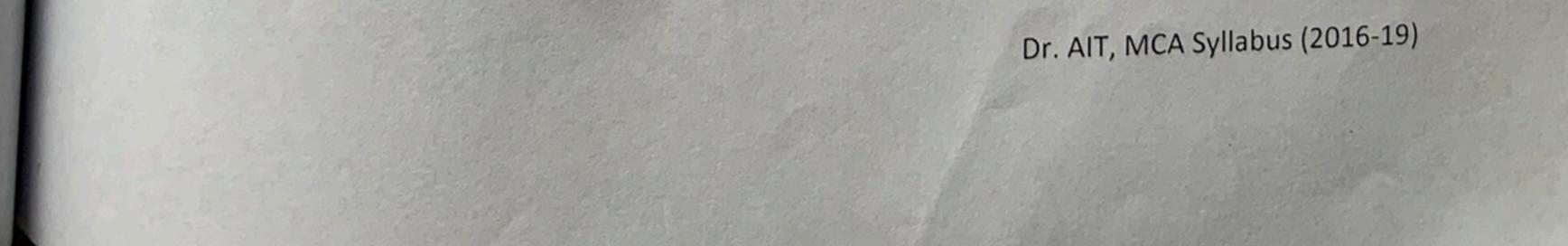
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	ELECTIVE-1
MCA351	Intellectual Property Rights
MCA352	
MCA353	Cyber Security
MCA354	Operations Research
MCAUUT	Data Analysis using Spread Sheets

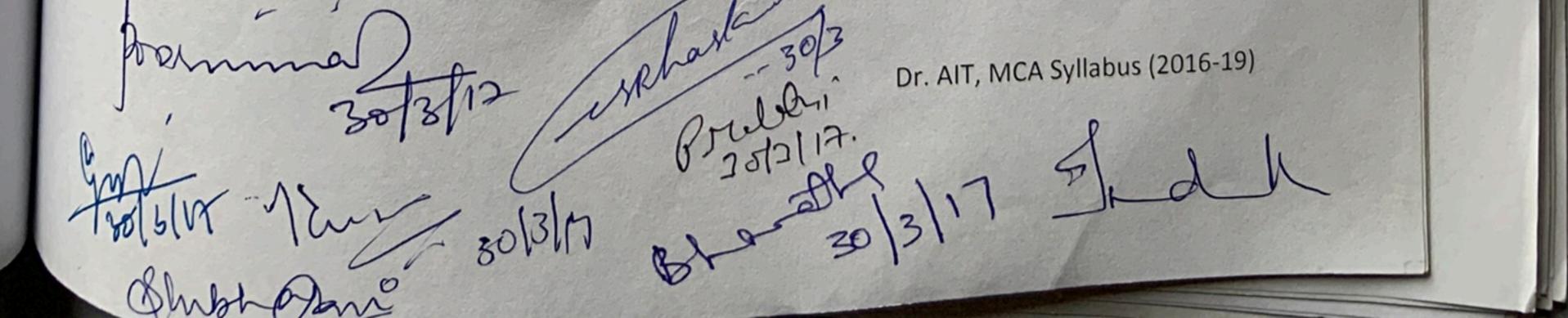
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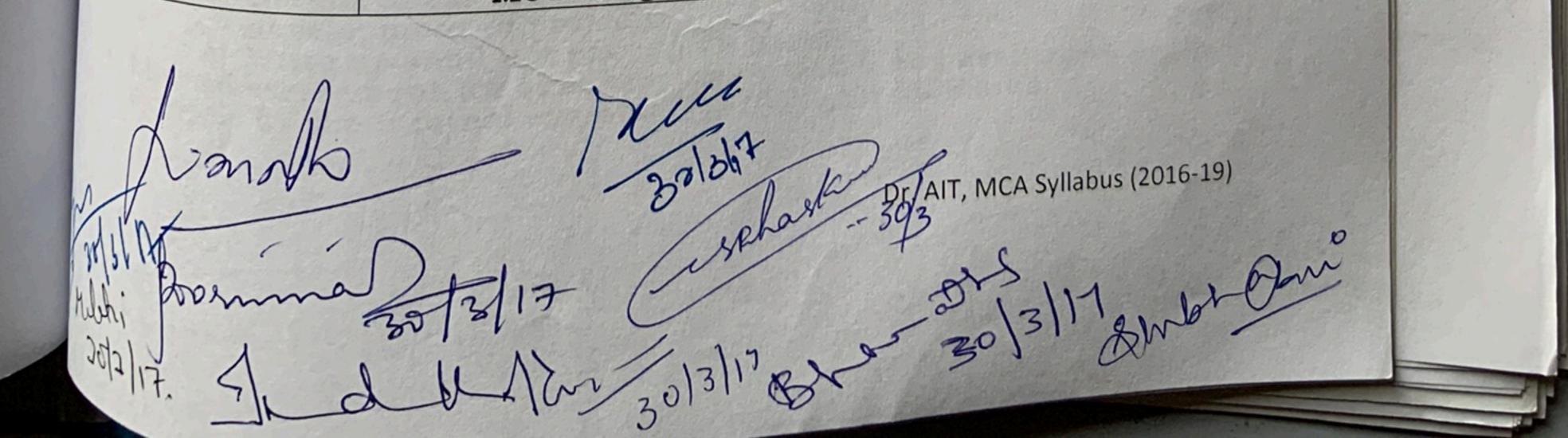
1		of the	(redits		IV Seme	ster			
subject	Name Sub	of the ject	Lecture	Tuto	The second second	Total	Exam Durati		arks	
code	Advance Program	ed Java ming	4	rial	cals	Credits		CIE	SEE	Total Marks
IICA41 IICA42		Testing	4		-	4	3	30	70	100
	Advance	d Web	4		-	4	3	30	70	100
IICA43		Elective-2			-	4	3	30	70	100
NCA44					-	4	3	30	70	
ICA45	Management Elective-3 Advanced Java Programming Lab		4			4	3	30	70	100
CAL46					2	2	3	50	50	100
CAL47	Software Lab	Software Testing Lab			1.5	1.5	3	50	50	100
CAL48	Web base Project-1	and the second state of th			1.5	1.5	3	50	50	100
		Total	20	-	5	25	24	300	500	800
	ELECT	IVE—2			MANAGE	MENT ELI	ECTIVE-3			
MCA		Data Ware & Mining	housing		ICA451	Man	ware Proj agement			
MCA		Artificial Intelligenc	e		ICA452	Man	ply Chain agement erprise			
MCA4		Software Architectu Machine L	Contraction of the second second second second		CA454	Enterprise Resource Planning E-commerce and Management Information System			n	

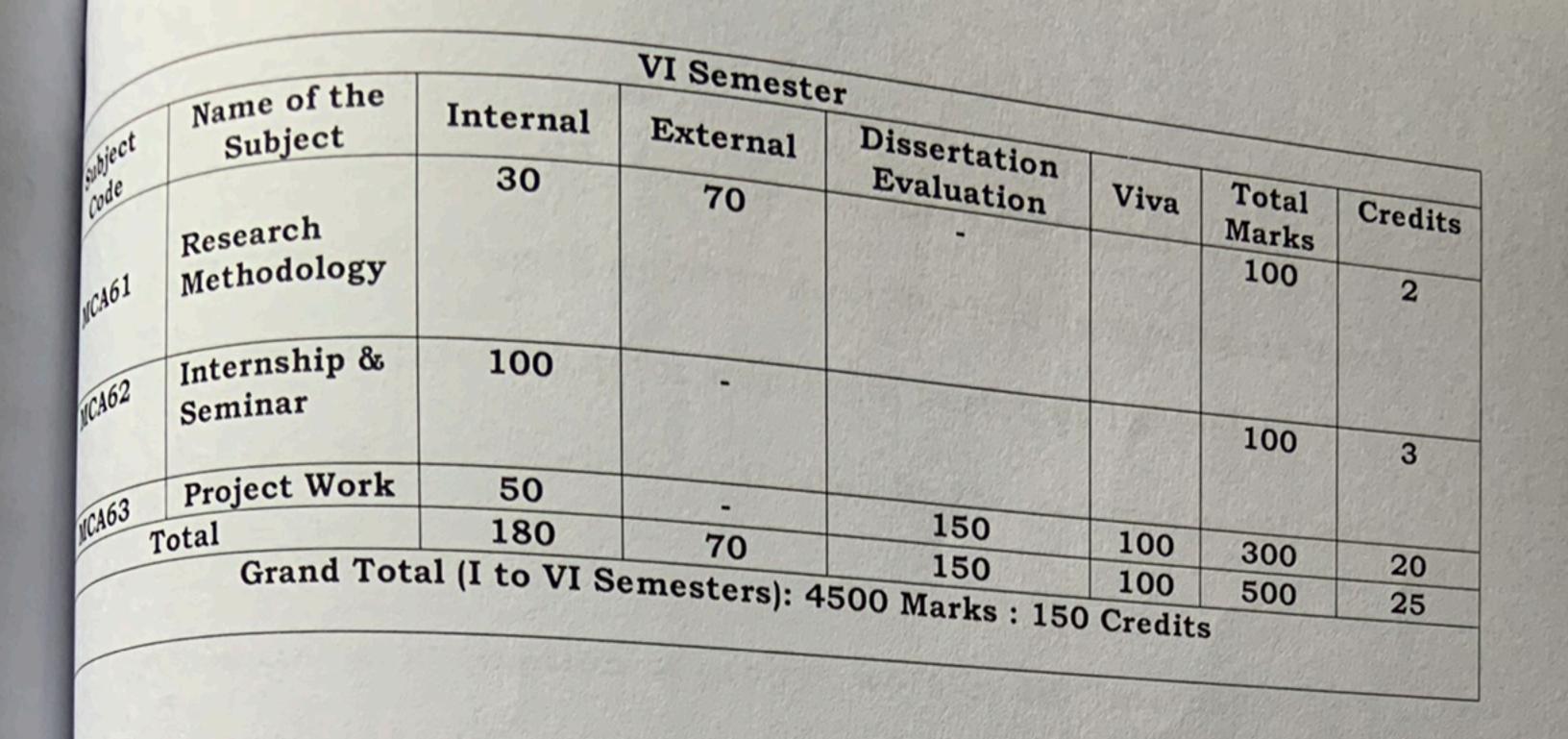
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Dr. AIT, MCA Syllabus (2016-19)



/				Credits		V Sem	ester		Contraction of	1.2.2.2
subject code			Tool	T	Practi	Total	Exam Durati	M	arks	
/	Object-Ori Modeling a Design Pat	ina	4		cals -	Credits	on in Hours	CIE	SEE	Total Mark
NCA51	Programm	ing Using				4	.3	30	70	100
ICA52	Mahile Ant		4		•	4	3	20	Contraction of the second	100
ICA53			4		-	4	3	30	70	100
CA54	Elective-4		4			4	And Andrewson	30	70	100
1155	Elective-5		4		-	4	3	30	70	100
CA55	Software D	esign					3	30	70	100
AL56	Laboratory	Laboratory .Net Laboratory			1.5	1.5	3	50	50	100
157					1.5	1.5	3	50	50	100
1158	Mini Project : (Mobile Applications Development using Android/iOS/Windo ws etc.,)		-		2.0	2.0	3	50	50	100
		Total	20	•	5	25	24	300	500	800
N	ICA541	ELECTIV	E-4 Id Comp	outing	M	CA551			Area	•
MCA542 Web Engineering				CA552	Mobi	le An	d Adho etworks	Contraction and the second second		
			vice Orie chitect		M	CA553	Line and		curity	
M	CA544		net of I	State and a state of the state		CA554		and the second	nalyti	and the second
MCA545 System			n Simul Nodellir	ation	^{&} M			vare Defined Ietworks		





uidelines:

MCA61: Research Methodology

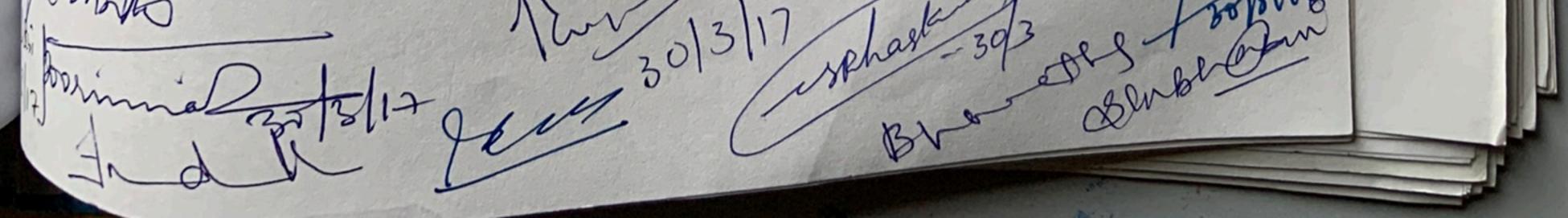
- Every week students have to attend two hrs class on research . methodology.
- Student should pass the subject at the end of the semester.

MCA62: Internship

- The students shall undergo internship for 6 weeks during the vacation immediately after the 5th semester examination.
- ' The internship shall be carried out in industry/R&D labs or institutions.
- Internship should be presented along with the report by the end of 6 weeks and shall be evaluated by the internal panel for 100 marks. Student should give a seminar on the internship topic.

MCA63: Project Work

Synopsis ' Synopsis of the project must be submitted before the end of the first ^{month} of 6th semester The synopsis of the project must include: a) Problem formulation and literature survey. b) Details of the required tools and technologies for the development of project. c) Write up shall not exceed 15 pages. c) Write up shall not exceed 15 pages. Internal assessment for synopsis presentation and evaluation of the synopsis by the internal examiner/guide is for 50 marks. Dr. AIT, MCA Syllabus (2016-19) // N N



Dissertation: The project shall be carried out in the same institution or in industry/R&D labs based on software tools and technologies learnt in MCA course/internship for minimum period of 16 weeks. , Internal assessment shall be evaluated by the internal panel/guide for 50 marks.

, For continuous evaluation of project work by the internal examiner/guide with progress reports is for 10 marks each. (3 progress reports x 10 marks= 30)

- . Final presentation for the entire project is evaluated for 20 marks.
- The internal examiners (Project Guide with at least 2 years of experience) and the external examiners shall be appointed by the

authorities of the college for the final evaluation of the project.

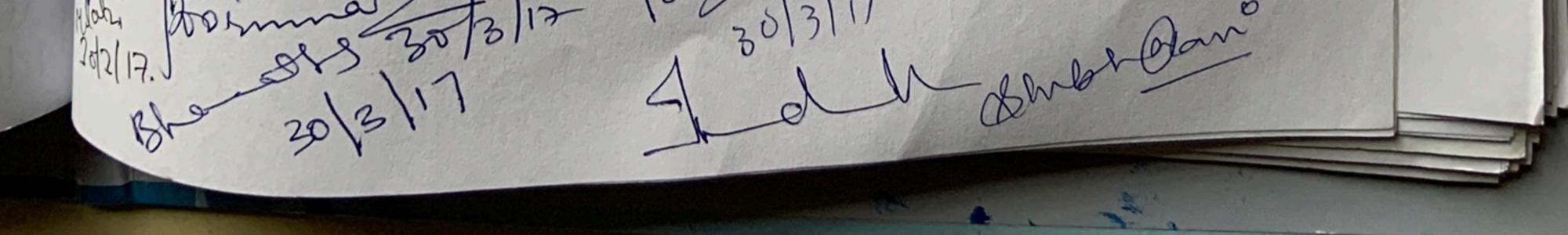
- Internal and external examiners shall carry out the evaluation of Dissertation report for 150 marks individually. The average of the marks allotted by the internal and external examiners shall be the final marks for the project Dissertation report evaluation.
- The project presentation and Viva-voce shall be evaluated jointly by both the internal and external examiners for 100 marks.
- The student should be encouraged to present/publish the

part/outcome of the project as an article in the

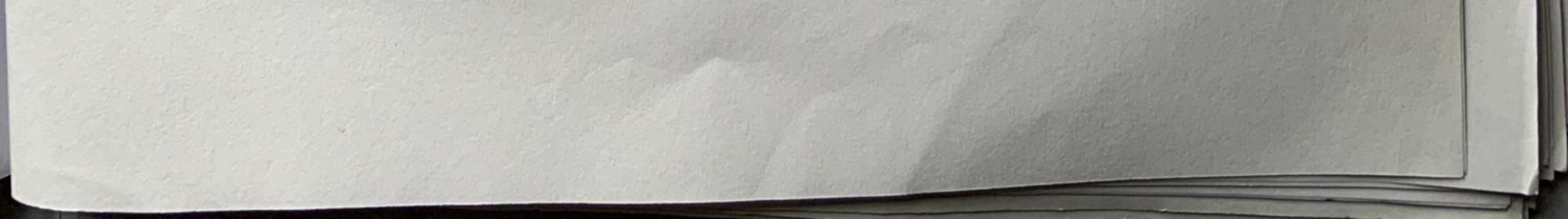
conferences/journals.

Dr. AIT, MCA Syllabus (2016-19)

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SI.	Category	Nomination of the Committee	Name of the Person	C:
<u>No</u>	Professor and Head of the Department	Chairperson	Dr. L.Manjunatha . Rao Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: manjuarjun2004@yahoo.com Mob: 9341214327	
2	Experts from outside college nominated by VTU	Member	Dr. K.S. Shreedhara Professor Dept of Computer Science and Engineering UBDT College, Davanagere Mob: 9448009306 Mailid: ks_shreedhara@yahoo.com	30.3.17 Jace
3	Internal Faculty members with various specializations	Member-1	Dr. Chandrakanth. G. Pujari Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: varuncp@rediffmail.com Mob: 9845380013	Envi M
		Member-2	Dr. Bharathi.S Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bharathishivu_s@yahoo.co.in Mob: 9902084476	13/3/17
		Member-3	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: indukarthik2009@yahoo.in Mob: 9739910995	1 d ll 30/3/17
4	Subject Experts from outside the college nominated by academic council	Member-1	Dr. Kavya. N. P Prof & Head Dept. of M.C.A RNSIT, Bangalore e-mail: npkavya@yahoo.com mob: 9945275345	122-3117.
		Member-2	Dr. Poornima Natarajæ Prof & Head Dept. of M.C.A DSCE, Bangalore e-mail: hod- mcavtu@dayanandasagar.edu mob: 9901644101	Joannal 30/3/12



BOARD OF STUDIES MEETING – MCA BOARD Signature of Participants

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si.	Category	Nomination of the Committee	Name of the Person	Signature
100	Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-1	Mr. Ravinandan Temminova Technologies Private Ltd. Mahalakshmi Layout Bengaluru-86 Email:ravinandan.me@gmail.com Mob:9902000779	Abbert
6	Representative from industry/Corporate sector/allied area relating to placement nominated by academic council	Member-2	Mr. Babu Rao Senior Engineering Project Manager Aricent Technologies Bengaluru E mail:babu.damera@aricent.com Mob:	Absent
7	Post graduate meritorious alumnus nominated by Principal	Member	Mr. Bhaskar • H • S Assistant Professor Maharanis Science College Palace Road, Bengaluru-1 Mob:9845382114	what
8	Special Invitees	Member-1	Ms. Shobha Rani. B.R Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: shobhakrishna8@gmail.com Mob: 9740098198	Den Davie
0		Member-2	Ms. Malathi. P Assistant Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: bfgcpm@rediffmail.com Mob: 7760880325	P. nolatri.

HOD HOD MASTER OF COMPUTER APPLICATIONS Dr. AMBEDIKAR INSTITUTE OF TECHNOLOGY BANGALORE-560 056



Ambedkar Institute of Technology, Bengaluru-56 Autonomous Institute, Affiliated to V T U, Belagavi) Nationally Accredited by NAAC with 'A' Grade

Master of Computer Applications Program Accredited by National Board of Accreditation



MCA I to VI semester Scheme (2016 – 2019)

Dr. Ambedkar Institute of Technology, Bengaluru – 560056 Master of Computer Applications

Institute - Vision and Mission VISION

To create Dynamic, Resourceful, Adept and Innovative Technical professionals to meet global challenges.

MISSION

- To offer state-of-the-art undergraduate, postgraduate and doctoral programmes in the fields of Engineering, Technology and Management.
- To generate new knowledge by engaging faculty and students in research, development and innovation leading to newer knowledge.
- To provide strong theoretical foundation to the students, supported by extensive practical training to meet industry requirements.
- To install moral and ethical values with social and professional commitment

DEPARTMENT - VISION AND MISSION

VISION

To create a quality human resource with good technical competence to face the global challenges.

MISSION

- To create a Center of Excellence through industry institute interaction.
- To prepare students for utilizing more creativity, innovativeness and leadership Qualities.
- To inculcate a sense of commitment to the students towards socio-economic development of the nation

Program Educational Objectives

- **PEO 1:** Graduates are prepared to be employed in IT industries and be engaged in learning, understanding, and applying new ideas.
- **PEO 2**: Graduates are prepared to be employed in academics and research environment.
- **PEO 3**: To provide an opportunity to students to learn the latest trends in computer technology and make them ready for life-long learning process with leadership skills and corporate social responsibilities.

Program Outcomes:

PO 1: Ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer based systems.

PO 2: Graduates will be able to demonstrate with excellent programming, analytical, logical and problem solving skills.

PO 3: Graduates will be able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability.

PO 4: An ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO 5: An ability to select modern computing tools and techniques and use them with dexterity.

PO 6: An ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude.

PO 7: An ability to appreciate the importance of goal setting and to recognize the need for life-long learning.

PO 8: Develop and maintain medium to large scale application software using theoretical and applied knowledge of software engineering and project management.

PO 9: An ability to communicate effectively.

PO 10: An ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development.

PO 11: An ability to execute the project either individually or in a group.

PO 12: An ability to become an Entrepreneur in the field of information technology to create a value and wealth for the betterment of the individual and society at large.

]	[Seme	ster			
		С	redits			Exam	Ma	rks	
Subject Code	Name of the Subject	Lecture	Tut oria 1	Pract icals	Total Credit s	Dura tion in Hour s	CIE	SEE	Total Marks
MCA11	Data structures using C	4		-	4	3	30	70	100
MCA12	Unix Programming	4		-	4	3	30	70	100
MCA13	Web Technologies	4		-	4	3	30	70	100
MCA14	Computer Organization	4		-	4	3	30	70	100
MCA15	Discrete Mathematical Structures	4		-	4	3	30	70	100
MCAL16	Data structures using C Lab			1.5	1.5	3	50	50	100
MCAL17	Unix Programming Lab			1.5	1.5	3	50	50	100
MCAL18	Web Programming Lab			2	2	3	50	50	100
·	Total	20	-	5	25	24	300	500	800

				I	I Seme	ester			
		C	redits			Exam	Ma	arks	
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
MCA21	Python Programming	4		-	4	3	30	70	100
MCA22	Object oriented programming using C++	4		-	4	3	30	70	100
MCA23	Database Management Systems	4		-	4	3	30	70	100
MCA24	Operating Systems	4		-	4	3	30	70	100
MCA25	Professional Communication & Ethics	4		-	4	3	30	70	100
MCAL26	Python Programming Lab			1.5	1.5	3	50	50	100
MCAL27	Object oriented programming using C++ lab			1.5	1.5	3	50	50	100
MCAL28	DBMS Lab			2	2	4	50	50	100
	Total	20	-	5	25	24	300	500	800

				II	I Sem	ester			
		C	redits			Exam	Ma	arks	
Subject Code	Name of the Subject	Lecture	Sem inar	Practi cals	Total Credit s	Durati on in Hours	CIE	SEE	Total Marks
MCA31	Computer Networks	4		-	4	3	30	70	100
MCA32	Java Programming	4		-	4	3	30	70	100
MCA33	Analysis and Design of Algorithms	4		-	4	3	30	70	100
MCA34	Software Engineering	4		-	4	3	30	70	100
MCA35	Elective -1	4		-	4	3	30	70	100
MCAL36	Computer Networks Lab			2	2	3	50	50	100
MCAL37	Java Programming Lab			1.5	1.5	3	50	50	100
MCAL38	Analysis and Design of Algorithms Lab			1.5	1.5	3	50	50	100
	Total	20	-	5	25	24	30 0	500	800

ELECTIVE-1					
MCA351	Intellectual Property Rights				
MCA352	Data Analysis using Spread Sheets				
MCA353	Operations Research				
MCA354	Principles of User Interface Design				

				I	/ Sem	ester			
		C	redits			Exam	Ma	arks	
Subject Code	Name of the Subject	Lecture	Tut orial	Practi cals	Total Credit s	Durati on in Hours	CIE	SEE	Total Marks
MCA41	Advanced Java Programming	4		-	4	3	30	70	100
MCA42	Software Testing and Practices	4		-	4	3	30	70	100
MCA43	Advanced Web Programming	4		-	4	3	30	70	100
MCA44	Elective-2	4		-	4	3	30	70	100
MCA45	Management Elective-3	4		-	4	3	30	70	100
MCAL46	Advanced Java Programming Lab			1.5	1.5	3	50	50	100
MCAL47	Software Testing Lab			1.5	1.5	3	50	50	100
MCAL48	Advanced Web Programming Lab			2	2	3	50	50	100
	Total	20	-	5	25	24	30 0	500	800

ELEC	CTIVE—2	MANAGEM	ENT ELECTIVE-3
MCA441	Data Warehousing & Mining	MCA451	Software Project Management
MCA442	Artificial Intelligence	MCA452	Supply Chain Management
MCA443	Software Architecture	MCA453	Enterprise Resource Planning
MCA444	Machine Learning	MCA454	E-commerce and Management Information System

					V Sem	ester	,		
			Credits	5		Exam	Ma	rks	
Subject Code	Name of the Subject	Lectu re	Tut oria 1	Practi cals	Total Credit s	Durat ion in Hours	CIE	SEE	Total Marks
MCA51	Object-Oriented Modeling and Design Patterns	4		-	4	3	30	70	100
MCA52	Programming Using C# & .NET	4		-	4	3	30	70	100
MCA53	Mobile Applications	4		-	4	3	30	70	100
MCA54	Elective-4	4		-	4	3	30	70	100
MCA55	Elective-5	4		-	4	3	30	70	100
MCAL56	Software Design Laboratory			1.5	1.5	3	50	50	100
MCAL57	.Net Laboratory			1.5	1.5	3	50	50	100
MCAL58	Mini Project : (Mobile Applications Development using Android/iOS/Wind ows etc.,)			2	2	3	50	50	100
	Total	20	-	5	25	24	300	500	800

	ELECTIVE-4		ELECTIVE-5				
MCA541	Cloud Computing	MCA551	Storage Area Networks				
MCA542	Web Engineering	MCA552	Mobile and Adhoc Networks				
MCA543	Service Oriented Architecture	MCA553	Cyber Security				
MCA544	Internet of things	MCA554	Big Data Analytics				
MCA545	System Simulation & Modelling	MCA555	Software Defined Networks				

VI Semester

Subject Code	Name of the Subject	Internal	External	Dissertation Evaluation	Viva	Total Marks	Credits
MCA61	Research Methodology	30	70	-		100	2
MCAI62	Internship & Seminar	25(I)	-	50 (I)	25(I)	100	3
MCAP63	Project Work	50(I)	-	75(I) +75 (E)	100(I+E)	300	20
	Total	105	70	150	125	500	25
	Grand To	otal (I to VI	Semesters):	4500 Marks : 1	50 Credits	_II	
: Internal	Examiner						
E : Externa	l Examiner						

Guidelines:

MCA61: Research Methodology

- Students have to attend two hours of theory class on every Saturday for 26 hours.
- Students should pass both CIE and SEE theory examinations
- Students should submit an assignment as a part of CIE evaluation.
- Students should give a seminar presentation which will be a part of CIE evaluation

MCAI62: Internship

- The students shall undergo an internship for 6 weeks during the vacation soon after the 5th semester SEE.
- The internship shall be carried out in industry/R&D labs or institution.
- The student should submit the internship report to the department

• The internship viva voce examination will be conducted by the internal examination panel for 25 marks.

MCAP63: Project Work

Synopsis

- Synopsis of the project must be submitted before the end of the first month of 6th semester
- The synopsis of the project must include:
 - a) Problem formulation and literature survey.
 - b) Details of the required tools and technologies for the development of project.
 - c) Write up shall not exceed 15 pages.
- Internal assessment for synopsis presentation and evaluation of the synopsis by the internal examiner/guide is for 50 marks.

Dissertation:

- The project shall be carried out in the same institution or in industry/R&D labs based on software tools and technologies learnt in MCA course/internship for minimum period of 16 weeks.
- Internal assessment shall be evaluated by the internal panel/guide for 50 marks.
- For continuous evaluation of project work by the internal examiner/guide with progress reports is for 50 marks and is evaluated at different phased of project work
- The internal examiners (Project Guide with at least 2 years of experience) and the external examiners shall be appointed by the authorities of the college for the final evaluation of the project.
- Internal and external examiners shall carry out the evaluation of Dissertation report for 75 marks individually.
- The project presentation and Viva-voce shall be evaluated jointly by both the internal and external examiners for 100 marks.
- The student should be encouraged to present/publish the part/outcome of the project as an article in the conferences/reputed journals.

Dr. Ambedkar Institute of Technology, Bengaluru-56

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(An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications Program (Accredited by National Board of Accreditation)



Aided By Govt. of Kamataka

2018-19 (Bos) MCA Syllabus



Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to V T U, Belagavi)

> Master of Computer Applications (MCA) Program (Accredited by National Board of Accreditation)

MINUTES OF BOARD OF STUDIES MEETING – MCA BOARD VENUE : MCA Department

19thJune 2018

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The Board of Studies meeting of MCA Program at Dr. Ambedkar Institute of Technology was held on 19th of June 2018 in the Department of M.C.A., Dr. AIT Campus, Bengaluru - 560056.

The following are the members of BoS meeting:

SI.			
No	Category	Nomination of the Committee	Name of the Person
1	Head of the Department	Chairperson	Dr. L.Manjunatha Rao Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 9341214327 manjuarjun2004@yahoo.com
2.	Experts from outside college nominated by VTU	Member	Dr. K.S. Shreedhara Professor Dept of Computer Science and Engineering UBDT College, Davanagere. 9448009306 ks_shreedhara@yahoo.com
3.	Internal Faculty members with various specializations	Member-1	Dr. Bharathi.S Professor (CAS) Dept. of M.C.A Dr. A.I.T,Bangalore-56 Mob: 9902084476 bharathishivu_s@yahoo.co.in

SI. No	Category	Nomination of the Committee	Name of the Person
	Internal Faculty	Member-2	Dr. Chandrakanth. G. Pujari Associate Professor Dept. of M.C.A Dr. A.I.T,Bangalore-56 9845380013 varuncp@rediffmail.com
	members with various specializations	Member-3	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 9739910995 indukarthik2009@yahoo.in
		Member-4	Dr. Dharani N V Assistant Professor, Dept. of M.C.A Dr. A.I.T,Bangalore-56 9739910995
4.	Subject Experts from	Member-1	dharanimanoj@gmail.com Dr. Hanumanthappa . M Professor & Chairman, Department of Computer Science & Applications, Bangalore University, Bangalore 56. Ph:9448819017, 080-22961451
	outside the college nominated by academic council	Member-2	Dr.Daya Sagar Professor Systems Science and Informatics Unit, Indian Statistical Institute- Bangalore Centre, Bengaluru 9880893291 bsdsagar@isibang.ac.in

SI. No	Category	Nomination of the Committee	Name of the Person
5.	Representative from	Member-1	Mr. Purushotham B
	industry/Corporate		Technical Training Head
	sector/allied area		Mahindra Comviva
	relating to placement		Bangalore
	nominated by		9980643711
(academic council		utham74@gmail.com
6.	Representative from industry/Corporate	Member-2	Mr. Chandrashekar Aithal Technical Lead,
	sector/allied area		J.P. Morgan Chase
	relating to placement		Bangalore
	nominated by	ALDER STREET	9008059555
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7.	Post graduate	Member	Mr. Pradeep
	meritorious alumnus		MDM Developer
	nominated by		Groove Software Pvt. Ltd
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8.		Member-1	Ms. Malathi. P
			Assistant Professor,
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			Dr. A.I.T,Bangalore-56
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	Special Invitees		bfgcpm@rediffmail.com
	1	Member-2	Ms. Shailaja L K
			Assistant Professor
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			Dr. AIT, Bengaluru- 56
			Mob: 9739006255
			shailaja_lk@yahoo.co.in

Minutes of BoS Meeting

The chairman welcomed all the member of BoS and introduced each one of them to the panel.

- The chairman shared that the MCA Department has been accredited by NBA. The **c** members of BoS congratulated the department for obtaining NBA accreditation. The **c** chairman explained the significance of NBA accreditation to the members.
- The members reviewed the vision and mission of the department. They have recommended the vision and mission as it is, which ismapping with the institution mission and vision.

The Board of Studies recommended the syllabus for MCA Programme for the academic year 2018-19 with the following suggestions through deliberations:

- Proposed the detailed syllabus for all 6 semesters of MCA program as per CBCS from the academic year 2018 - 2019by finalizing the core and elective subjects with respect to current industry and all stake holders' requirements(as per the guide lines of ACM, IEEE -Computer Society of India and NBA).
- 2. Proposed the detailed syllabus for V and VI semesters of MCA program of 2016-19 scheme as per CBCS for the academic year 2018 2019and proposed few suggestions.
- Proposed the detailed syllabus for all 4 semesters of MCA Direct Program (Two-year program) as per CBCS from the academic year 2018 - 2019by finalizing the core and elective subjects with respect to current industry and all stake holders' requirements(as per the guide lines of ACM, IEEE - Computer Society of India and NBA).
- 4. The BoS suggested to introduce the elective Cyber Security (MCA553) instead of Distributed Computing (MCA553).
- 5. The syllabus has been framed with equal weightage of credits to the three components: core academics, industry requirements, and research orientation.
- 6. Electives are offered in the light of new advancements in the field of information technology.
- 7. Proposed credit weightage for various components like lectures, tutorials, practicals, seminars, mini projects and Major project for each course.
- Credits for curriculum components in Master of Computer Applications programme are allotted (mathematics, management, humanities, professional core, electives, project work, and seminar) as per VTU guidelines.
- Proposed the Scheme of Teaching and Examination for all six/four semesters of MCA programme.
- 10. Proposed the Course Outcomes (COs) as per the Outcome Based Education of NBA.
- 11. The BoS has recommended the detailed syllabus, rules and regulations, scheme of teaching and examination for the fifth and sixth semesters of 2016-19 scheme.
 - I. Suggested the board to advice the students to deploy the projects in cloud with Azure or Microsoft cloud tools

- Professional Development and leadership skills should be imbibed by students II. through seminars for achieving lifelong learning skills.
- The members advised to include more lab sessions while handling mobile t III. applications
- IV. Mini project can be a mobile application deployed in cloud
- The members advised to make the students to publish the sixth semester projects in V. selected and reputed journals
- 12. The BoS has recommended the detailed syllabus, rules and regulations, scheme of teaching and examination for V and VI semesters of 2018-21 scheme

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- I. Suggested that mobile applications to be lab-based subject
- П. Introduce Devops as an elective. And also it was suggested to invite a resource person from industry to provide a talk on the industry expectations of Devops C
- III. The I semester subjects to be renamed as Linux Programming, OOPs using C++, Web Technologies, Discrete Mathematical Structures.
- Members suggested to include the concepts of Tuples, Strings, Databases in Python IV. Programming C
- V. NOSQL Database to replace with Advanced DBMS and include MongoDB
- To replace Software Engineering with Advanced Software Engineering and include VI. two modules of agile technology, SCRUM, RAD
- Web Engineering to include REST, SOAP, JSON VII.
- VIII. Networks lab to be based on virtualization or packet analyzer tools
- To include an elective for practicing aptitude and soft skills and to mentor students to IX. handle aptitude and soft skill techniques as seminars to improve recruitment process
- Advanced Web Programming to include PHP, JQuery and Angular X.
- Software Testing and Practice to have selenium with webdrivers, Cucumbers, Citrus XI. for BDD, TDD
- Service Oriented Architecture to be replaced by Devops XII.
- XIII. Introduce Machine Learning as an elective instead of Cloud Computing
- XIV. An elective on Cyberlaws and CyberSecurity to be included as per the advice of the GOI C
- XV. The BoS committee recommended for final approval of MCA syllabus

A) MCA V and VI Semesters of 2016-2019 scheme.

B) MCA I - IV semesters of 2018-2020 scheme of MCA Two-years Direct Program

C) MCA1-VI semesters of 2018-2021 scheme of MCA program

13. The Syllabus was finalized by incorporating all the suggestions

The BoS meeting was concluded with vote of thanks address by the chairman.

Chairman

Dr. Ambedkar Institute of Technology, Bengluru-56

(An Autonomous Institute, Approved by AICTE, Affiliated to V T U, Belagavi) Nationally Accredited by NAAC with 'A' Grade

Master of Computer Applications

(Accredited by National Board of Accreditation)



MCA I to VI Semester (2018-21) Scheme & Syllabus

As per BoS recommendations the scheme was finalized

Dr. Ambedkar Institute of Technology, Bengaluru – 560056 Master of Computer Applications

Institute - Vision and Mission

Vision

To create Dynamic, Resourceful, Adept and Innovative Technical professionals to meet global challenges.

Mission

- To offer state-of-the-art under graduate, post graduate and doctoral programs in the fields of Engineering, Technology and Management
- To generate new knowledge by engaging faculty and students in research, development and innovation.
- To provide strong theoretical foundation to the students, supported by extensive practical training to meet the industrial requirements.
- To instill moral and ethical values with social and professional commitment.

DEPARTMENT - VISION AND MISSION

VISION

To create a quality human resource with good technical competence to face the global challenges.

MISSION

- To create a Center of Excellence through industry institute interaction.
- To prepare students for utilizing more creativity, innovativeness and leadership Qualities.
- To inculcate a sense of commitment to the students towards socio-economic development of the nation

Program Educational Objectives

PEO 1: Graduates are prepared to be employed in IT industries and be engaged in learning, understanding, and applying new ideas.

PEO 2: To prepare students for utilizing more creativity, innovativeness and leadership Qualities.

PEO 3: To provide an opportunity to students to learn the latest trends in computer technology and make them ready for life-long learning process with leadership skills and corporate social responsibilities.

Program Outcomes:

PO 1: Ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modelling and design of computer based systems.

PO 2: Graduates will be able to demonstrate with excellent programming, analytical, logical and problem solving skills.

PO 3: Graduates will be able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability.

PO 4: An ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO 5: An ability to select modern computing tools and techniques and use them with dexterity.

PO 6: An ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude.

PO 7: An ability to appreciate the importance of goal setting and to recognize the need for life-long learning.

PO 8: Develop and maintain medium to large scale application software using theoretical and applied knowledge of software engineering and project management.

PO 9: An ability to communicate effectively.

PO 10: An ability to understand the impact of system solutions in a contemporary, global, economic, environmental, and societal context for sustainable development.

PO 11: An ability to execute the project either individually or in a group.

PO 12: An ability to become an Entrepreneur in the field of information technology to create a value and wealth for the betterment of the individual and society at large.

		I Semester								
		C	redits			Exam	Ma	rks		
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks	
18MCA11	OOPS using C++	4	-	-	4	3	50	50	100	
18MCA12	Linux Programming	4	-	-	4	3	50	50	100	
18MCA13	Web Technologies	4	-	-	4	3	50	50	100	
18MCA14	Discrete Mathematical Structures	4	-	-	4	3	50	50	100	
18MCA15	Computer Organization and Architecture	3	-	-	3	3	50	50	100	
18MCAL16	OOPS Lab		-	1	1	3	50	50	100	
18MCAL17	Linux Lab		-	1	1	3	50	50	100	
18MCAL18	Web Technology Lab		-	1	1	3	50	50	100	
	Total	19	-	3	22	24	400	400	800	

					II Seme	ster			
		C	redits			Exam	Ma	rks	
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA21	Java Programming	4	-	-	4	3	50	50	100
18MCA22	Data Structures using C++	4	-	-	4	3	50	50	100
18MCA23	Analysis and Design of Algorithms	4	-	_	4	3	50	50	100
18MCA24	Database Management System	4	-	-	4	3	50	50	100
18MCA25	Operating System	3	-	_	3	3	50	50	100
18MCAL26	Java Programming Lab		-	1	1	3	50	50	100
18MCAL27	Data Structures Lab		-	1	1	3	50	50	100
18MCAL28	DBMS lab		-	1	1	3	50	50	100
	Total	19	-	3	22	24	400	400	800

		III Semester								
		C	redits			Exam	Marks			
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks	
18MCA31	Network Architecture & Management	4	-	-	4	3	50	50	100	
18MCA32	Python Programming	4	-	-	4	3	50	50	100	
18MCA33	Advanced Software Engineering	4	-	-	4	3	50	50	100	
18MCA34	Data Science using R	3	-	-	3	3	50	50	100	
18MCA35	Elective-1	3	-	-	3	3	50	50	100	
18MCAL36	Network Architecture Lab		-	1	1	3	50	50	100	
18MCAL37	Python programming Lab		-	1	1	3	50	50	100	
18MCAL38	Data Science using R Lab		-	1	1	3	50	50	100	
	Total	18	-	3	21	24	400	400	800	

ELECTIVE-1									
Subject	Name of the Subject	Cred	its			Exam	Mark	s	Total
Code		L	T	P	Credits	Durati	CIE	SEE	Marks
						on			
18MCA351	Software Testing and	3	-	-	3	3	50	50	100
	Practices								
18MCA352	Advanced DBMS	3	-	-	3	3	50	50	100
18MCA353	Artificial Intelligence	3	-	-	3	3	50	50	100

		IV Semester								
		C	redits			Exam	Ма	rks		
Subject Code	Name of the Subject	Lecture	Tuto rial	practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks	
18MCA41	Enterprise Applications-1	3	-	-	3	3	50	50	100	
18MCA42	Advanced Web Technologies	3	-	-	3	3	50	50	100	
18MCA43	Analytical Skills And Building Professional Development	2	1	-	3	3	50	50	100	
18MCA44	Elective-2	3	-	-	3	3	50	50	100	
18MCA45	Elective-3	3	-	-	3	3	50	50	100	
18MCA46	Research Methodology	2	-		2	3	50	50	100	
18MCAL47	Enterprise Applications Lab		-	1	1	3	50	50	100	
18MCAL48	Advanced Web Technologies Lab		-	1	1	3	50	50	100	
18MCAM49	Mini Project using Android		1	1	2	3	50	50	100	
	Total	16	2	3	21	27	450	450	900	

	ELECTIVE-2								
Subject	Name of the Subject	Cred	its			Exam	Marks		Total
Code		L	Т	Ρ	Credits	Duratio	CIE	SEE	Marks
						n			
18MCA441	Information Security	3	-		3	3	50	50	100
18MCA442	Data Mining &	3	-		3	3	50	50	100
	Business Intelligence								
18MCA443	Object oriented	3	-		3	3	50	50	100
	Modelling & Design								

ELECTIVE-3									
Subject	Subject Name of the Subject Credits						Marks		Total
Code		L	Т	Ρ	Credits	Durati	CIE	SEE	Marks
						on			
18MCA451	Software Quality &	3	-		3	3	50	50	100
	Performance Evaluation								
18MCA452	Software Architecture	3	-		3	3	50	50	100
18MCA453	Enterprise Resource	3	-		3	3	50	50	100
	Planning								

					V Seme	ster			
		C	redits			Exam	Ма	rks	
Subject Code	Name of the Subject	Lecture	Tuto rial	practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA51	Machine Learning	4	-	-	4	3	50	50	100
18MCA52	Big Data Analytics	3	-	-	3	3	50	50	100
18MCA53	Cloud Computing	3	-	-	3	3	50	50	100
18MCA54	Elective -4	3	-	-	3	3	50	50	100
18MCA55	Elective -5	3	-	-	3	3	50	50	100
18MCAL56	Machine Learning Lab		_	1	1	3	50	50	100
18MCAL57	Big Data Analytics Lab		_	1	1	3	50	50	100
18MCAL58	Cloud Computing Lab		_	1	1	3	50	50	100
18MCAI59	Industry Internship (6 weeks)				5	3	50	50	100
	Total	16	-	3	24	27	450	450	900

	ELECTIVE-4								
Subject	Name of the Subject	V SE	_	ER		Exam	Mark	s	Total
Code	j	L	T	Р	Credi ts	Durati on	CIE	SEE	Marks
18MCA541	Enterprise Application-2	3	-		3	3	50	50	100
18MCA542	Full Stack Development with MERN	3	-		3	3	50	50	100
18MCA543	DevOps	3	-		3	3	50	50	100

ELECTIVE-5									
V SEMESTER									
Subject	Name of the Subject	Cred	its			Exam	Mark	S	Total
Code		L	Т	Ρ	Credi	Durati	CIE	SEE	Marks
					ts	on			
18MCA551	Web Services	3	-		3	3	50	50	100
18MCA552	Internet of Things	3	-		3	3	50	50	100
18MCA553	Block Chain Technology	3	-		3	3	50	50	100

	VI SEMESTER								
Subject Code	Name of the Subject	Internal	External	Dissertation Evaluation	Viva voc e	Total Marks	Credit s		
18MCAS61	Technical Seminar	50				50	2		
18MCAP62	Project Work	50	-	100	100	250	20		
To	tal	100		100	100	300	22		

Grand Total (I to VI Semesters): 4500 Marks : 132 Credits

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Master of Computer Applications

(Accredited by National Board of Accreditation)



Aided By Govt: of Kamataka

2019 (BOS

- 1. BOS Proceedings
- 2. 2018-21 Scheme
- Syllabus of III and IV semesters(2018-21) scheme
- 4. Modified syllabus of V semester (2016-19) scheme

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Dr. L. MANJUNATHA RAO Professor & Head MCA Programe Dr. Ambedkar Institute of Technilogy Bangalore - 560 056.



Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to V T U, Belagavi) Master of Computer Applications (MCA)

MINUTES OF BOARD OF STUDIES MEETING – MCA BOARD VENUE : MCA Department

31st May 2019.

The Board of Studies meeting of MCA Program at Dr. Ambedkar Institute of Technology was held on 31st of May 2019 at 10.30 a.m.in the Department of M.C.A., Dr. AIT Campus, Bengaluru – 560 056.

AGENDA:

- Finalization of Syllabus Scheme 2018 21 of MCA Programme (Review of Vision, Mission, and Program Educational Objectives)
- 2. Review of MCA III and IV semester syllabus for the academic year 2019-20
- 3. Review of MCA V and VI semester scheme
- 4. Any other curriculum related matter

The following are the members of Board of Studies

SI. No	Nomination of the Committee	Name of the Person
	Chairman	Dr. L. Manjunatha . Rao
1	HOD .	Prof. & Head, Dept. of M.C.A Dr. A.I.T,Bangalore-56 e-mail: manjuarjun2004@yahoo.com Mob: 9341214327
2.	VTU Nominee	Dr. N P Kavya.
	1 - and the second	Professor, MCA Program
-	1 h have been a server	RNSIT, Bengaluru
		Mailid: npkavya@gmail.com
	The second second	Mob: 9945275345
3.	Imdustry / R & D	Prof. M R Muralidharan
	representatives	Principal Research Scientist
· j' ·		IISc, Bengaluru
		murali@iisc.ac.in
		Ph: 22932895
4		Dr. Hanumanthappa . M
100	and and a second	Professor & Chairman,
	Service and the service of the servi	Department of Computer Science & Applications, Bangalore
		University, Bangalore 56.

HA RAO Professor & Head Dr. MCA Programe War Institute of Technilogy

	External Subject Experts	
		Ph 9448819017, 080-22961451
1.67.53		Dr. Daya Sagar
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5	Industry Representative	Mr. Mekala V Reddy
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6	Member	Mrs. Shwetha Basavaraj
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		Shwetha basavaraj@infosys.com
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		Associate Professor Dept. of M.C.A
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		Dr. Indumathi. S. K
	Internal Faculty Members	Associate Professor, Dept. of M.C.A
	with Various specializations	Dr. A.I.T,Bangalore-56
		e-mail: indukarthik2009@yahoo.in
7		Mob: 9739910995
		Ms. Shobha Rani, B.R
		Associate Professor, Dept. of M.C.A
		Dr. A.I.T,Bangalore-56
		e-mail: shobhakrishna8@gmail.com
		Mob: 9740098198
1 TAN		Ms. Anitha J
	•	Assistant Professor, Dept of M.C.A.
		Dr. AIT, Bangalore - 56
		Email: alochan@rediffmail.com
	the second	

MANJUNATHA RAO Professor & Head MCA Programe Dr.

The Board of Studies has recommended the syllabus of MCA Programme (2018-21 Scheme) for the academic year 2019-20. The following suggestions were made

3

- Proposed the scheme and the detailed syllabus of all semiesters of MCA programme (2018-21 scheme) as per Outcome Based Education in accordance with professional societies like ACM, IEEE - Computer Society of India and NBA graduate attributes.
- The syllabus has been framed with equal weightage of credits to all the components (core academics, industry requirement, research orientation, lifelong learning and societal consciousness)
- Electives were offered in the light of new advancements in the field of information technology.
- Proposed credit weightage for lectures, tatorials, lab sessions, seminars, mini project, internship and major project for each course.
- 5. The Syllabus is designed with proportionate credits as per NBA program outcomes of MCA programme by including mathematics, management, humanities, professional core, electives, project work, seminar, internship, lifelong learning and societal consciousness as per VTU guidelines.
- Proposed the Scheme of Teaching and Examination for all six semesters of MCA programme.
- 7. Defined the Course Outcomes (COs) as per the Outcome Based Education of NBA.
- The BoS has recommended the detailed syllabus, rules and regulations, scheme of teaching and examination for all the six semesters.
- 9 Proposed the complete scheme with course title, course code, credit distribution details, examination hours, marks allotted etc. The BoS members recommended the proposed scheme with few suggestions, accordingly the scheme was updated.
- 10. The BoS members proposed the following recommendations

Members suggested to have 1.5 credits to each lab that is 18MCAL58 (Cloud Computing Lab) and 18MCAL57 (Big Data Analytics Lab)

- 11. The BOS members advised to carry out the internship of 2016-19 scheme to be completed before the commencement of V semester soon after the examinations of IV semester for the students of V semester for the academic year 2019-20. Internship has to be evaluated in MCA V semester by the respective guides and the marks has to be entered along with the sixth semester marks as per the MCA 6th semester 2016-19 scheme. (To provide the entire 6th semester to carry out major project)
- The BoS has recommended MCA III and IV semester detailed syllabus of 2018-21 scheme and MCA V and VI semester syllabus of 2016-19 scheme.

UNATHA RAO Professor & Head Dr. Ambedkar Institute of Technilogy MCA Programe malore - 560 056.

- 13. The Syllabus was finalized by incorporating all the suggestions made by the honorable members.
 - Dr. Kavya of VTU nominee has suggested to include NOSQL in ADBMS course and accordingly incorporated.
 - 15. The members suggested to include Research Methodology in IV semester and allow the students to carry out the project as a full-time intern.
 - 16. The following are the recommendations in III and IV semester syllabus from the academic year 2019-20

III Semester

Proposed Sc	heme	Recommended Scheme		Remarks
Subj. Code	Subj. Name	Subj. Code	Subj. Name	Constant and the
18MCA31	Network Architecture And Management	18MCA31	Network Architecture & Management	No Change
18MCA32	Python Programming	18MCA32	Python Programming	No Change
18MCA34	Advanced Software Engineering	18MCA33	Advanced Software Engineering	No Change
18MCA33	Object Oriented Modelling and Design	18MCA34	Data Science using R	Recommended
18MCA35	Elective - 1	18MCA35	Elective - I	AND THE PROPERTY
18MCAL36	Computer Networks Lab	18MĊAL36	Network Architecture Lab	No Change
18MCAL37	Python Programming Lab	18MCAL37	Python Lab	No Change
18MCAL38	OOMD Lab	18MCAL38	Data Science using R Lab	Recommended
Elective - I	•			
18MCA351	NOSQL	18MCA351	Software Testing and Practices	Recommended
18MCA352	Aptitude Skill based learning	18MCA352	Advanced DBMS	Recommended
18MCA353	Operations Research	18MCA353	Artificial Intelligence	Recommended

Dr. L. MANUMATHA RAO

Dr. L. MANJONAT Professor & Head MCA Programe Dr. Ambedkar Institute of Technilogy Bangalore - 560 056.

IV Semester

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Proposed Scl		Recommended	Scheme.	Remarks
Subj. Code	Subj. Name	Subj. Code	Subj. Name	
18MCA41	Advanced Java Programming	18MCA41	Enterprise Applications -	No Change
18MCA42	Advanced Web Technologies	18MCA42	Advanced Web Technologies	No Chang q
18MCA43	Software Testing and Practices	18MCA43	Analytical Skills and Building Professional Development	Recommended
18MCA44	Elective - 2	18MCA44	Elective - 2	
18MCA45	Management Elective - 3	18MCA45	Elective - 3	
		18MCA46	Research Methodology	Recommended
18MCAL46	Advanced Java Programming Lab			
18MCAL47	Software Testing Lab	18MCAL47	Enterprise Applications Lab	Recommended
18MCAL48	Mini project using Web Technologies Lab	18MCAL48	Advanced Web Technologies Lab	Recommended
4.		18MCA49	Mini project using Android	Recommended
Elective - 2				
18MCA441	Data science using R	18MCA441	Information Security	Recommended
18MCA442	Artificial Intelligence	18MCA442	Advanced DBMS	Recommended
18MCA443	Software Architecture	18MCA443	Object Oriented and Design	Recommended
18MCA444	Soft Computing	-	-	•••
Elective - 3				
Proposed Se	cheme	Recommende	and in succession of the succe	Remarks
18MCA451	Software Project Management	18MCA441	Software Quality & Performance Evaluation	Recommended
18MCA452	Professional Development and Leadership	18MCA452	Software Architecture	Recommended
18MCA453		18MCA453	Enterprise Resource Planning	No Change

Comp Dr. L. MANJUNATHA RAO Professor & Head MCA Programe Dr. Ambedkar Institute of Technilogy

SI. No	Nomination of the Committee	Name of the Person		
	Chairman	Dr. L. Manjunatha . Rao		
	HOD .	Prof. & Head, Dept. of M.C.A		
1		Dr. A.I.T,Bangalore-56		
		e-mail: manjuarjun2004@yahoo.com		
	A CARLEN AND A CARLEND	Mob: 9341214327		
2.	VTU Nominee	Dr. N P Kavya.		
		Professor, MCA Program		
		RNSIT, Bengaluru		
		Mailid: <u>npkavya@gmail.com</u>		
	· · ·	Mob: 9945275345		
3.	Imdustry / R & D representatives	ProfM R Muralidharan		
		Principal Research Scientist		
		IISc, Bengaluru		
		murali@iisc.ac.in		
		Ph: 22932895		
4		Dr. Daya Sagar		
		Professor Systems Science and Informatics		
		Unit		
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6	Member			
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		Senior Project Manager,		
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Chairman = BOS

MCA Program

Dr. Ambedkar Institute of Technology

Dr. L. MANJUNATHA RAO Professor & Head MCA Programe Dr. Ambedkar Institute of Technilogy Bangalore - 560 056.



Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to V T U. Belagavi) Master of Computer Applications (MCA)

VENUE : MCA Department

31st May, 2019.

The Board of Studies meeting of MCA Program at Dr. Ambedkar Institute of Technology to be held on 31st of March 2019 at 10.30 a.m. in the Department of M.C.A., Dr. AIT Campus, Bengaluru - 560056.

AGENDA:

1. MCA Program Syllabus 2018-21 scheme

(Review of Vision, Mission, and Program Educational Objectives)

- 2. Review of MCA III and IV semester syllabus for the academic year 2019-20
- 3. Review of MCA V and VI semester scheme
- 4. Review of internship for 2016-19 scheme
- 5. Any other curriculum related matter

The following are the members of BoS meeting

SI. No	Nomination of the Committee	Name of the Person	Signature
	Chairman	Dr. L. Manjunatha Rao	
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4		Dr. Hanumanthappa .M	
		Professor & Chairman,	DN/ L
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6- Dr.

Dr. L. MANJUNATHA RAO Professor & Head MCA Programe

No	Nomination of the Committee	Name of the Person	
5	Industry ;	Mr Mekala V Reddy	Signature
	Representative		
		Business Operations Leader	menteldy
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		Mekala reddy gin ibm com	
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Chairman-13015

MCA Program 3/1/5/1

Dr. Ambedkar Institute of Technology, Bengaluru – 560 056 Master of Computer Applications

BOARD OF STUDIES MEETING - MCA BOARD

Signature of Participants

SL.	Nomination of the		
No	Committee	Name of the Person	Signature
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e-mail: alochan@rediffmail.com				Assistant Professor, Dept. of M.C.A.	
				Dr. AIT, Bangalore - 56	a en mo
Ar L operations				e-mail: alochan@rediffmail.com	Que J31/5101
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Dr. L. MANJUNATHA RAO Professor & Head MCA Programe Dr. Ambedkar Institute of Technilogy Bangakore - 560 056.

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Hend Mich Program 31/5/2019

Dr. Ambedkar Institute of Technology, Bengluru-56

(An Autonomous Institute, Approved by AICTE, Affiliated to V T U, Belagavi) Nationally Accredited by NAAC with 'A' Grade

Master of Computer Applications

(Accredited by National Board of Accreditation)



MCA I to VI Semester (2018-21) Scheme & Syllabus

As per BoS recommendations the scheme was finalized

(31st of May 2019)

Dr. Ambedkar Institute of Technology, Bengaluru – 560056 Master of Computer Applications

Institute - Vision and Mission

Vision

To create Dynamic, Resourceful, Adept and Innovative Technical professionals to meet global challenges.

Mission

- To offer state-of-the-art under graduate, post graduate and doctoral programs in the fields of Engineering, Technology and Management
- To generate new knowledge by engaging faculty and students in research, development and innovation.
- To provide strong theoretical foundation to the students, supported by extensive practical training to meet the industrial requirements.
- To instill moral and ethical values with social and professional commitment.

DEPARTMENT - VISION AND MISSION

VISION

To create a quality human resource with good technical competence to face the global challenges.

MISSION

- To create a Center of Excellence through industry institute interaction.
- To prepare students for utilizing more creativity, innovativeness and leadership Qualities.
- To inculcate a sense of commitment to the students towards socio-economic development of the nation

Program Educational Objectives

PEO 1: Graduates are prepared to be employed in IT industries and be engaged in learning, understanding, and applying new ideas.

PEO 2: To prepare students for utilizing more creativity, innovativeness and leadership Qualities.

PEO 3: To provide an opportunity to students to learn the latest trends in computer technology and make them ready for life-long learning process with leadership skills and corporate social responsibilities.

Program Outcomes:

PO 1: Ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modelling and design of computer based systems.

PO 2: Graduates will be able to demonstrate with excellent programming, analytical, logical and problem solving skills.

PO 3: Graduates will be able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability.

PO 4: An ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO 5: An ability to select modern computing tools and techniques and use them with dexterity.

PO 6: An ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude.

PO 7: An ability to appreciate the importance of goal setting and to recognize the need for life-long learning.

PO 8: Develop and maintain medium to large scale application software using theoretical and applied knowledge of software engineering and project management.

PO 9: An ability to communicate effectively.

PO 10: An ability to understand the impact of system solutions in a contemporary, global, economic, environmental, and societal context for sustainable development.

PO 11: An ability to execute the project either individually or in a group.

PO 12: An ability to become an Entrepreneur in the field of information technology to create a value and wealth for the betterment of the individual and society at large.

					I Seme	ster			
		C	redits			Exam	Marks		
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA11	OOPS using C++	4	-	-	4	3	50	50	100
18MCA12	Linux Programming	4	-	-	4	3	50	50	100
18MCA13	Web Technologies	4	-	-	4	3	50	50	100
18MCA14	Discrete Mathematical Structures	4	-	-	4	3	50	50	100
18MCA15	Computer Organization and Architecture	3	-	-	3	3	50	50	100
18MCAL16	OOPS Lab		-	1	1	3	50	50	100
18MCAL17	Linux Lab		-	1	1	3	50	50	100
18MCAL18	Web Technology Lab		-	1	1	3	50	50	100
	Total	19	-	3	22	24	400	400	800

					II Seme	ster			
		C	redits			Exam	Ma	rks	
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA21	Java Programming	4	-	-	4	3	50	50	100
18MCA22	Data Structures using C++	4	-	-	4	3	50	50	100
18MCA23	Analysis and Design of Algorithms	4	-	_	4	3	50	50	100
18MCA24	Database Management System	4	-	-	4	3	50	50	100
18MCA25	Operating System	3	-	_	3	3	50	50	100
18MCAL26	Java Programming Lab		-	1	1	3	50	50	100
18MCAL27	Data Structures Lab		-	1	1	3	50	50	100
18MCAL28	DBMS lab		-	1	1	3	50	50	100
	Total	19	-	3	22	24	400	400	800

					III Seme	ester			
		C	redits			Exam	Ма	rks	
Subject Code	Name of the Subject	Lecture	Tuto rial	Practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA31	Network Architecture & Management	4	-	-	4	3	50	50	100
18MCA32	Python Programming	4	-	-	4	3	50	50	100
18MCA33	Advanced Software Engineering	4	_	-	4	3	50	50	100
18MCA34	Data Science using R	3	-	-	3	3	50	50	100
18MCA35	Elective-1	3	-	-	3	3	50	50	100
18MCAL36	Network Architecture Lab		-	1	1	3	50	50	100
18MCAL37	Python programming Lab		-	1	1	3	50	50	100
18MCAL38	Data Science using R Lab		-	1	1	3	50	50	100
	Total	18	-	3	21	24	400	400	800

	ELECTIVE-1												
Subject	Name of the Subject	Cred	its			Exam	Mark	s	Total				
Code		L	T	P	Credits	Durati	CIE	SEE	Marks				
						on							
18MCA351	Software Testing and	3	-	-	3	3	50	50	100				
	Practices												
18MCA352	Advanced DBMS	3	-	-	3	3	50	50	100				
18MCA353	Artificial Intelligence	3	-	-	3	3	50	50	100				

					IV Seme	ester			
		C	redits		Exam	Ма	rks		
Subject Code	Name of the Subject	Lecture	Tuto rial	practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA41	Enterprise Applications-1	3	-	-	3	3	50	50	100
18MCA42	Advanced Web Technologies	3	-	-	3	3	50	50	100
18MCA43	Analytical Skills And Building Professional Development	2	1	-	3	3	50	50	100
18MCA44	Elective-2	3	-	-	3	3	50	50	100
18MCA45	Elective-3	3	-	-	3	3	50	50	100
18MCA46	Research Methodology	2	-		2	3	50	50	100
18MCAL47	Enterprise Applications Lab		-	1	1	3	50	50	100
18MCAL48	Advanced Web Technologies Lab		-	1	1	3	50	50	100
18MCAM49	Mini Project using Android		1	1	2	3	50	50	100
	Total	16	2	3	21	27	450	450	900

	ELECTIVE-2												
Subject	Exam	Mark	s	Total									
Code		L	L T P Credits			Duratio	CIE	SEE	Marks				
						n							
18MCA441	Information Security	3	-		3	3	50	50	100				
18MCA442	Data Mining &	3	-		3	3	50	50	100				
	Business Intelligence												
18MCA443	Object oriented	3	-		3	3	50	50	100				
	Modelling & Design												

	ELECTIVE-3												
Subject Name of the Subject Credits Exam Marks													
Code		L	Т	Ρ	Credits	Durati	CIE	SEE	Marks				
						on							
18MCA451	Software Quality &	3	-		3	3	50	50	100				
	Performance Evaluation												
18MCA452	Software Architecture	3	-		3	3	50	50	100				
18MCA453	Enterprise Resource	3	-		3	3	50	50	100				
	Planning												

					V Seme	ster			
		C	redits			Exam	Ма	rks	
Subject Code	Name of the Subject	Lecture	Tuto rial	practi cals	Total Credits	Durati on in Hours	CIE	SEE	Total Marks
18MCA51	Machine Learning	4	-	-	4	3	50	50	100
18MCA52	Big Data Analytics	3	-	-	3	3	50	50	100
18MCA53	Cloud Computing	3	-	-	3	3	50	50	100
18MCA54	Elective -4	3	-	-	3	3	50	50	100
18MCA55	Elective -5	3	-	-	3	3	50	50	100
18MCAL56	Machine Learning Lab		_	1	1	3	50	50	100
18MCAL57	Big Data Analytics Lab		_	1	1	3	50	50	100
18MCAL58	Cloud Computing Lab		_	1	1	3	50	50	100
18MCAI59	Industry Internship (6 weeks)				5	3	50	50	100
	Total	16	-	3	24	27	450	450	900

	ELECTIVE-4										
V SEMESTER											
Subject	Name of the Subject	Subject Credits Exam							Total		
Code		L	T	Ρ	Credi	Durati	CIE	SEE	Marks		
					ts	on					
18MCA541	Enterprise Application-2	3	-		3	3	50	50	100		
18MCA542	Full Stack Development	3	-		3	3	50	50	100		
	with MERN										
18MCA543	DevOps	3	-		3	3	50	50	100		

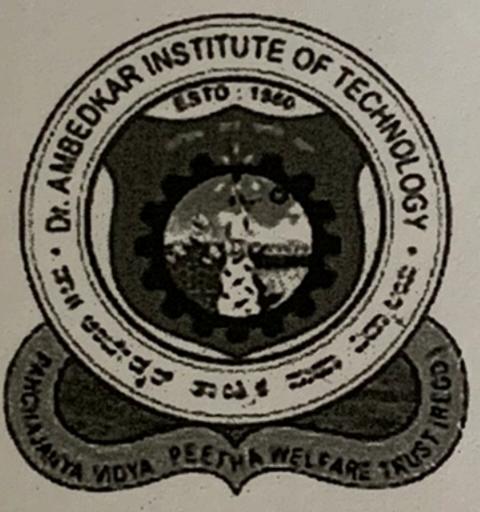
ELECTIVE-5 V SEMESTER										
Code		L	Т	Ρ	Credi	Durati	CIE	SEE	Marks	
					ts	on				
18MCA551	Web Services	3	-		3	3	50	50	100	
18MCA552	Internet of Things	3	-		3	3	50	50	100	
18MCA553	Block Chain Technology	3	-		3	3	50	50	100	

	VI SEMESTER											
Subject Code	Name of the Subject	Internal	External	Dissertation Evaluation	Viva voc e	Total Marks	Credit s					
18MCAS61	Technical Seminar	50				50	2					
18MCAP62	Project Work	50	-	100	100	250	20					
Total		100		100	100	300	22					

Grand Total (I to VI Semesters): 4500 Marks : 132 Credits

Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications Program (Accredited by National Board of Accreditation)



Aided By Govt. of Karnataka

BOS-2020

Board of Studies

held on 13th, August 2020

1. MCA BoS Meeting Proceedings

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- 2. Scheme And Syllabus of MCA 2 years (100 Credits)
- 3. Scheme And Syllabus of MCA V and VI semester (2018-21 Scheme)
- 4. Scheme and Syllabus of Inter department Electives

Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications Program (Accredited by National Board of Accreditation)



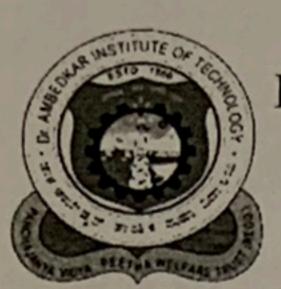


Aided By Govt. of Karnataka

Board of Studies

held on 13th, August 2020

MCA BoS Meeting Proceedings



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Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institution, Affiliated to V T U, Belagavi) Master of Computer Applications (MCA)

MINUTES OF BOARD OF STUDIES MEETING – MCA BOARD VENUE : MCA Department 13th August 2020

The Board of Studies meeting of MCA Program was held through online on 13th of August 2020 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology, Bengaluru

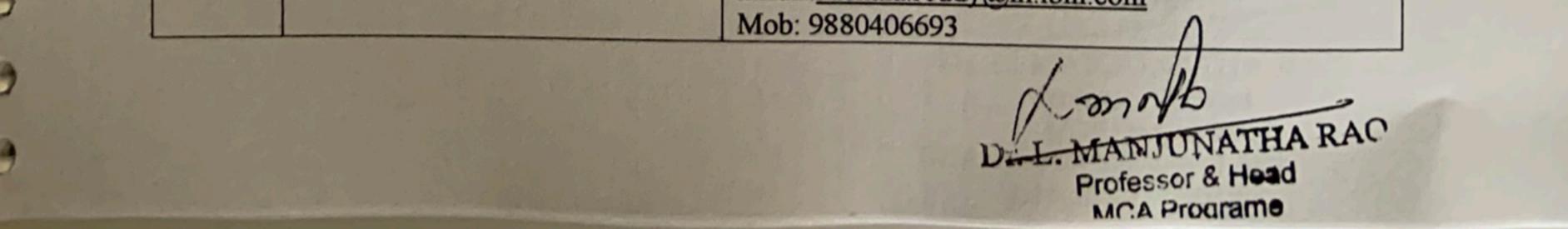
AGENDA:

- Finalization of MCA curriculum Scheme for two years duration (2020-22 scheme for 100 credits)
- 2. Finalization of I year Syllabus for 2020 2022 scheme.
- 3. Review of MCA V and VI semester syllabus of 2018-21 scheme.
- 4. Review of Vision, Mission, and Program Educational Objectives of MCA program
- 5. Proposing Inter department Electives
- 6. Any other curriculum related matter

The following are the members of Board of Studies

Sl. No	Nomination of the Committee	Member Details	
	Chairman	Dr. L. Manjunatha Rao	
		Professor & Head, Dept. of M.C.A	

1		Dr. A.I.T, Bangalore-56
		Email: manjuarjun2004@yahoo.com
		Mob: 9341214327
2.	VTU Nominee	Dr. N.P Kavya.
		Professor and Director, MCA Program
		RNSIT, Bengaluru
		Email: npkavya@gmail.com
	and the second sec	Mob: 9945275345
3.	R & D representative	Prof. M R Muralidharan
		Principal Research Scientist
	the second s	IISc, Bengaluru
	and the second sec	Email:murali@iisc.ac.in
		Ph: 22932895
4		Dr. Hanumanthappa. M
		Professor & Director(IQAC-NAAC)
	the set the set of the set of the set	Department of Computer Science & Applications,
		Bangalore University, Bangalore 56.
		Email:hanu6572@gmail.com
		Ph:9448819017, 080-22961451
	External Subject Experts	Dr. Daya Sagar
	and the second of the second of the second of the	Professor, Systems Science and Informatics Unit
		Indian Statistical Institute-Bangalore Centre,
		Bengaluru
	and the second	Email: bsdsagar@isibang.ac.in
Sec. Sec.	all and the second of the second of the second of	+91-9880893291
5	Industry Representative	Mr. Mekala V. Reddy
		Business Operations Leader
		IBM, Bengaluru
		Email: Mekala.reddy@in.ibm.com



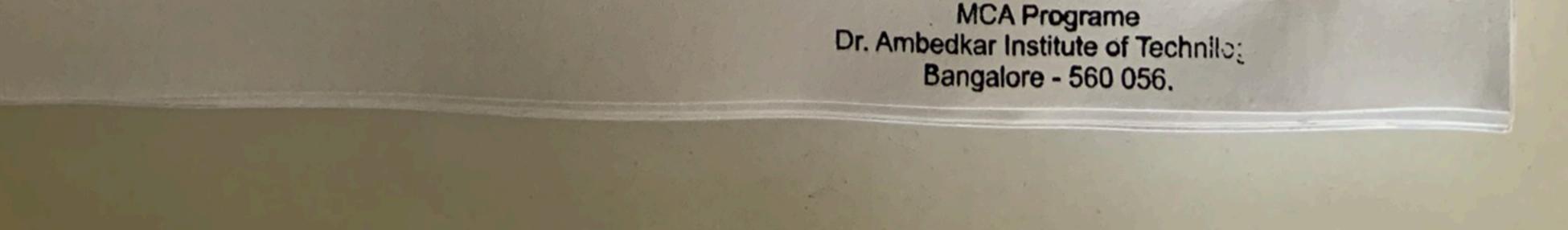
Sl. No	Nomination of the Committee	Member Details
6	Member - Alumni	Mr. Varun Patel
1 1 2 2 1		Consultant
2 3 200	the second is a second s	Quinnox
		Bangalore
	and so all the Constant Last the street	Email: varunpatel3069@gmail.com
		Mob: 9886850355
1.2. 7	A state to an and the state of the	Dr. Bharathi.S
E		Professor(CAS), Dept. of M.C.A
		Dr. A.I.T, Bangalore-56
1 the second		Email: bharathishivu s@yahoo.co.in
		Mob: 9902084476
	15 Mar Bran Bran and market and the	Dr. Indumathi. S. K
		Associate Professor, Dept. of M.C.A
1. 188 . 194	Provide and the second of the second of	Dr. A.I.T, Bangalore-56
7	Internal Frank M. 1	Email: indukarthik2009@yahoo.in
	Internal Faculty Members with	Mob: 9739910995
and the second	Various specializations	Ms. Shobha Rani. B.R
		Associate Professor, Dept. of M.C.A
the second	the a second without when a second	Dr. A.I.T, Bangalore-56
State and		Email: shobhakrishna8@gmail.com
A Street Street		Mob: 9740098198
And the second	Revenue and a second and a second and	Ms. Anitha J
	The second s	Assistant Professor, Dept of M.C.A.

and a second as the factor	Dr. AII, Bangalore – 56
a state of the second second	Email: alochan@rediffmail.com

The Board of Studies has recommended the following points after detailed deliberations.

- 1. The HOD invited all the BoS members to the Google meet and welcomed all the members individually. All the members were present for the meeting.
- The HOD has presented the scheme and syllabus of 2020-22 of 2 years MCA Programme for 100 credits in detail and discussed semester wise, each member has suggested few changes as listed in the following points.
- Mathematical Foundations for Computer Applications in I semester is to be redesigned to have 2 modules of statistics to support data science subjects as suggested by Dr. Dayasagar Sir and Mr. Mekala V. Reddy Sir.
- 4. Dr. Muralidharan sir has proposed to change the course title in the second semester from Network Architecture and Management to Network Architecture and Programming.

Dr. L. MANJUNATHA RAO Professor & Head



- Dr. N.P. Kavya madam has proposed to change the course title in the second semester as Web Technologies instead of Advances in Web Technologies and also suggested to emphasize more on fundamentals.
- Dr. N.P. Kavya madam has suggested to remove the NOSQL Databases course and introduce RDBMS course in the second semester and also suggested to include NOSQL as one of the modules in Big Data Analytics as elective course.
- Dr. N.P. Kavya madam has suggested changing the course title from Industry Internship and MOOC Course to MOOC Course and Industry Internship in the fourth semester.
- Mr. Varun has suggested to advice the students to take up the same problem for both internship and project work to gain more technical knowledge and confidence in the same domain.
- Mr. Mekhala V. Reddy sir has suggested to register a MOOC course in the same area of internship and project to get in depth technical skills in a specific area of interest.
- 10. The members appreciated the listed courses and suggested the department to implement all the courses effectively.
- 11. The members of BoS recommended the scheme and syllabus of 2020-22 scheme for 100 credits

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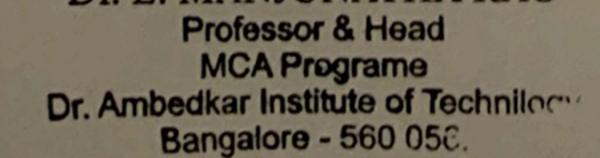
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- with the above specified updations and the same shall be implemented from the academic year 2020 onwards.
- 12. The HOD has presented the scheme and syllabus of V and VI semesters of 2018-21 scheme of three years MCA Programme which will be implemented during 2020-21 onwards.
- 13. The members reviewed the 2018-21 scheme and suggested to change the course title as Machine Learning using Python (18MCA51) instead of Machine Learning in the fifth semester and recommended the syllabus of MCA V and VI semesters to implement from the academic year 2020-21 onwards.
- 14. The members reviewed the department vision, mission and PEOs and recommended the same.
- 15. The BoS has recommended the list of inter department electives.
- 16. The BoS meeting was concluded with vote of thanks by the BoS Chairman

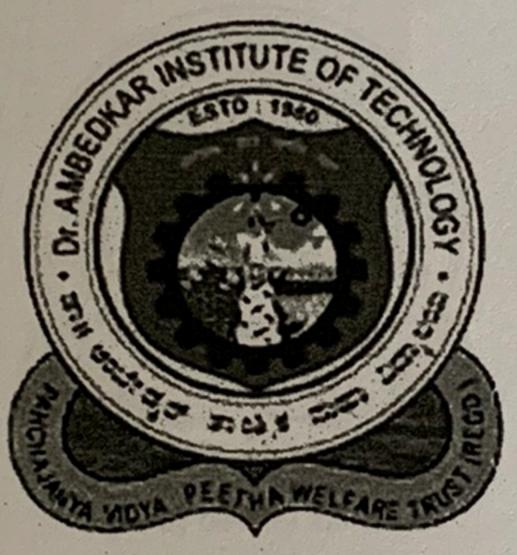
MCA Program Dr. Ambedkar Institute of Technology

Dr. L. MANJUNATHA RAO



Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications Program (Accredited by National Board of Accreditation)



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Scheme And Syllabus of MCA 2 years (100 Credits)

Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications Program (Accredited by National Board of Accreditation)



MCA I – IV semester Syllabus Two Years Duration (2020 – 2022)

Dr. Ambedkar Institute of Technology, Bengaluru – 560056 Master of Computer Applications

Institute - Vision and Mission

Vision

To create Dynamic, Resourceful, Adept and Innovative Technical professionals to meet global challenges.

Mission

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Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA FIRST SEMESTER (AUTONOMOUS) 2020-2022

			Teac	hing hours p	er week	Ex	aminatio	on		Credits
SI. No.	Course Code	Course Title	Lecture	Tutorial/ Seminar/ Assignment	Practical / Project	Duration in hours	SEE Marks	CIE Marks	Total Marks	
1	20MCA11	Object Oriented Programming using Java	4	-	-	3	50	50	100	4
2	20MCA12	Data Structures and Algorithms	4	-	-	3	50	50	100	4
3	20MCA13	Web Technologies	4	-	-	3	50	50	100	4
4	20MCA14	RDBMS	3	-	2	3	50	50	100	4
5	20MCA15	Mathematical and Statistical Modelling for Computer Applications	4	-	-	3	50	50	100	4
6	20MCAL16	Object Oriented Programming using Java Lab	-	-	2	3	50	50	100	1
7	20MCAL17	Data Structures and Algorithms Lab	-		2	3	50	50	100	1
8	20MCAM18	Mini Project in Web Technologies	-	2	2	3	50	50	100	2
9	20MCAB19	Principles of Programming (Bridge Course – Non-credit)	3	-	-	3	50	50	100	0
		Total	22	02	08	27	450	450	900	24

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA SECOND SEMESTER (AUTONOMOUS) 2020-2022

			Teachi	ng hours per	week		Exa	mination		Credits
SI. No.	Course Code	Course Title	Lecture	Tutorial/ Seminar/ Assignment	Practical / Project	Duration in hours	SEE Marks	CIE Marks	Total Marks	
1	20MCA21	Python Programming	4	-	-	3	50	50	100	4
2	20MCA22	Internet of Things	4	-	-	3	50	50	100	4
3	20MCA23	Software Engineering and Project Management	4	-	-	3	50	50	100	4
4	20MCA24	Research Methodology	3	-	-	3	50	50	100	3
5	20MCA25	Elective – 1	3		2	3	50	50	100	4
6	20MCA26	Elective - 2	3	-	-	3	50	50	100	3
7	20MCAL27	Python Programming Lab	-	-	2	3	50	50	100	1
8	20MCAL28	Internet of Things Lab	-		2	3	50	50	100	1
09	20MCAM29	Mini Project in Mobile Application Development	-	2	2	3	50	50	100	2
	Т	otal	21	02	08	27	450	450	900	26

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications MCA SECOND SEMESTER ELECTIVE COURSES

S.No	Course Code	Course Title
1.	20MCA251	Cyber Security
2.	20MCA252	Software Testing and Automation
3.	20MCA253	Data Science using R
4.	20MCA254	Programming using C#
5.	20MCA255	Ethical Hacking

Elective – 1

Elective – 2

S.No	Course Code	Course Title
1.	20MCA261	Data Mining and Business Intelligence
2.	20MCA262	Enterprise Resource Planning
3.	20MCA263	Supply Chain Management
4.	20MCA264	Storage Area Networks
5.	20MCA265	Distributed Operating Systems

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) **Department of Master of Computer Applications** SCHEME OF TEACHING AND EXAMINATION OF MCA THIRD SEMESTER (AUTONOMOUS) 2020-2022

			Teac	ching hours week	s per		Exami	nation		-
SI. No.	Course Code	Course Title	Lecture	Tutorial/ Seminar/ Assignme	Practical / Project	Duration in hours	SEE Marks	CIE Marks	Total Marks	Credits
1	20MCA31	Machine Learning using Python	4	-	-	3	50	50	100	4
2	20MCA32	Advanced Java Programming	4	-	-	3	50	50	100	4
3.	20MCA33	Network Architecture and Programming	3	-	2	3	50	50	100	4
4	20MCA34	Elective – 3	3		2	3	50	50	100	4
5	20MCA35	Elective - 4	3		-	3	50	50	100	3
6	20MCAL36	Machine Learning using Python Lab	-	-	2	3	50	50	100	1
7	20MCAL37	Advanced Java Programming Lab	-	-	2	3	50	50	100	1
8	20MCAM38	Mini Project	-	-	4	3	50	50	100	2
9.	20MCAS39	Technical Seminar	-	-	2	-	-	50	50	2
	Total			00	12	27	400	450	850	25

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications MCA THIRD SEMESTER ELECTIVE COURSES

S.No	Course Code	Course Title
1.	20MCA341	Digital Marketing
2.	20MCA342	Cloud Computing
3.	20MCA343	Big Data Analytics
4.	20MCA344	Programming using GOLang
5.	20MCA345	Full Stack Web Development

Elective – 3

Elective-4

S.No	Course Code	Course Title
1.	20MCA351	Block Chain Technology
2.	20MCA352	5G Wireless Technologies
3	20MCA353	Artificial Intelligence
4.	20MCA354	Software Architecture and Design Patterns
5.	20MCA355	Graph Theory

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade)

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA FOURTH SEMESTER (AUTONOMOUS) 2020-2022

			Teaching hours per week			Examination				
Sl. No.	Course Code	Course Title	Lecture	Tutorial	Practical / Seminar	Duration in hours	SEE Marks	CIE Marks	Total Marks	Credits
1.	20MCAI41	MOOC Course and Industry Internship	-	-	2	3	50	50	100	5
2.	20MCAP42	Project Work	-	-	4	3	150	100	250	20
Total 6					6	200	150	350	25	
	Grand Total									3000

Dr. Ambedkar Institute of Technology

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA INTERDEPARTMENT ELECTIVE (AUTONOMOUS) 2020-2022

			Teaching hours per week			Examination					
SI. No.	Course Code	Course Title	Lecture	Tutorial	Practical / Seminar	Duration in hours	SEE Marks	CIE Marks	Total Marks	Credits	Eligibility
1	20MCAE01	Data Science using Python	3	-	-	3	50	50	100	3	All Branches
2.	20MCAE02	Professional Practices for Higher Education	3	-	-	3	50	50	100	3	All Branches
3.	20MCAE03	R programming for statistics and data Science	3			3	50	50	100	3	All Branches
4.	20MCAE04	Full stack web development	3			3	50	50	100	3	All Branches
5.	20MCAE05	Animation and Gaming	3			3	50	50	100	3	All Branches
6.	20MCAE06	Ethical Hacking	3			3	50	50	100	3	All Branches
	Total		6	-	-	6	100	100	200	06	

Dr. Ambedkar Institute of Technology

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications (AUTONOMOUS) 2020-2022

Components	Semester 1 (Credits)	Semester 2 (Credits)	Semester 3 (Credits)	Semester 4 (Credits)	Total (Credits)
Core Courses	20	15	12	-	47
Elective Courses	-	07	07	-	14
Lab Courses	04	04	02	-	10
Mini Project	-	-	02	-	02
Seminar	-	-	02	-	02
Internship	-	-	-	05	05
Project	-	-	-	20	20
Non-Credit Course	1 course	-	-		1 course
Total Credits	24	26	25	25	100
Total Marks	900	900	850	350	3000

MCA Course Matrix

Dr. Ambedkar Institute of Technology, Bengluru-56

(An Autonomous Institute, Approved by AICTE, Affiliated to V T U, Belagavi) Nationally Accredited by NAAC with 'A' Grade

Master of Computer Applications

(Accredited by National Board of Accreditation)



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Aided By Govt. of Karnataka

BOARD OF STUDIES

HELD ON 15th of June 2021

MCA BoS Meeting Proceedings

1



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Dr. Ambedkar Institute of Technology, Bengluru-56

(An Autonomous Institute, Approved by AICTE, Affiliated to V T U, Belagavi) Nationally Accredited by NAAC with 'A' Grade

Master of Computer Applications

(Accredited by National Board of Accreditation)



Aided By Govt. of Kamataka

BOARD OF STUDIES

HELD ON 15th of June 2021

- 1. MCA BoS Meeting Proceedings
- 2. Scheme and Syllabus of MCA 2020-2022
- 3. Scheme and Syllabus of MCA V and VI semester of 2018-2021
- 4. Scheme and Syllabus of Inter department Electives



Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institution, Affiliated to V T U, Belagavi) Master of Computer Applications (MCA)

MINUTES OF BOARD OF STUDIES MEETING – MCA BOARD VENUE : MCA Department 15th June 2021

The Board of Studies meeting of MCA Program was held through online on 15th of June 2021 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology, Bengaluru.

AGENDA:

- 1. Finalization of III and IV semester (II year) Syllabus for 2020 2022 scheme.
- 2. Review of MCA I and II semester syllabus of 2020-22 scheme.
- 3. Review of MCA V and VI semester syllabus of 2018-21 scheme
- 4. Review of Vision, Mission, and Program Educational Objectives of MCA program
- 5. Proposing Inter department Electives
- 6. Any other curriculum related matter

Sl. No	Nomination of the Committee	Member Details		
1	Chairman	Dr. Bharathi.S Professor(CAS), Dept. of M.C.A Dr. A.I.T, Bangalore-56 Email: bharathi.mca@drait.edu.in		
		Mob: 9902084476		
2.	VTU Nominee	Dr. N.P Kavya. Professor and Director, MCA Program RNSIT, Bengaluru		
		Email: <u>npkavya@gmail.com</u> Mob: 9945275345		
3.	R & D representative	ProfM R Muralidharan Principal Research Scientist IISc, Bengaluru Email: <u>murali@iisc.ac.in</u> Ph: 22932895		
4		Dr. Ashoka S. B. Assistant Professor & PG Coordinator Department of Computer Science Maharani Cluster University Bengaluru – 560 001 dr.ashoksbcs@gmail.com		
	External Subject Experts	Dr. Daya Sagar Professor, Systems Science and Informatics Unit Indian Statistical Institute-Bangalore Centre Bengaluru Email: <u>bsdsagar@isibang.ac.in</u> +91-9880893291		
5	Industry Representative	Mr. Mekala V. Reddy Business Operations Leader IBM, Bengaluru Email: <u>Mekala.reddy@in.ibm.com</u> Mob: 9880406693		

The following are the members of Board of Studies

Sl. No	Nomination of the Committee	Member Details	
6	Member - Alumni	Mr. Varun Patel Consultant Quinnox Bangalore Email: varunpatel3069@gmail.com Mob: 9886850355	
7	Internal Faculty Members with Various specializations	Dr. Indumathi. S. K Associate Professor, Dept. of M.C.A Dr. A.I.T, Bangalore-56 Email: <u>indumathi.mca@drait.edu.in</u> Mob: 9739910995 Ms. Shobha Rani. B.R Associate Professor, Dept. of M.C.A Dr. A.I.T, Bangalore-56 Email: <u>shobharani.mca@drait.edu.in</u> Mob: 9740098198 Ms. Anitha J Assistant Professor, Dept of M.C.A. Dr. A.I.T., Bangalore – 56 Email: <u>anitha.mca@drait.edu.in</u> Mob: 9845518391	•

The Board of Studies has recommended the following points after detailed deliberations.

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- The HOD invited all the BoS members to the Google meet and welcomed all the members individually.
- The HOD has presented the scheme and syllabus of 2020-22 of 2 years MCA Programme for 100 credits in detail and discussed semester wise, each member has suggested few changes as listed in the following points.
- Dr. Muralidharan sir has proposed to change the course title of 20MCA32 in the III semester from Advances in Java Programming to Advanced Java Programming.
- Dr. N.P. Kavya madam has proposed to include a program on Q-Learning in Machine learning using python lab (20MCAL36).
- Dr. Muralidharan sir has proposed to include any network tool like wireshark in the network architecture and programming (20MCA33).
- Mr. Varun has suggested to rename a module in Full stack web development (20MCA345) as Exposing REST APIs.

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- 7. Dr. N.P. Kavya madam has suggested that the student technical seminar in the III semester to be related to the mini project (20MCAS39).
- 8. Dr. N.P. Kavya madam has suggested to include the industry certification courses along with MOOC Courses (20MCAI41) in the IV semester.
- 9. The BoS members recommended to rearrange the concepts of statistics in research methodology (20MCA24) and mathematical and statistical foundations for computer applications (20MCA15) in the I year syllabus.
- 10. The BoS has recommended modifications in the course content of Web Technologies (20MCA13) in I semester.
- 11. The BoS has suggested to include the ethical hacking tools in the course content of Ethical Hacking (20MCA255) in II semester.
- 12. The BoS has approved the list of interdepartment electives.
- 13. The members appreciated the designed curriculum and suggested the department to implement all the courses effectively.
- 14. The members of BoS recommended the scheme and syllabus of 2020-22 scheme for 100 credits . with the above specified updations and the same shall be implemented from the academic year 2021-22 onwards.

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- 15. The HOD has presented the scheme and syllabus of V and VI semesters of 2018-21 scheme of three years MCA Programme which will be implemented during 2021-22 ...
- 16. The members reviewed the department vision, mission and PEOs and recommended the same.
- 17. The BoS meeting was concluded with vote of thanks by the BoS Chairman

2Hto

Chairman - BoS Dr. Ambedkar Institute of Technology Dept: of Master of Computer Application MCA Program Dr. Ambedkar Institute of Technology

Sangalore - 560 058

This is to inform that the Board of Studies meeting of MCA Program was held through online on 15th of June 2021 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology, Bengaluru.

I have reviewed the syllabus of MCA I and II semester syllabus of 2020-22 scheme and III & IV semester (II year) Syllabus for 2020 - 2022 scheme found the following changes which can be incorporated as mentioned below.

Comments/ Suggestions

I hereby indicate my approval for the revised syllabus of MCA after conduction of BOS meeting held on 15th June 2021 ,as the suggestions are well incorporated

#	Name of the Nominated Member	Institution	Signature with Date
1.	Dr Kavya N P	RNSIT,Bengaluru	-12mg

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This is to inform that the Board of Studies meeting of MCA Program was held through online on 15th of June 2021 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology, Bengaluru.

I have reviewed the syllabus of MCA I and II semester syllabus of 2020-22 scheme and III & IV semester (II year) Syllabus for 2020 – 2022 scheme found the following changes which can be incorporated as mentioned below.

Comments/ Suggestions

i) The changes suggested are incorporated in the syllabus.

	Name of the Nominated Member	Institution	Signature with Date				
2.	M.R. Muralidharan	Indian Institute of Science	MP Curdelt_				
	M.K. Murandharan	Bangalore	5/7/2021				

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This is to inform that the Board of Studies meeting of MCA Program was held through online on 15th of June 2021 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology. Bengaluru.

I have reviewed the syllabus of MCA I and II semester syllabus of 2020-22 scheme and III & IV semester (II year) Syllabus for 2020 – 2022 scheme found the following changes which can be incorporated as mentioned below.

Comments/ Suggestions

- i) The syllabus is Very Useful for students to seek their career in industries.
- if) Introducing Industry level courses helps a lot for students as well as faculties
- iii) The changes suggested are incorporated in the syllabus

#	Name of the Nominated Member	Institution	Signature with Date
1.	Dr Ashoka .S.B	Maharani Cluster University.	[Dr. ASHOKA S. B.]

This is to inform that the Board of Studies meeting of MCA Program was held through online on 15th of June 2021 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology, Bengaluru.

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I have reviewed the syllabus of MCA I and II semester syllabus of 2020-22 scheme and III & IV semester (II year) Syllabus for 2020 – 2022 scheme found the following changes which can be incorporated as mentioned below.

Comments/ Suggestions

i) The changes suggested are incorporated in the syllabus.

ii) Syllabus is formed based on Emerging Trends in Information Technology.

#	Name of the Nominated Member	Institution	Signature with Date				
1.	B. S. Daya Sagar	Indian Statistical Institute – Bangalore Centre	B.S. Deg- Se				

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This is to inform that the Board of Studies meeting of MCA Program was held through online on 15th of June 2021 at 11.00 a.m.in the MCA Department at Dr. Ambedkar Institute of Technology, Bengaluru.

I have reviewed the syllabus of MCA I and II semester syllabus of 2020-22 scheme and III & IV semester (II year) Syllabus for 2020 – 2022 scheme found the following changes which can be incorporated as mentioned below.

Comments/ Suggestions

i) The changes suggested are incorporated in the syllabus.

ii) Syllabus is formed based on Emerging Trends in Information Technology.

#	Name of the Nominated Member	Institution	Signature with Date
3.	Varun Patel S	Dr. A.I.T.	Vorun Patul .

Dr. Ambedkar Institute of Technology, Bengaluru-56 (An Autonomous Institute, Affiliated to VTU, Belagavi)

Master of Computer Applications Program (Accredited by National Board of Accreditation)



MCA I – IV semester Syllabus Two Years Duration (2020 – 2022)

Dr. Ambedkar Institute of Technology, Bengaluru – 560056 Master of Computer Applications

Institute - Vision and Mission

Vision

To create Dynamic, Resourceful, Adept and Innovative Technical professionals to meet global challenges.

Mission

- To offer state-of-the-art under graduate, post graduate and doctoral programs in the fields of Engineering, Technology and Management
- To generate new knowledge by engaging faculty and students in research, development and innovation.
- To provide strong theoretical foundation to the students, supported by extensive practical training to meet the industrial requirements.
- To instil moral and ethical values with social and professional commitment.

DEPARTMENT - VISION AND MISSION

VISION

To create a quality human resource with good technical competence to face the global challenges.

MISSION

- To create a Centre of Excellence through industry institute interaction.
- To prepare students for utilizing more creativity, innovativeness and leadership Qualities.
- To inculcate a sense of commitment to the students towards socio-economic development of the nation

Program Educational Objectives

PEO 1: Graduates are prepared to be employed in IT industries and be engaged in learning, understanding, and applying new ideas.

PEO 2: To prepare students for utilizing more creativity, innovativeness and leadership Qualities.

PEO 3: To provide an opportunity to students to learn the latest trends in computer technology and make them ready for life-long learning process with leadership skills and corporate social responsibilities.

Program Outcomes:

PO 1: Ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modelling and design of computer based systems.

PO 2: Graduates will be able to demonstrate with excellent programming, analytical, logical and problem solving skills.

PO 3: Graduates will be able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability.

PO 4: An ability to devise and conduct experiments, interpret data and provide well informed conclusions.

PO 5: An ability to select modern computing tools and techniques and use them with dexterity.

PO 6: An ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude.

PO 7: An ability to appreciate the importance of goal setting and to recognize the need for lifelong learning.

PO 8: Develop and maintain medium to large scale application software using theoretical and applied knowledge of software engineering and project management.

PO 9: An ability to communicate effectively.

PO 10: An ability to understand the impact of system solutions in a contemporary, global, economical, environmental, and societal context for sustainable development.

PO 11: An ability to execute the project either individually or in a group.

PO 12: An ability to become an Entrepreneur in the field of information technology to create a value and wealth for the betterment of the individual and society at large.

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA FIRST SEMESTER (AUTONOMOUS) 2020-2022

				hing hours p	er week	Examination				Credits
SI. No.	Course Code	Course Title	Lecture	Tutorial/ Seminar/ Assignment	Practical / Project	Duration in hours	SEE Marks	CIE Marks	Total Marks	
1	20MCA11	Object Oriented Programming using Java	4	-	-	3	50	50	100	4
2	20MCA12	Data Structures and Algorithms	4	-	-	3	50	50	100	4
3	20MCA13	Web Technologies	4	-	-	3	50	50	100	4
4	20MCA14	RDBMS	3	-	2	3	50	50	100	4
5	20MCA15	Mathematical and Statistical Modelling for Computer Applications	4	-	-	3	50	50	100	4
6	20MCAL16	Object Oriented Programming using Java Lab	-	-	2	3	50	50	100	1
7	20MCAL17	Data Structures and Algorithms Lab	-		2	3	50	50	100	1
8	20MCAM18	Mini Project in Web Technologies	-	2	2	3	50	50	100	2
9	20MCAB19	Principles of Programming (Bridge Course – Non-credit)	3	-	-	3	50	50	100	0
	Total			02	08	27	450	450	900	24

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA SECOND SEMESTER (AUTONOMOUS) 2020-2022

			Teachi	ng hours per	week		Credits			
SI. No.	Course Code	Course Title	Lecture	Tutorial/ Seminar/ Assignment	Practical / Project	Duration in hours	SEE Marks	CIE Marks	Total Marks	
1	20MCA21	Python Programming	4	-	-	3	50	50	100	4
2	20MCA22	Internet of Things	4	-	-	3	50	50	100	4
3	20MCA23	Software Engineering and Project Management	4	-	-	3	50	50	100	4
4	20MCA24	Research Methodology	3	-	-	3	50	50	100	3
5	20MCA25	Elective – 1	3		2	3	50	50	100	4
6	20MCA26	Elective - 2	3	-	-	3	50	50	100	3
7	20MCAL27	Python Programming Lab	-	-	2	3	50	50	100	1
8	20MCAL28	Internet of Things Lab	-		2	3	50	50	100	1
09	20MCAM29	Mini Project in Mobile Application Development	-	2	2	3	50	50	100	2
	Total		21	02	08	27	450	450	900	26

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications MCA SECOND SEMESTER ELECTIVE COURSES

S.No	Course Code	Course Title
1.	20MCA251	Cyber Security
2.	20MCA252	Software Testing and Automation
3.	20MCA253	Data Science using R
4.	20MCA254	Programming using C#
5.	20MCA255	Ethical Hacking

Elective – 1

Elective – 2

S.No	Course Code	Course Title
1.	20MCA261	Data Mining and Business Intelligence
2.	20MCA262	Enterprise Resource Planning
3.	20MCA263	Supply Chain Management
4.	20MCA264	Storage Area Networks
5.	20MCA265	Distributed Operating Systems

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) **Department of Master of Computer Applications** SCHEME OF TEACHING AND EXAMINATION OF MCA THIRD SEMESTER (AUTONOMOUS) 2020-2022

			Teac	ching hours week	s per	Examination				
SI. No.	Course Code	Course Title	Lecture	Tutorial/ Seminar/ Assignme	Practical / Project	Duration in hours	SEE Marks	CIE Marks	Total Marks	Credits
1	20MCA31	Machine Learning using Python	4	-	-	3	50	50	100	4
2	20MCA32	Advanced Java Programming	4	-	-	3	50	50	100	4
3.	20MCA33	Network Architecture and Programming	3	-	2	3	50	50	100	4
4	20MCA34	Elective – 3	3		2	3	50	50	100	4
5	20MCA35	Elective - 4	3		-	3	50	50	100	3
6	20MCAL36	Machine Learning using Python Lab	-	-	2	3	50	50	100	1
7	20MCAL37	Advanced Java Programming Lab	-	-	2	3	50	50	100	1
8	20MCAM38	Mini Project	-	-	4	3	50	50	100	2
9.	20MCAS39	Technical Seminar	-	-	2	-	-	50	50	2
	Total		17	00	12	27	400	450	850	25

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications MCA THIRD SEMESTER ELECTIVE COURSES

S.No	Course Code	Course Title
1.	20MCA341	Digital Marketing
2.	20MCA342	Cloud Computing
3.	20MCA343	Big Data Analytics
4.	20MCA344	Programming using GOLang
5.	20MCA345	Full Stack Web Development

Elective – 3

Elective-4

S.No	Course Code	Course Title
1.	20MCA351	Block Chain Technology
2.	20MCA352	5G Wireless Technologies
3	20MCA353	Artificial Intelligence
4.	20MCA354	Software Architecture and Design Patterns
5.	20MCA355	Graph Theory

Dr. Ambedkar Institute of Technology (An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) **Department of Master of Computer Applications** SCHEME OF TEACHING AND EXAMINATION OF MCA FOURTH SEMESTER (AUTONOMOUS) 2020-2022

			Teaching hours per week			Examination				
Sl. No.	Course Code	Course Title	Lecture	Tutorial	Practical / Seminar	Duration in hours	SEE Marks	CIE Marks	Total Marks	Credits
1.	20MCAI41	MOOC Course and Industry Internship	-	-	2	3	50	50	100	5
2.	20MCAP42	Project Work	-	-	4	3	150	100	250	20
	Total 6						200	150	350	25
	Grand Total									3000

Dr. Ambedkar Institute of Technology

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications SCHEME OF TEACHING AND EXAMINATION OF MCA INTERDEPARTMENT ELECTIVE (AUTONOMOUS) 2020-2022

			Teaching hours per week			Examination					
SI. No.	Course Code	Course Title	Lecture	Tutorial	Practical / Seminar	Duration in hours	SEE Marks	CIE Marks	Total Marks	Credits	Eligibility
1	20MCAE01	Data Science using Python	3	-	-	3	50	50	100	3	All Branches
2.	20MCAE02	Professional Practices for Higher Education	3	-	-	3	50	50	100	3	All Branches
3.	20MCAE03	R programming for statistics and data Science	3			3	50	50	100	3	All Branches
4.	20MCAE04	Full stack web development	3			3	50	50	100	3	All Branches
5.	20MCAE05	Animation and Gaming	3			3	50	50	100	3	All Branches
6.	20MCAE06	Ethical Hacking	3			3	50	50	100	3	All Branches
	Total		6	-	-	6	100	100	200	06	

Dr. Ambedkar Institute of Technology

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade) Department of Master of Computer Applications (AUTONOMOUS) 2020-2022

Components	Semester 1 (Credits)	Semester 2 (Credits)	Semester 3 (Credits)	Semester 4 (Credits)	Total (Credits)
Core Courses	20	15	12	-	47
Elective Courses	-	07	07	-	14
Lab Courses	04	04	02	-	10
Mini Project	-	-	02	-	02
Seminar	-	-	02	-	02
Internship	-	-	-	05	05
Project	-	-	-	20	20
Non-Credit Course	1 course	-	-		1 course
Total Credits	24	26	25	25	100
Total Marks	900	900	850	350	3000

MCA Course Matrix