



**THE NATIONAL INSTITUTE OF ENGINEERING MYSURU – 570 008**  
**(Autonomous Institution under VTU)**

**Master of Computer Applications**

**Scheme**

**and**

**Blown up Syllabus**

**I – IV Semester MCA**  
**(2 years Scheme)**

**(2021 – 2023)**

**Department of MCA**  
**The National Institute of Engineering,**  
**Manandavadi Road, Mysore – 570008.**

## **Department of Master of Computer Applications**

### **MISSION OF THE INSTITUTION**

- To impart state-of-the-art engineering education through strong theoretical foundations and practical training to students in their choice of specialization.
- To create new knowledge through innovation and cutting-edge research in science and engineering.
- To provide a platform for inclusiveness and collaboration by following ethical and responsible engineering practices for long-term interaction with academia and industry.
- To encourage entrepreneurship and to develop sustainable technologies for the benefit of global society.

### **VISION OF THE INSTITUTION**

- “MCA will be an outstanding department contributing significantly to teaching, research and consultancy, through well-equipped laboratories and well-trained staff to meet global challenges in the field of computer engineering & applications”

### **MISSION OF THE PROGRAM**

- To impart quality technical education and provide skills in Computer Application through best of practices.
- To produce graduates who can contribute professionally to the society and widely as IT professionals or entrepreneurs.

## GRADUATE ATTRIBUTES

### 1. **Computational Knowledge:**

Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

### 2. **Problem Analysis:**

Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing Sciences and relevant domain disciplines.

### 3. **Design / Development of solutions:**

Design and evaluate solutions for complex computing problems and evaluate systems, components or processes that meet specified needs with appropriate considerations for public health and safety, cultural societal and environmental considerations.

### 4. **Conduct Investigations of complex computing problems:**

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

### 5. **Modern Tool Usage:**

Create, select, adopt, and apply appropriate techniques, resources and modern computing tools to complex computing activities with an understanding of the limitations.

### 6. **Professional Ethics:**

Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

### 7. **Lifelong Learning:**

Recognize the need and have the ability to engage in independent learning for continual development as a Computing Professional.

### 8. **Project Management and Finance:**

Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work as a member and leader in a team to manage projects and in multidisciplinary environments.

### 9. **Communication Ecacy:**

Communicate effectively with the computing community and society at large about complex computing activities by being able to comprehend and write effective reports and design documentation, make elective presentations and give and understand clear instructions.

### 10. **Societal and environmental concern:**

Understand and assess societal, environmental, health safety, legal and cultural issues within local and global contexts and consequential responsibilities relevant to professional computing practice.

### **11. Individual and Teamwork**

Function effectively as an individual and as a member or leader in diverse teams in multi-disciplinary environments.

### **12. Innovation and entrepreneurship:**

Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

## **PROGRAM EDUCATIONAL OBJECTIVES**

**The Department will produce graduates who**

**PEO1 :** Work productively as IT professional both at supportive and leadership roles.

**PEO2 :** Advance Successfully in their chosen career path utilizing technical abilities, leadership qualities, communication, and interpersonal skills with high regard to legal and ethical responsibilities.

**PEO3 :** Build their profession adopting to the changes in the technology with lifelong learning.

## **PROGRAM SPECIFIC OUTCOMES**

**PSO1 :** MCA graduates will be able to understand and analyze computer systems, focused with hardware, software, and application needs.

**PSO2 :** Develop software and hardware systems/solutions, with a knowledge of software design life cycle process and skills with a broad range of programming tools and platforms.

## **PROGRAM OUTCOMES**

### **Graduates will have an**

- PO1** : Ability to apply knowledge of mathematics, computer science and domain knowledge to solve problems in the computational world.
- PO2** : Ability to analyze real world/scientific problems and convert them to computable algorithm.
- PO3** : Ability to evaluate, analyze and use available technological solutions to design and implement the same.
- PO4** : Ability to work with complex computing problem environment, use knowledge both technical and research to provide valid conclusions of experiments based on analysis and interpretation of data.
- PO5** : Ability to use/evaluate the various software tools and networking requirements for solutions.
- PO6** : Ability to adhere to the professional ethics, follow cyber rules and regulations and be a responsible citizen.
- PO7** : Ability to be a lifelong learner in the field of computer science.
- PO8** : Ability to demonstrate the knowledge and understanding hardware, software, networking and Finance requirements for the Society
- PO9** : Ability to communicate effectively with the fellow members and also with other uses of the computing community and society.
- PO10** : Ability to experience the industrial environment for understanding the impact of computational solutions in a global and societal context.
- PO11** : Ability to function effectively as an individual and also work collaboratively in a team.
- PO12** : Ability to become leaders, entrepreneurs, and provide solutions to complex problems in life.

### **Suggested Plan of Study for Regular Students**

**Student has to earn 100 credits to get the degree of MCA**

<b>Semester</b>	<b>Credits</b>
First semester	25
Second semester	25
Third semester	26
Fourth semester	24
Total Credits	100

# Scheme

**SEMESTER I**

CourseCode	Course	Teaching Hours/week			Credits
		L	T	P	
2MFC1C01	Mathematical Foundation for Computer Application	3	0	0	3
2MCA1N01	Basics of Programming Concepts	3	0	0	0
2MCA1C01	Operating System	4	0	0	4
2MCA1C04	Data Structures with C	4	0	0	4
2MCA1C07	Web Technologies	3	0	0	3
2MCA1C08	Introduction to UNIX	3	0	2	4
2MCA1C09	Computer Organization and Architecture	4	0	0	4
2MCA1L01	Data Structures Lab	0	0	3	1.5
2MCA1L02	Web Technologies Lab	0	0	3	1.5
	<b>Total</b>	<b>24</b>	<b>0</b>	<b>8</b>	<b>25</b>



**SEMESTER II**

Course Code	Course	Teaching Hours/week			Credits
		L	T	P	
2MCA2C02	Computer Networks	4	0	0	4
2MCA2C03	Analysis and Design of Algorithms	3	2	0	4
2MCA2C05	Database Management Systems	3	0	0	3
2MCA2C06	Object Oriented Programming with Java	4	0	0	4
2MCA2E1XX	Elective –I	3	0	0	3
2MCA2E2XX	Elective –II	3	0	0	3
2MCA2L01	Java Programming Lab	0	0	3	1.5
2MCA2L03	DBMS Lab with Mini Project	0	0	3	1.5
2MCA2L04	Computer Networks Lab	0	0	2	1
	<b>Total</b>	<b>20</b>	<b>2</b>	<b>8</b>	<b>25</b>

**Elective Group I**

Course Code	Subjects	L	T	P	Credits
2MCA2E101	Cyber Security	3	0	0	3
2MCA2E102	Data Mining and Business Intelligence	3	0	0	3
2MCA2E103	Enterprise Resource Planning	3	0	0	3
2MCA2E104	Introduction to Artificial Intelligence	3	0	0	3

**Elective Group II**

Course Code	Subjects	L	T	P	Credits
2MCA2E201	Cryptography and Network Security	3	0	0	3
2MCA2E202	User Interface Design	3	0	0	3
2MCA2E203	Supply Chain Management	3	0	0	3
2MCA2E204	Distributed Operating Systems	3	0	0	3

**SEMESTER III**

Course Code	Course	Teaching Hours/week			Credits
		L	T	P	
2MCA3C02	C# and .NET	3	0	0	3
2MCA3C04	Internet-of-Things	3	2	0	4
2MCA3C06	Mobile Application Programming	3	0	0	3
2MCA3C07	Software Engineering	3	2	0	4
2MCA3C08	Data Analytics with Python	3	0	0	3
2MCA3E3XX	Elective –III	3	0	0	3
2MCA3E4XX	Elective –IV	3	0	0	3
2MCA3L01	Data Analytics with Python Lab	0	0	3	1.5
2MCA3L02	C# and .Net Lab	0	0	3	1.5
	<b>Total</b>	<b>21</b>	<b>4</b>	<b>6</b>	<b>26</b>

**Elective Group III**

Course Code	Subjects	L	T	P	Credits
2MCA3E301	Block Chain Technology	3	0	0	3
2MCA3E302	Digital Marketing	3	0	0	3
2MCA3E303	Software Testing	3	0	0	3
2MCA3E304	Cloud Computing	3	0	0	3

**Elective Group IV**

<b>Course Code</b>	<b>Subjects</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
2MCA3E401	Multimedia Systems	3	0	0	3
2MCA3E402	Introduction to Machine Learning	3	0	0	3
2MCA3E403	Digital Image Processing	3	0	0	3
2MCA3E404	Soft Computing	3	0	0	3

**SEMESTER IV**

<b>CourseCode</b>	<b>Course</b>	<b>Teaching Hours/week</b>			<b>Credits</b>
		<b>L</b>	<b>T</b>	<b>P</b>	
2MCA4MXX	MOOC Elective	-	-	-	2
2MCA4C02	Industry Internship (4 Weeks)	-	-	-	2
2MCA4C03	Major Project (16 weeks)	-	-	-	20
	<b>Total</b>				<b>24</b>

**MOOC ELECTIVE(Tentative)**

<b>CourseCode</b>	<b>Course</b>	<b>Teaching Hours/week</b>			<b>Credits</b>
		<b>L</b>	<b>T</b>	<b>P</b>	
2MCA4M01	Introduction to Research	2	0	0	2
2MCA4M02	Big Data Computing	2	0	0	2
2MCA4M03	Data Mining	2	0	0	2
2MCA4M04	Cloud Computing and Distributed System	2	0	0	2

**Guidelines for Internship:**

- Individual student must carry out Internship training at industry. Student shall submit a detailed report on internship work (15 to 20 Pages) in a format as specified by the department. Internal guide and industry personnel will evaluate the student performance for 50 Marks. By taking demonstration and presentation of the work carried during internship.
- Internship to be carried out during 3<sup>rd</sup> Semester vacation only

**Guidelines for Major Project:**

Individual student, one project per student, must carry out major project. Student must submit a Detailed Project Report (60 to 80 Pages) in a format as specified by the department. Internal guides will evaluate the performance (Continuous Internal Evaluation) for 50 Marks. The Report will be evaluated for 100 marks by both internal and external evaluators. Internal and external examiners for 100 marks will evaluate final viva-voce which includes demonstration and presentation of project work jointly.

**Guidelines for MOOC Elective:**

- Students can register for MOOC Elective anytime during 2<sup>nd</sup> /3<sup>rd</sup> Semester and credit transfer happens only during 4<sup>th</sup> Semester after submission of this Certificate.
- Students can opt for any one course either from odd semester or from even semester as offered by NPTEL in the respective semester. The subject will be approved by DC.
- The list of SWAYAM based online credit courses for the ensuing semester shall be notified on the SWAYAM platform before the 1<sup>st</sup> November for the January semester and before the 1<sup>st</sup> June for the July semester, every year.
- The Department Co-Ordinator shall incorporate the marks or grades obtained by the student in the marks sheet that counts for final processing of the equivalent grading as per the regulation for the PG Programme. Details are shown in the following tables

MOOC Course Duration	Credit Details
8 Weeks	2

**Guidelines for Equivalent Grading for PG programme:**

Levels	Outstanding	Excellent	Very Good	Good	Above Average	Poor	Fail
Score/ Marks in MOOC Course	(90-100)	(80-89)	(70-79)	(60-69)	(55-59)	(50-54)	(0-49)
Grade Point	10	09	08	07	06	04	0
Grade	S	A	B	C	D	E	F