



**RAMAIAH**  
Institute of Technology

# **CURRICULUM**

**for the Academic year 2019 – 2020**

**MASTER OF COMPUTER APPLICATIONS**

**V & VI SEMESTER MCA**

**RAMAIAH INSTITUTE OF TECHNOLOGY**  
(Autonomous Institute, Affiliated to VTU)  
Bangalore – 560054.

## **About the Institute**

Ramaiah Institute of Technology (RIT) (formerly known as M. S. Ramaiah Institute of Technology) is a self-financing institution established in Bangalore in the year 1962 by the industrialist and philanthropist, Late Dr. M S Ramaiah. The Institute is accredited with “A” grade by NAAC in 2014 and all engineering departments offering bachelor degree programs have been accredited by NBA. RIT is one of the few institutes with faculty student ratio of 1:15 and achieves excellent academic results. The institute is a participant of the Technical Education Quality Improvement Program (TEQIP), an initiative of the Government of India. All the departments are full with competent faculty, with 100% of them being postgraduates or doctorates. Some of the distinguished features of RIT are: State of the art laboratories, individual computing facility to all faculty members. All research departments are active with sponsored projects and more than 150 scholars are pursuing PhD. The Centre for Advanced Training and Continuing Education (CATCE), and Entrepreneurship Development Cell (EDC) have been set up on campus. RIT has a strong Placement and Training department with a committed team, a fully equipped Sports department, large air-conditioned library with over 1,35,427 books with subscription to more than 300 International and National Journals. The Digital Library subscribes to several online e-journals like IEEE, JET etc. RIT is a member of DELNET, and AICTE INDEST Consortium. RIT has a modern auditorium, several hi-tech conference halls, all air-conditioned with video conferencing facilities. It has excellent hostel facilities for boys and girls. RIT Alumni have distinguished themselves by occupying high positions in India and abroad and are in touch with the institute through an active Alumni Association. RIT obtained Academic Autonomy for all its UG and PG programs in the year 2007. As per the National Institutional Ranking Framework, MHRD, Government of India, Ramaiah Institute of Technology has achieved 60<sup>th</sup> rank among the top 100 engineering colleges across India.

## **About the Department**

The Department of Computer Applications was established in 1997 with the objective of producing high quality professionals to meet the demands of the emerging field of Computer Applications. The department got academic autonomy in the year 2007 and is accredited by NBA. The department is recognized as a Research Centre under Visvesvaraya Technological University in 2012.

## **VISION OF THE INSTITUTE**

To be an Institution of International Eminence, renowned for imparting quality technical education, cutting edge research and innovation to meet global socio economic needs

## **MISSION OF THE INSTITUTE**

MSRIT shall meet the global socio-economic needs through

1. Imparting quality technical education by nurturing a conducive learning environment through continuous improvement and customization
2. Establishing research clusters in emerging areas in collaboration with globally reputed organizations
3. Establishing innovative skills development, techno-entrepreneurial activities and consultancy for socio-economic needs

## **QUALITY POLICY**

We at M. S. Ramaiah Institute of Technology strive to deliver comprehensive, continually enhanced, global quality technical and management education through an established Quality Management System complemented by the synergistic interaction of the stake holders concerned

## **VISION OF THE DEPARTMENT**

To be a nationally prominent and internationally recognized department in academics and research activities with the aim of developing competitive software professionals to serve the society and ever changing industry.

## **MISSION OF THE DEPARTMENT**

1. To enable the students to be knowledgeable and creative through state-of-the-art curriculum and innovative teaching methodologies
2. To provide training programs that bridges the gap between academia and industry to produce competitive software professionals
3. To inculcate ethical values in the students enabling them to become socially committed professionals
4. To enhance the research quality and productivity, by providing required facilities

## **PROGRAM EDUCATIONAL OBJECTIVES (PEOs):**

**PEO1.** Excel in professional career in the field of Computer Applications and contribute to research and development activities.

**PEO2.** Provide software solutions that are socially acceptable and adapt emerging technologies and tools.

**PEO3.** Exhibit ethical and communication skills and engage in lifelong learning.

## **PROGRAM OUTCOMES (POs):**

- PO1:** Apply knowledge of mathematics and computing principles appropriately to develop conceptual model for real world problems.
- PO2:** Identify and formulate problem definition for real world problems, analyse the literature of the domain and provide solutions using mathematics and computing.
- PO3:** Design, develop and assess a software system, process, component, or program of varying complexity that meet specified needs with appropriate consideration for public health and safety and societal considerations.
- PO4:** Use research based knowledge to analyse and interpret data and synthesize information to provide valid conclusions.
- PO5:** Adapt to understand, select, use and create modern tools and technologies necessary for computing practices.
- PO6:** Adopt professional ethics, principles of professional computing practices, cyber regulations and responsibilities.
- PO7:** Recognize the need and engage in self-learning for continual development as a computing professional.
- PO8:** Apply the management principles for managing projects as an individual, as a member and as a leader in a team under multidisciplinary environments.
- PO9:** Communicate effectively about computing activities in both verbal and written form with the computing community and with society.
- PO10:** Assess the local and global impact of software solutions on individuals, organizations and society.
- PO11:** Perform effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.
- PO12:** Adopt standardized software engineering practices with innovative ideas to succeed as an employee or entrepreneur.

## Curriculum Course Credits Distribution

Semester	Mathematics (MTH)	Management (MGT)	Humanities & Social Sciences (HSS)	Professional Courses		Project Work / Internship (PW /IN)	Seminar (SEM)	Self-Study (SS)	Total credits in a semester
				Core (Hard core, Soft core, Lab) (PC- C)	Electives (PC-E)				
<b>First</b>			4	21				2	25
<b>Second</b>	4	4		17					25
<b>Third</b>				16	8		1		25
<b>Fourth</b>				12	12	2			26
<b>Fifth</b>				12	12				24
<b>Sixth</b>						23			23
<b>Total</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>78</b>	<b>32</b>	<b>25</b>	<b>1</b>	<b>2</b>	<b>150</b>

## SCHEME FOR 2017-2020 BATCH

### I SEMESTER

S. No	Course Code	Title of the Course	Credits*				
			L	T	P	S	Total
1	MCA11	Problem Solving Using 'C'	3	1	1	0	5
2	MCA12 <sup>#</sup>	Data Analysis using Spread Sheets	0	1	2	1	4
3	MCA13	Fundamentals of Computer Organization	4	0	0	0	4
4	MCA14	Introduction to UNIX	3	0	1	0	4
5	MCA15	Professional Communication and Ethics	3	1	0	0	4
6	MCA16	Introduction to Web Programming	3	0	1	0	4
<b>Total</b>			<b>16</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>25</b>

### II SEMESTER

S. No	Course Code	Title of the Course	Credits*				
			L	T	P	S	Total
1	MCA21	Object Oriented Programming with C++	3	1	1	0	5
2	MCA22	Discrete Mathematics	3	1	0	0	4
3	MCA23	Database Management Systems	3	0	1	0	4
4	MCA24	Data Structures Using 'C'	3	0	1	0	4
5	MCA25	Management Information Systems	4	0	0	0	4
6	MCA26 <sup>#</sup>	Interactive Web Programming	0	1	2	1	4
<b>Total</b>			<b>15</b>	<b>3</b>	<b>6</b>	<b>1</b>	<b>25</b>

### III SEMESTER

S. No	Course Code	Course	Credits*				
			L	T	P	S	Total
1	MCA31	Operating Systems	4	0	0	0	4
2	MCA32	Design and Analysis of Algorithms	3	0	1	0	4
3	MCA33	Software Engineering	4	0	0	0	4
4	MCA34	Predictive Analytics	3	0	1	0	4
5	MCAE--	Elective I					4
6	MCAE--	Elective II					4
7	MCAS1	Seminar					1
<b>Total</b>							<b>25</b>

**#Semester End Examination will be conducted for Laboratory**

**\* L: Lecture    T: Tutorial    P: Practical    S: Self Study**

### IV SEMESTER

S. No	Course Code	Course	Credits*					
			L	T	P	S	Total	
1	MCA41	Computer Networks	3	0	1	0	4	
2	MCA42	Object Oriented Modeling and Design Patterns	3	0	1	0	4	
3	MCA43	UNIX Systems Programming	3	0	1	0	4	
4	MCAE--	Elective III						4
5	MCAE--	Elective IV						4
6	MCAE--	Elective V						4
7	MCAP1 <sup>#</sup>	Mini Project	0	0	1	1	2	
<b>Total</b>								<b>26</b>

### V SEMESTER

S. No	Course Code	Course	Credits*					
			L	T	P	S	Total	
1	MCA51 <sup>#</sup>	Mobile Application Development	0	1	2	1	4	
2	MCA52	Information Security	3	0	1	0	4	
3	MCASC-	Softcore Course	4	0	0	0	4	
4	MCAE--	Elective VI						4
5	MCAE--	Elective VII						4
6	MCAE--	Elective VIII						4
<b>Total</b>								<b>24</b>

### SOFTCORE COURSES

S. No	Course Code	Course	Credits*				
			L	T	P	S	Total
1	MCASC1	Supply Chain Management	4	0	0	0	4
2	MCASC2	Software Project Management	4	0	0	0	4
3	MCASC3	Enterprise Resource Planning	4	0	0	0	4

### VI SEMESTER MASTER OF COMPUTER APPLICATIONS

S. No	Course Code	Course	Credits*				
			L	T	P	Total	
1.	MCA61	Project Work					23
<b>Total</b>							<b>23</b>

**#Semester End Examination will be conducted for Laboratory**  
**\* L: Lecture    T: Tutorial    P: Practical    S: Self Study**

**Students have to acquire 2 credits by accomplishing any one of the following as a self-study component within the duration of the Programme (MCASS1):**

- On-line Certification Course
- Internship of 8-weeks followed by a report
- Paper Publication in International Conference along with a report and presentation
- Clearing one level in any of the recognized competitions



## ELECTIVE COURSES

S. No	Course Code	Course Name	Pre-requisite Course(s)	Credits*				
				L	T	P	S	Total
1	MCAE01	Programming in Java	MCA21	3	0	1	0	4
2	MCAE02	Operations Research		3	1	0	0	4
3	MCAE03	Machine Learning	MCA12, MCA21	3	0	1	0	4
4	MCAE04 <sup>#</sup>	Web Programming with PHP and AJAX	MCA26	0	1	2	1	4
5	MCAE05 <sup>#</sup>	Computer Graphics and Animation		0	1	2	1	4
6	MCAE06	Secure Coding in C and C++	MCA21	3	0	1	0	4
7	MCAE07 <sup>#</sup>	NoSQL Databases	MCA23	0	1	2	1	4
8	MCAE08	Programming with Python	MCA11 MCA26	3	0	1	0	4
9	MCAE09 <sup>#</sup>	Web Component Development with J2EE	MCAE01	0	1	2	1	4
10	MCAE10	Programming with C#.Net	MCA21	2	0	2	0	4
11	MCAE11	Digital Forensics		2	0	2	0	4
12	MCAE12	System Modeling and Simulation		3	0	1	0	4
13	MCAE13 <sup>#</sup>	Cloud Computing	MCA31, MCA41	0	1	2	1	4
14	MCAE14	Software Testing	MCA33	3	0	1	0	4
15	MCAE15 <sup>#</sup>	Programming IoT	MCAE08	0	1	2	1	4
16	MCAE16 <sup>#</sup>	ASP.Net with C#	MCA21, MCA26	0	1	2	1	4

**#Semester End Examination will be conducted for Laboratory**

**\* L: Lecture      T: Tutorial P: Practical S: Self Study**

# Mobile Application Development

**Course Code: MCA51**

**Credits: 0:1:2:1**

**Prerequisite: Nil**

**Contact Hours: 28T 56P 28S**

**Course Coordinator: Dr. Manish Kumar**

## Topics to be Covered in Tutorial:

- Introduction to android, features, Android Architecture
- Exploring linear layout and Relative layout
- Exploring widgets
- Android activity life cycle
- Intents in Android, Shared preferences
- Fragments in android
- Animations
- Databases and content providers
- Services
- Sensors and location based services
- Audio playback and image capture
- Introduction to frameworks (Cordova, Phonegap)

## Laboratory:

- Programs supplement the tutorial concepts will be based on the latest version of Android SDK.
- Mini Project

## Text Books:

1. Reto Meier: Professional Android 4 Application Development. Wiley India Edition, 2012.

## Reference Books:

1. Jerome (J.F.) Di Marzio: Android A Programmer's Guide, Tata McGraw-Hill, 2010.
2. B.M. Harwani: Android Programming, Pearson, 2013.
3. Jason Ostrander: Android UI Fundamentals Develop and Design, Pearson, 2014.
4. John Horton: Android Programming for Beginners, Packt publishing, 2015.
5. Nanjesh Bennur, Deepesh R, Dr. Niranjanamurthy M Fundamentals of Mobile Application Development First Edition, InSc Publishing house, 2019.
6. **Web Reference:** Any Google developer sites

**Course Outcomes (COs):**

1. Describe the Android SDK, Development Framework and Demonstrate Android Application Life Cycle. (PO-1,2,3,5)
2. Apply the Android UI and animations API for enhancing the user experience and developing advanced applications. (PO - 1,2,3,5,7,10,11)
3. Handle sensors and location based services for real world Apps development. (PO - 1,2,3,5,7,10,11)
4. Develop the Android Applications Using Databases and Background Services. (PO - 1,2,3,5,7,10,11,12)

# Information Security

**Subject Code: MCA52**

**Prerequisite: Nil**

**Course Coordinator: Chethan Venkatesh**

**Credits: 3:0:1:0**

**Contact Hours: 42L 14P**

## UNIT I

**Introduction to Information Security:** What Is Security? Components of an Information System, Balancing Information Security and Access, Approaches to Information Security Implementation, The Security Systems Development Life Cycle, **The Need for Security:** Threats, Attacks, **Legal, Ethical, and Professional Issues in Information Security:** Ethics and Information Security, Codes of Ethics and Professional Organizations.

## UNIT II

**Risk Management:** Risk Identification, Risk Assessment, Risk Control Strategies, selecting a Risk Control Strategy, Quantitative Versus Qualitative Risk Control Practices, **Security Technology: Firewalls and VPNs,** Access Control, Firewalls, Protecting Remote Connections.

## UNIT III

**Security Technology: Intrusion Detection and Prevention Systems, and Other Security Tools,** Intrusion Detection and Prevention Systems, Honeypots, Honeynets, and Padded Cell Systems, Scanning and Analysis Tools, Biometric Access Controls **Implementing Information Security,** Information Security Project Management, Technical Aspects of Implementation, Nontechnical Aspects of Implementation.

## UNIT IV

**Symmetric Ciphers:** Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography, **Block Ciphers and the Data Encryption Standard:** Block Cipher Principles, The Data Encryption Standard, The Strength of Des, **Advanced Encryption Standard,** Evaluation Criteria For AES, The AES Cipher.

## UNIT V

**Public-Key Encryption and Hash Functions, Public-Key Cryptography and RSA,** Principles of Public-Key Cryptosystems The RSA Algorithm, **Key Management; Other Public-Key Cryptosystems,** Key Management, Diffie-Hellman Key Exchange, **Message Authentication and Hash Functions,** Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Security of Hash Functions and Macs.

**Text Books:**

1. Michael E. Whitman, Herbert J. Mattord: Principles of Information Security, 4th Edition, Cengage Learning, 2012. (Selected Portion from Chapters 1,2,3,4,5,6,7,9,10).
2. William Stallings: Cryptography and Network Security-Principles and Practices, 4th Edition, Prentice Hall, (Chapters 2.1 to 2.5, 3.1 to 3.3, 3.5, 5.1 to 5.2, 9.1 to 9.2, 10.1 to 10.2, 11.1 to 11.5).

**Reference Books:**

1. Behrouz A Forouzan: Cryptography & Network Security, 3rd Edition, 2015, Tata McGraw Hill.
2. R. Kelly Rainer, Casey G. Cegielski: Introduction to Information Systems, 4ed, Wiley India.
3. Mark Merkow, James Breithaupt: Information Security: Principles and Practices, Pearson Education.

**Course Outcomes (COs):**

1. Describe the basic concepts of information security, its need, legal, ethical and professional issues associated with it. (PO-1, 6)
2. Identify risks and its controlling mechanisms, importance of firewalls and VPN in the context of network security. (PO-1, 5)
3. Discuss different security technologies and implementation of information security. (PO-1, 3, 5)
4. Apply symmetric key cryptography and encryption standards. (PO-1, 3, 5)
5. Explain public-key cryptography and hash functions. (PO-1, 3, 5)

# Software Project Management

**Subject Code: MCASC2**

**Prerequisite: Nil**

**Course Coordinator: Dr.D.Evangelin Geetha**

**Credits: 4:0:0:0**

**Contact Hours: 56L**

## UNIT I

**PROJECT EVALUATION AND PROJECT PLANNING:** Importance of Software Project Management, Activities Methodologies, Categorization of Software Projects, Setting objectives, Management Principles, Management Control, Project portfolio Management, Cost-benefit evaluation technology, Risk evaluation, Strategic program Management, Stepwise Project Planning.

## UNIT II

**PROJECT LIFE CYCLE AND EFFORT ESTIMATION:** Software process and Process Models, Choice of Process models, mental delivery, Rapid Application development, Agile methods, Extreme Programming, SCRUM, managing interactive processes, Basics of Software estimation, Effort and Cost estimation techniques, COSMIC Full function points, COCOMO II A Parametric Productivity Model, Staffing Pattern.

## UNIT III

**ACTIVITY PLANNING AND RISK MANAGEMENT:** Objectives of Activity planning, Project schedules, Activities, Sequencing and scheduling, Network Planning models, Forward Pass & Backward Pass techniques, Critical path (CRM) method, Risk identification, Assessment, Monitoring, PERT technique, Monte Carlo simulation, Resource Allocation, Creation of critical patterns, Cost schedules.

## UNIT IV

**PROJECT MANAGEMENT AND CONTROL** Framework for Management and control, Collection of data Project termination, visualizing progress, Cost monitoring, Earned Value Analysis- Project tracking, Change control- Software Configuration Management, Managing contracts, Contract Management.

## UNIT V

**STAFFING IN SOFTWARE PROJECTS:** Managing people, Organizational behavior, Best methods of staff selection, Motivation, The Oldham-Hackman job characteristic model, Ethical and Programmed concerns, working in teams, Decision making, Team structures, Virtual teams, Communications genres, Communication plans.

**Text Books:**

1. Bob Hughes, Mike Cotterell and Rajib Mall, Software Project Management, 5<sup>th</sup> Edition, Tata McGraw Hill, New Delhi, 2012.

**Reference Books:**

1. Robert K. Wysocki, Effective Software Project Management, Wiley Publication, 2011.
2. Walker Royce, Software Project Management, Addison-Wesley, 1998.
3. Gopaldaswamy Ramesh, Managing Global Software Projects, McGraw Hill Education (India), Fourteenth Reprint, 2013.

**Course Outcomes (COs):**

1. Discuss the software project evaluation and project planning (PO-2,3,8)
2. Describe the software project life cycle and apply the software effort estimation techniques (PO-1,4,8)
3. Plan the software activities and manage the risks (PO-2,4)
4. Handle the framework for software project management and managing the change control (PO-2,4)
5. Manage the staffing in software projects (PO-8,9,11)

# Machine Learning

**Course Code: MCAE03**

**Credits: 3:0:1:0**

**Prerequisites: MCA12, MCA21**

**Contact Hours: 42L 28P**

**Course Coordinator: Sailaja Kumar**

## UNIT I

Introduction: Basic Definitions, Types of Learning, Hypothesis Space and Inductive Bias, Evaluation, Cross-Validation.

## UNIT II

Linear Regression: Introduction to Decision Trees, Learning Decision Trees, Over-Fitting.

## UNIT III

Support Vector Machine, Kernel Function and Kernel SVM.

## UNIT IV

Neural Network: Perceptron, Multilayer Network, Back Propagation; Computational Learning Theory, PAC Learning Model, Sample complexity, VC Dimension, Ensemble learning: Boosting and Bagging.

## UNIT V

Clustering: K-Means, Adaptive Hierarchical Clustering, Gaussian Mixture Model.

### Laboratory:

Programs that supplement the theory concepts are to be implemented.

### Reference Books:

1. Tom Mitchell, Machine Learning, 1st Edition, McGraw- Hill, 1997.
2. Ethem Alpaydin, Introduction to Machine Learning, 2nd Edition, The MIT Press Cambridge, Massachusetts London, England, 2010
3. Sebastian Raschka, Python Machine learning, Packt Publishing Ltd., 2015

### Course Outcomes (COs):

1. Distinguish between, supervised, unsupervised and semi-supervised learning. (PO – 1,2,4)
2. Apply the supervised machine learning algorithms for any given problem. (PO-1,4,5)
3. Analyze the usage of SVMs in solving problems (PO-1,4,5)
4. Demonstrate the dimensionality reduction techniques (PO-1,4,5)
5. Design applications that uses the appropriate graph models of machine learning. (PO-1,4,5)



# Cloud Computing

**Course code: MCAE13**

**Prerequisites: MCA31, MCA41**

**Course Coordinator: Dr.S.Jagannatha**

**Credits: 0:1:2:1**

**Contact Hours:28T 56P 28S**

## **Concepts to be covered in Tutorial**

- Introduction to Cloud Computing
- Comparison of SaaS, PaaS, IaaS in detail.
- Familiarity of different services provided by AWS
- Working with Amazon EC2, and S3 services
- Back up and Launch a new instance using Back-up.
- Elastic IPs and AWS Identity and Access Management(IAM).
- Hosting Static Website and Hosting Applications in AWS
- Working with AWS RDS: MySQL Workbench and Dynamo DB
- Resource management in cloud: Load Balancer and Auto Scaling Group
- AWS-Eclipse Integration
- Connect RDS and Java Applications

## **Exercises for Laboratory:**

- Familiarize the services by AWS
- Creating user login
- Creating Linux, Windows virtual machines instance using EC2
- Run simple applications on EC2 Instance
- Creating Storage using S3
- Create a Backup using Image and launch new instance using Backup image
- Creating an RDS Instance with MySQL Workbench and Dynamo DB
- Demonstrate Database application on AWS
- Upgrading and downgrading the infrastructure based on the requirement
- Demonstrate Load balancing using different instance of EC2
- Launch a web application.
- Demonstration of Identity and Access management.
- Demonstrate Elastic bean stack
- Demonstrate AWS dynamic web application.

## **Self-study:**

### **Sample topics for self-study**

- Comparison of different Cloud Platforms.
- Demonstrate RDS server using Dynamo Db and Oracle Database server
- Demonstrate and Explain the applications and services of Amazon Alexa for Voice user Interface in Education
- Migrating web application in AWS

## **References:**

1. Rajkumar Buyya, ChristaianVecchiola, S. ThamaraiSelvi, Master Cloud Computing, TMH Education, 2013.
2. ArshdeepBahga, Vijay Madiseti, Cloud Computing: A Hands-on Approach, Universities Press, 2014.
3. [https://aws.amazon.com/training/intro\\_series/](https://aws.amazon.com/training/intro_series/)
4. <https://aws.amazon.com/getting-started/>
5. <https://aws.amazon.com/>
6. <https://aws.amazon.com/free/>
7. <https://blog.webspecia.com/cloud/iaas-paas-saas-explained-examples-comparison>
8. <http://aws.amazon.com/training/self-paced-labs/>
9. Instructor led AWS Training - <http://aws.amazon.com/training/>

## **Course Outcomes (COs):**

1. Create EC2 Instances, S3, Image, Recovery and run simple application on AWS Cloud. (PO - 1,3,5,7,9,10)
2. Demonstrate by creating RDS, Auto scaling, Load balancer and IAM on AWS. (PO - 1,3,5,7,9,10)
3. Develop AWS Dynamic Web Application and Migration Applications on AWS. (PO - 1,3,5,7,9,10)

# Programming IoT

**Course Code: MCAE15**

**Prerequisite: MCAE08**

**Course Coordinator: Dr.S.Jagannatha**

**Credits: 0:1:2:1**

**Contact Hours: 28T 56P 28S**

## Concepts to be covered in Tutorial

- Introduction to Internet of Things (IoT)
- IoT enabling technologies and IoT levels
- Python Programming with Raspberry Pi
- Working with Arduino
- Working with Sensors on Raspberry Pi and Arduino
- Case study on Home Intrusion Detection
- Introducing Cloud platform for IoT

## Exercises for Lab

- Familiarity with Raspberry Pi
- Exploring the different components of Raspberry pi
- Setting up of the board and booting the board
- Practice sessions on Python with Django
- Working with different sensors on Raspberry Pi
- Sample application development using Raspberry Pi and Python
- Familiarity with Arduino
- Exploring the different components of Arduino
- Setting up of the board and booting the board
- Working with different sensors on Arduino
- Designing Home Intrusion Detection System
- Configuring and setting up the board for Home Intrusion Detection
- Programming Home Intrusion Detection
- Project Work

## Self-study

### Sample topics for self-study

- **Evaluation-1**
  - Basics of Electronics
- **Evaluation-2**
  - Communication between different IoT boards using RF/Bluetooth/Wifi
- **Evaluation-3**
  - Demo of Cloud platform for IoT

## References

1. Arshdeep Bahga, Vijay Madisetti: Internet of Things: A Hands on Approach, Universities Press, 2015
2. Simon Monk: Programming the RaspberryPi: Getting Started with Python, McGrawHill, 2<sup>nd</sup> Ed, 2015
3. Simon Monk: Raspberry Pi Cookbook, May 2016, O'Reilly
4. [www.raspberrypi.org](http://www.raspberrypi.org)
5. <http://forefront.io/a/beginners-guide-to-arduino/>
6. <https://www.arduino.cc/en/Tutorial/HomePage>

## Course Outcomes (COs):

1. Configure the Raspberry Pi board for a given application.  
(PO - 1,2,3,4,5,7,8,9,10,11)
2. Design Arduino board to communicate with sensors.  
(PO - 1,2,3,4,5,7,8,9,10,11,12)
3. Develop applications using Raspberry Pi and Arduino.  
(PO - 1,2,3,4,5,7,8,9,10,12)

## ASP.Net with C#

**Course Code: MCAE16**

**Prerequisite: MCA26**

**Course Coordinator: Madhu Bhan**

**Credits: 0:1:2:1**

**Contact Hours: 28T 56P 28S**

### Course Contents:

- Introduction to ASP.Net
- ASP.Net development environment
- Creating a Simple Application
- Standard Web Controls in ASP.Net
- Event Handling in ASP.Net
- Validation Controls in ASP.Net
- ADO.Net and Data Binding

Note: C# concepts to be covered where ever it is required to implement the business logic

### Self-study Topics include but not limited to

- Basics of C#
- Rich Data Controls in ASP.Net
- LINQ in ASP.Net

### Reference Books:

1. Kogent Learning Solutions Inc.: ASP.NET 4.5, Covers C# and VB Codes, Black Book, Dreamtech Press, 2013.
2. Joseph Albahari, Ben Albahari: C# 6.0 Pocket Reference, Shroff Publishers & Distributers Private Limited, 2015.
3. Andrew Troelsen, Philip Japikse: C# 6.0 and the .NET 4.6 Framework, Apress, 7<sup>th</sup> Edition, 2015.

### Course Outcomes (COs):

Design and Develop Web Applications using ASP.Net and C#. (PO-2, 3, 5)

## **VI SEMESTER**

## **PROJECT WORK**

**Course Code: MCA61**

**Credits: 23**

### **DISSERTATION WORK GUIDELINES**

- The topic and title of the dissertation shall be chosen by the candidate in consultation with the guide and co-guide. However, modification of the title is permitted at the time of submission of dissertation report. The subject and topic of dissertation shall be from the major field of studies of the candidate.
- The dissertation work shall be carried out by each candidate independently under the guidance of one of the faculty members of the Department.
- If dissertation has to be carried out in any industry/factory/organization, outside the campus, the permission to that effect and the name of co-guide at any of these organizations shall be intimated to the Head of the Department.
- At the end of the semester each candidate shall submit a report of the dissertation work duly approved by the guide. The dissertation work shall be countersigned by the co-guide (if any) and Head of the Department.
- The candidate shall submit Two copies of the dissertation work to the Head of the Department. Duration of the dissertation work shall be 5 months. A separate calendar of events for submission of dissertation and viva-voce shall be fixed and will be notified by the Chairman of Board of Exam (BoE).The candidates who fail to submit the dissertation work within the stipulated time have to submit the same at the time of next ensuing examination.
- The dissertation shall be evaluated by two examiners-one internal and one external, appointed by the Chairman of BoE. The evaluation of the dissertation shall be made independently by each examiner. During the evaluation of the dissertation if anyone of the examiner/both/feels that the candidate is not getting the minimum marks for passing, he/they shall notify to the Chairman of BoE stating specific reasons for rejection and suggestions for resubmission. The viva-voce examination of such candidates shall not be conducted. The resubmitted dissertation may preferably send to the same examiners for the re-examination.

- The candidate may also choose another topic of dissertation under a new guide, if necessary. In such case dissertation may be submitted within 6 years from the date of admission to the course. A different set of examiners shall be constituted for evaluation of dissertation under such circumstances by the Chairman of BoE.
- A copy of the dissertation shall be sent to both the examiners by the Chairman of BoE.
- Both the examiners shall evaluate the dissertation normally within a period of not more than 3 weeks from the date of receipt of the dissertation. The external examiner shall be contacted by the head of the department to arrive at a convenient date for the conduct of viva-voce of the batch students allotted to the external examiner.
- The relative weightage for the evaluation of dissertation and the performance of the viva-voce shall be as per the scheme.
- Both the examiners shall evaluate the dissertation independently and marks shall be awarded jointly at the time of viva-voce examination.
- The viva-voce examination will be conducted jointly by the internal and external examiners and marks shall be awarded jointly. The marks shall be sent to the Controller of Examinations immediately after examination.

**Note:** All the above guidelines are subjected to the approval by the Chairman of Board of Studies, from time to time.



## Self-Study Course

**Course Code: MCASS1**

**Credits: 0:0:0:2**

### **Guidelines:**

- Students have to acquire 2 credits by accomplishing any one of the following as a self-study component within the duration of the Programme:
  - On-line Certification Course
  - Internship of 8-weeks followed by a report
  - Paper Publication in International Conference along with a report and presentation
  - Clearing one level in any of the recognized competitions
- On-line Certification Course
  - Students can register for any On-line Certification Course in the field of Computer Science/Management for a minimum duration of 8 weeks
  - They have to submit the Course Completion Certificate along with their scores
- Internship of 8-weeks followed by a report
  - Students have to undergo the Internship in any Institute of National repute or any reputed/well-known industry
  - They are expected to submit a report and give a presentation
- Paper Publication in International Conference along with a report and presentation
  - Students have to publish a research paper in a peer-reviewed International Conference.
  - After the conference, he/she has to submit a report and give a presentation
- Clearing one level in any of the recognized competitions
  - Students have to register for any recognized competitions and clear one level
  - The committee has to identify suitable competition and make the students to aware of that

### **Approval and Evaluation Process:**

- Approval and evaluation can be done by the committee along with the concerned proctor
- The students have to get prior approval from the committee to take up the activity
- A stipulated period can be provided for the approval and evaluation process

## Survey Form

### To be responded by the Students of the Department

Please respond to the following items keeping in mind your need to acquire Application Development and Management capabilities and skills as against those being offered by the Post Graduate Programme at the Department of Computer Applications at MSRIT, Bangalore. You may use **tick mark** to indicate your response/Impression.

Sl. No.	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The Programme helped me develop the skills to apply knowledge of Mathematics while modeling software applications.					
2.	After undergoing the Programme I am able to apply knowledge of computing while modeling software applications.					
3.	I am now able to apply knowledge of management principles while modeling software applications.					
4.	The programme lab has enabled me to identify, formulate, analyze literature and provide software solutions to real life computing problems					
5.	The programme has enlightened me about the various techniques needed to write Research Papers/ Paper Presentations/ White Papers etc.					
6.	I am now able to analyze problems, design and develop solutions.					
7.	The Programme has helped me understand the computing and management principles needed to manage projects as an individual.					
8.	The Programme helped me understand the computing and management principles needed to manage projects as a member in a team.					

9.	After the graduation now I am confidently able to apply the computing and management principles to manage projects in multidisciplinary environments.					
10.	The programme has convinced me to adopt current technologies necessary for computing practices.					
11.	The programme taught me to create/use modern tools necessary for computing practices.					
12.	I am being well enlightened about my professional and ethical responsibilities					
13.	I know and am able to follow the cyber regulations.					
14	My Communication Skills both in verbal and written form were refined by the Programme.					
15	The programme helped me to analyze the local and global impact of software solutions on individuals, organizations and society.					
16	I am now capable to engage myself in self-learning for continual development as a computing professional.					
17	The programme helped me to adopt standardized software engineering practices.					

**Any other Comments:**

**Name of Respondent:**

**Affiliation:**

Thank you for taking time to complete the questionnaire. Your opinions would be invaluable in improving the quality of our post graduate Programme. Your views will be duly considered.