



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**  
**CHOICE BASED CREDIT SYSTEM (CBCS)**  
**SCHEME OF TEACHING AND EXAMINATION 2016 – 17 Onwards**  
 Master of Computer Applications (MCA)

<b>I Semester</b>								
<b>Subject Code</b>	<b>Name of the Subject</b>	<b>Teaching hours/week</b>		<b>Duration of Exam in Hours</b>	<b>Marks for</b>		<b>Total Marks</b>	<b>CREDITS</b>
		<b>Lecture</b>	<b>Practical / Assignment</b>		<b>CIE</b>	<b>SEE</b>		
16MCA11	Data structures using C	4	--	3	20	80	100	4
16MCA12	Unix Programming	4	--	3	20	80	100	4
16MCA13	Web Technologies	4	--	3	20	80	100	4
16MCA14	Computer Organization	4	--	3	20	80	100	4
16MCA15	Discrete Mathematical Structures	4	--	3	20	80	100	4
16MCA16	Data structures using CLaboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA17	UnixProgramming Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA18	Web ProgrammingLaboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
<b>Total</b>		<b>20</b>	<b>09</b>	<b>24</b>	<b>160</b>	<b>640</b>	<b>800</b>	<b>26</b>



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<b>II Semester</b>		<b>CREDIT BASED</b>						
<b>Subject Code</b>	<b>Name of the Subject</b>	<b>Teaching hours/week</b>		<b>Duration of Exam in Hours</b>	<b>Marks for</b>		<b>Total Marks</b>	<b>CREDITS</b>
		<b>Lecture</b>	<b>Practical / Assignment</b>		<b>CIE</b>	<b>SEE</b>		
16MCA21	Python Programming	4	--	3	20	80	100	4
16MCA22	Object oriented programming using C++	4	--	3	20	80	100	4
16MCA23	Database Management Systems	4	--	3	20	80	100	4
16MCA24	Operating Systems	4	--	3	20	80	100	4
16MCA25	System Software	4	--	3	20	80	100	4
16MCA26	Python Programming Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA27	Object oriented programming using C++ laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA28	DBMS Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
<b>Total</b>		<b>20</b>	<b>09</b>	<b>24</b>	<b>160</b>	<b>640</b>	<b>800</b>	<b>26</b>



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<b>III Semester</b>		<b>CREDIT BASED</b>						
<b>Subject Code</b>	<b>Name of the Subject</b>	<b>Teaching hours/week</b>		<b>Duration of Exam in Hours</b>	<b>Marks for</b>		<b>Total Marks</b>	<b>CREDITS</b>
		<b>Lecture</b>	<b>Practical / Assignment</b>		<b>CIE</b>	<b>SEE</b>		
16MCA31	Computer Networks	4	--	3	20	80	100	4
16MCA32	Java Programming	4	--	3	20	80	100	4
16MCA33	Analysis and Design of Algorithms	4	--	3	20	80	100	4
16MCA34	Software Engineering	4	--	3	20	80	100	4
16MCA35	Elective 1	3	--	3	20	80	100	3
16MCA36	Computer Networks Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA37	Java Programming Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA38	Analysis and Design of Algorithms Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
<b>Total</b>		<b>19</b>	<b>09</b>	<b>24</b>	<b>160</b>	<b>640</b>	<b>800</b>	<b>25</b>
<b>Elective- 1</b>								
16MCA351	Intellectual Property Rights							
16MCA352	Enterprise Resource Planning(ERP)							
16MCA353	MIS & E-Commerce							
16MCA354	Cyber Security							



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IV Semester				CREDIT BASED				
Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks	CREDIT S
		Lecture	Practical / Assignment		CIE	SEE		
16MCA41	Advanced Java Programming	4	--	3	20	80	100	4
16MCA42	Advanced Web Programming	4	--	3	20	80	100	4
16MCA43	Software Testing and Practices	4	--	3	20	80	100	4
16MCA44	Elective-2	3	--	3	20	80	100	3
16MCA45	Elective-3	3	--	3	20	80	100	3
16MCA46	Advanced Java Programming Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA47	Advanced Web Programming Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA48	Software Testing Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA49	Seminar	--	2	--	50	--	50	1
<b>Total</b>		<b>18</b>	<b>11</b>	<b>24</b>	<b>210</b>	<b>640</b>	<b>850</b>	<b>25</b>
<b>Elective -2</b>				<b>Elective-3</b>				
16MCA441	Advanced Computer Networks		16MCA451		Wireless Communication and Mobile Technologies			
16MCA442	Data Warehousing and Data Mining		16MCA452		Big Data Analytics			
16MCA443	Software Architecture		16MCA453		Software Quality			



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16MCA444	Cryptography and Network security	16MCA454	Management Principles of User Interface Design
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V Semester		CREDIT BASED						
Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Practical / Assignment		CIE	SEE		
16MCA51	Object-Oriented Modeling and Design Patterns	4	--	3	20	80	100	4
16MCA52	Programming Using C# & .NET	4	--	3	20	80	100	4
16MCA53	Mobile Applications	4	--	3	20	80	100	4
16MCA54	Elective-4	3	--	3	20	80	100	3
16MCA55	Elective-5	3	--	3	20	80	100	3
16MCA56	Software Design Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA57	.Net Laboratory	--	3(2 hrs lab+ 1 hr instruction)	3	20	80	100	2
16MCA58	Mini Project : Mobile Applications Development using Android/iOS/Windows etc.	--	4(2 hrs lab+ 1 hr instruction+ 1 hr contact)	3	20	80	100	3
16MCA59	Seminar	--	2	--	50	--	50	1
<b>Total</b>		<b>18</b>	<b>12</b>	<b>24</b>	<b>210</b>	<b>640</b>	<b>850</b>	<b>26</b>
<b>Elective-4</b>				<b>Elective-5</b>				
16MCA541	Web2.0 and Rich Internet Applications			16MCA551	Software Defined Networks			
16MCA542	Cloud Computing			16MCA552	Internet of Things(IoT)			
16MCA543	Artificial Intelligence			16MCA553	Service Oriented Architecture			
16MCA544	Storage Area Networks			16MCA554	Software Project Management			

**16MCA49 and 16MCA59: Seminar**

- Students should present the seminar on cutting edge/emerging/state of the art technologies in the field of Computer Science and Applications.



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- Duration of the seminar should be approximately 45 minutes.
- Student should submit the write up on seminar topic containing at least 10 pages.



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<b>VI Semester</b>		<b>CREDIT BASED</b>					
Subject Code	Name of the Subject	Evaluation				Total	Credits
		Internal		External			
		Presentation	Report Evaluation	Dissertation Evaluation	Viva		
16MCA61	Internship	50	50	-	-	100	02
16MCA62	Project Work	75		125	100	300	20
<b>Total</b>		<b>175</b>		<b>125</b>	<b>100</b>	<b>400</b>	<b>22</b>

**Grand Total (I to VI Semesters): 4500 Marks : 150 Credits**

**Guidelines:**

**16MCA61: Internship**

- The students shall undergo internship for 6 weeks during the vacation immediately after the 5<sup>th</sup> 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 50 marks each.

**16MCA62: Project Work**

**Synopsis**

- Synopsis of the project must be submitted before the end of the first month of 6<sup>th</sup> 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 20 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 55 marks.
  - a) 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)
  - b) Final presentation for the entire project is evaluated for 25 marks.
- The internal examiners (Project Guide with at least 2 years experience) and the external examiners shall be appointed by the University for the final evaluation of the project.
- Internal and external examiners shall carry out the evaluation of Dissertation report for 125 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.