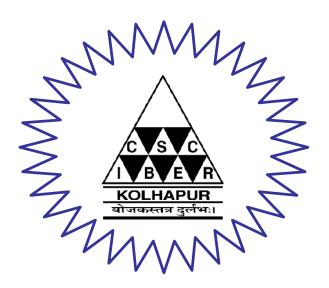# CHHATRAPATI SHAHU INSTITUTE OF BUSINESS EDUCATION & RESEARCH KOLHAPUR

(An Autonomous Institute under UGC Act)

DEPARTMENT OF COMPUTER STUDIES

STRUCTURE AND SYLLABUS OF

MASTER OF COMPUTER APPLICATION (MCA)
Program under the Faculty of Science

(Revised and Effective from 2021-22C.B.C.S. Pattern)

INTRODUCTION:

The M.C.A. programme is of two-year duration, named as M.C.A. (Part-I), M.C.A. (Part-II), in Faculty of Science. Each year is divided into two semesters for the convenience of teaching and examination. In each semester, there will be teaching for 15 weeks followed by an End-of-Semester (EOS) examination. The teaching for Semesters -I, III will be held between 1st July and 31st October, and the teaching for Semesters-II and IV will be held between 1st December and 31st March.

The students are supposed to undergo summer Internship in organization for 60 days After Semester-II and before Semester-III, they are supposed to submit a report about the same along with organizational certificate. Also they are supposed to present the same in semester-III end semester examination.

ELIGIBILITY:

1. A candidate for being eligible for admission to MCA programme (Faculty of Science) must have passed Bachelors Degree Examination of the Shivaji University or any other University recognized by A.I.U. (Association of Indian Universities) with minimum of *aggregate 50% marks for open category and 45% for Reserve category.*
2. Having studied Mathematics at 12th examination or having studied Mathematics as one of the subject at graduation level examination.
3. The candidates who have completed B.C.A. are also eligible.
4. In order to become eligible for admission to MCA programme, the candidate has undergo the process prescribed by DTE-Maharashtra from time to time.

DURATION:

The MCA shall be full time programme and its duration shall be of **Two Years**. The programme consists of Four Semesters. The examination to be held in the First and Second Semester will be called Part – I (First Year), the examination to be held in the Third and Fourth Semester will be called Part – II (Second Year) .

If a candidate fails to clear all the heads of passing (theory papers, practical, term papers and project work etc) within **Six** years of his/her registration, the past performance will stand automatically nullified.

If a candidate discontinues any of the terms (i.e. Semester – I to IV) on any account, will be allowed to complete the incompleted terms in the subsequent years subject to it is within the stipulated time duration of **Six** years.

In addition to the above, once a student's term (Semester) is granted, he/she shall be allowed to appear and pass in any of the subsequent examinations held, provided the examinations are within the stipulated period of **Six** years.

In case the term (Semester) is not granted the student has to seek fresh admission in the next year and complete the term and pass the examination, also within **Six** years of his/her registration.

- **Programme Completion with Break in Between :**

A student who has passed M.C.A.–I and is seeking admission to M.C.A.–II after a long gap (Provided the gap lies within the stipulated duration of **Six** years) should complete the programme syllabus which is in existence at the time he has sought the admission for the academic year.

➢ **Programme Educational Objectives (PEO) :**

Within 3-5 years of education, graduates of MCA programme of CSIBER institute will be able to:

1. Design and develop quality software using emerging technologies as per industry standards

2. Exhibit lifelong learning capabilities with concern to drastic changes in emerging technologies.

3. Exhibit successful professional career by providing software solutions for complex problems in a time-bound manner.

4. Adopt themselves to the constantly evolving technology by peer reviewing, by working collaboratively and developing expertise in emerging fields.

➢ **Programme Outcomes**

PO 1: Apply the knowledge of computing and mathematics to understand problems in different domains.

PO 2: Analyze problems to identify and understand the requirements appropriate to its solution.

PO 3: Design and develop a computer-based solution to meet desired requirements with understanding of social concerns.

PO 4: Design and conduct experiments to identify alternative solutions and interpret results.

PO 5: Use current tools and techniques, advanced technological frameworks to enhance computing skills.

PO 6: Understanding professional, ethical, legal, security and social issues and responsibilities.

PO 7: Work effectively as an individual and in a team with diverse and multidisciplinary professionals to accomplish a common goal.

PO 8: Communicate effectively, comprehend and write effective reports and make effective presentations.

ASSESSMENT:

Taking into considerations of the UGC and AICTE requirements SIBER has adopted "Choice Based Credit System." (CBCS). A course can be either full credit (4 credits) or half credit (2 credits). A full credit course shall be of 60 contact hours duration and a half credit course shall be of 30 contact hours duration.

For Theory paper of 100 marks (**Four** credits) the distribution of the marks will be as follows –

- Internal Marks i.e. Concurrent evaluation   -   40 Marks
- External Marks i.e. End of Semester examination   -   60 marks

For Practical paper of 100 marks (**Four** credits) the distribution of the marks will be as follows –

- Practical Examination   -   40 Marks
- External Marks i.e. End of Semester examination   -   60 marks

For Theory paper of 50 marks (**Two** credits) the distribution of the marks will be as follows –

- Internal Marks i.e. Concurrent evaluation   -   20 Marks
- External Marks i.e. End of Semester examination   -   30 marks

Breakup of Internal Marks i.e. Concurrent evaluation -

Sr. No.	Head	Full Credit	Half Credit
1.	Class Participation	10 Marks	05 Marks
2.	Objective Test(Minimum One Test Per Unit)	10 Marks	05 Marks
3.	Seminar /Book Review/ Home Assignment/ Class Assignment	10 Marks	05 Marks
4.	Case Study / Term Paper	10 Marks	05 Marks
5.	**Total**	**40 Marks**	**20 Marks**

The final internal marks will be calculated using the heads shown in above table. **The internal marks obtained by the student has to be disclosed and signed by the student.**

For Practical examination of 40 marks there shall be three questions of 15 marks each, the student has to attempt any two. 10 marks reserved for journal.

- Journal marks   -   10 Marks
- Practical Marks i.e. End examination   -   30 Marks

The practical examination should be considered as one head of passing i.e. 40 marks.

For the Project Work of 100 marks, the distribution of the marks will be as follows –

▪ Internal Examiner	-	30 Marks
▪ External Examiner	-	30 Marks
▪ Seminar/Term Paper/ Industrial Seminar	-	40 Marks

For Theory Paper Assessment

1) The assessment of papers will be done by an Internal and External examiner. A difference of more than **20%** in the marks awarded by these examiners would necessitate the valuation of these papers by the Third examiner. The **'nearest'** highest marks will be considered for determining the average mark of such papers.

2) The examiner should submit the marks on separate sheet after completion of on-screen evaluation.

3) Once the Student is passed in the internal head of passing (Concurrent evaluation out of 40) in the report submitted to the examination department, the same should be carried forward whenever required.

4) The students who failed in the internal head of passing (Concurrent evaluation out of 40) should reappear for the same and the revised marks will be considered further calculation.

5) For AEC (Internal Course):

Internal Marks: Out of 50

i) Class Participation	- 10 Marks
ii) Quiz/Assignment/Journal	- 10 Marks
iii) Practical courses based on practical	- 30 Marks
examination and for other courses based on viva.	

(30 marks evaluation done jointly by internal and external examiners.)

STANDARD OF PASSING:

1. In order to pass in each passing head, a candidate should obtain 50% in the internal marks (Concurrent evaluation), 40% marks in theory, and minimum of 50% of the marks in aggregate.

2. To pass the M.C.A. examination, a candidate will have to pass in all Four Semester in Two Parts i.e. Part – I (Semester – I to II) and Part – II (Semester – III & IV)

3. To pass the Project work / Seminar course/ Term paper a candidate must obtain a minimum of 50% of the total marks. If a candidate fails in the seminar / project report/ term paper and its viva-voce, he/she will be required to complete the particular seminar / project report/ term paper and its viva-voce as a fresh candidate in the subsequent year.

4. A candidate from first year MCA will be eligible to proceed to the semester III ,if he/she is not having more than **five** courses backlog (25% of passing heads) from the first year (i.e. Semester I and II)

5. Semester Performance Index (SPI)/Cumulative Performance Index(CPI) will be as follows.

Grading System:

Full Credit 100 Marks

Grade Table for Trimester/Semester Examination			
Marks Obtained	Letter Grade	Grade Point	Description of Performance
96-100	S+	10.0	SUPER
91-95	S	9.0	
86-90	E+	8.5	Exemplary
81-85	E	8.0	
76-80	O+	7.5	Outstanding
71-75	O	7.0	
66-70	A+	6.5	Good
61-65	A	6.0	
56-60	B+	5.5	Average
50-55	B	5.0	
--	X	0.0	Defaulter
--	XX	---	Incomplete

Half Credit 50 Marks

Grade Table for Trimester/Semester Examination			
Marks Obtained	Letter Grade	Grade Point	Description of Performance
48 – 50	S+	10.0	SUPER
46 – 47	S	9.0	
43 – 45	E+	8.5	Exemplary
41 – 42	E	8.0	
38 – 40	O+	7.5	Outstanding
36 – 37	O	7.0	
33 – 35	A+	6.5	Good
31 – 32	A	6.0	
28 – 30	B+	5.5	Average
25 – 27	B	5.0	
--	X	0.0	Defaulter
--	XX	---	Incomplete

2. Final Result: For the final result of the student Cumulative Performance Index (CPI) based on total earned credits vis-à-vis total earned grade points shall be calculated will be as follows.

Total earned grade points / Total credits i.e. **128** credits.

Result		
CPI	**Final Grade**	**Classification of Final Result.**
9.0 – 10.0	S	Extraordinary
8.0 – 8.9	E	Excellent
7.0 – 7.9	O	Outstanding
6.0 – 6.9	A	Very Good
5.5 – 5.9	B+	Good
5.0 – 5.4	B	Average
0.0 – 4.9	X	Unsatisfactory (Fail)

Note: An aggregate of **5.0** credit points are required to pass the MCA program.

CALCULATION OF PERFORMANCE INDICES:

A distinction of the performance of one student from the other student is rather impossible to carry out from the grades obtained by a student in all the courses taken by him in a semester/year. Hence, the evaluation of various courses is cumulated in two performance indices termed as semester performance index (SPI) and cumulative performance index (CPI), the explanation of which is given below:

Semester Performance Index (SPI):

The performance of a student in a semester is indicated by a number called Semester Performance Index (SPI). SPI is the weighted average of all the grade points obtained by him in all the courses registered during the semester. If gi is a grade with numerical equivalent as gi obtained by a student for the course with credit Ci then, SPI for that semester is calculated using formula.

$$SPI = \frac{\sum_i C_i g_i}{\sum_i C_i}$$

where summation is for all the courses registered by a student and Semester SPI is calculated to two decimal places and rounded off. SPI once calculated shall never be modified. Generally, for the students failed in regular examinations SPI is calculated only after the declaration of re-examination grades.

Cumulative Performance Index (CPI):

An up-to-date assessment of the overall performance of a student from the first semester till completion of the programme is obtained by calculating an index called as Cumulative Performance Index (CPI). The CPI is weighted average of the grade points obtained in all the courses registered by a student since the first semester of the programme.

$$CPI = \frac{\sum_i C_i g_i}{\sum_i C_i}$$

Besides SPI, CPI is also calculated at the end of every semester upto two decimal places and is rounded off. It is necessary to ensure that one course appears only once in calculation of CPI and the denominator in above equation does not exceed the total number of credits registered by him.

GRACE MARKS UNDER DIFFERENT ORDINANCE.

S.O. No. 1:-Grace Marks for Passing in each head of Passing (Theory/Practical/Oral/ Sessional/External).

The Examinee shall be given the benefit of grace marks only for passing in each head of Passing Theory/Practical/Oral/Sessional/ in External examination as follows.

Head of Passing	Grace Marks
Up to – 50	2
051-100	3
101-150	4
151-200	5
201-250	6
251-300	7
301-350	8
351-400	9
And 401 and above.	10

Subject to the following conditions:

The benefit of such gracing marks in different heads of passing shall not exceed 1% of the aggregate marks in that examination.

The benefit of gracing of Marks under this Ordinance shall be applicable only if the candidate passes the entire examination of Semester.

The gracing is concurrent with the rules and guidelines of Professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, and CCIII. NCTE, UGC etc.

S.O. No. 2:- **Grace Marks for Getting Higher Class**

A Candidate who passes in all the courses and heads of passing in the examination without the benefit of either gracing or condonation rules and whose total number of Marks falls short for securing Second Class/Higher Second Class or First Class by marks not more 1% of the aggregate marks of that examination or up to 10 marks, whichever is less, shall be given the required marks to get the next higher class of grade as the case may be.

Provided that benefits of above mentioned grace marks shall not be given, if the candidate fails to secure necessary passing marks in the aggregate head of passing also, if prescribed in the examination concerned.

Provided further that the benefits of above mentioned grace marks shall be given to the candidate for such examination/s only for which provision of award of class has been prescribed.

Provided further that this gracing is concurrent with the rules and guidelines of Professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, and CCIII. NCTE, UGC etc.

S.O. No. 3 Condonation

If a candidate fails in more than one head of passing, his/her deficiency of marks in such head of passing may be condoned by not more than 1% at the aggregate marks of the examination. However condonation, whether in one head of passing or aggregate head of passing be restricted to maximum upto 10 marks only.

Condonation of deficiency of marks be shown in the statement of Marks in the form of asterisk and Ordinance number

Provided further that this gracing is concurrent with the rules and guidelines of Professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, and CCIII. NCTE, UGC etc..

BACKLOG:

1. A candidate will be permitted to proceed to the second Semester unconditionally even though he/she fails in one or more courses of the first semester, provided the first semester term is granted..

2. The students who have a backlog of not more than **five courses (25% of passing heads)** in the First year examination (Semester I & II) will be eligible to be admitted to the Second year (III Semester) of MCA.

3. A Candidate will be permitted to proceed to the Fourth Semester unconditionally even though he/she fails in one or more courses of the third semester, provided the third semester term is granted.

Selection of Elective Courses in MCA-II Semester-III and Semester- IV:

Second year of MCA programme offers dual specialization. In DSE-III and DSE-IV courses of MCA-II(Sem-III) four specializations based on current cutting edge technologies are offered as specializations from which the student has to opt any one specialization each from DSE-III and DSE-IV which will be continued for the remainder of the programme. i.e. the stream opted by the student in DSE-III of MCA-II(Sem-III) shall be continued in DSE-V of MCA-II (Sem-IV) and the stream opted by the student in DSE-IV of MCA-II(Sem-III) shall be continued in DSE-VI of MCA-II (Sem-IV).

Evaluation of Summer Industrial Project (SIP):

ForSummer Industrial Project (SIP) distribution of 40 marks for internal evaluation is as follows:

> Confidential Report   :   10 Marks
> Project Report   :   30 Marks

The project will be evaluated for 60 marks at the end of the third semester jointly by internal and external examiner for 30 marks each.

Evaluation of 40 marks of DSE courses:

All DSE courses will be evaluated practically by internal examiners at the end of semester examination.

CHHATRPATI SHAHU INSTITUTE OF BUSINESS EDUCATION AND RESEARCH (CSIBER)
University Road, Kolhapur – 416 004
Out Line Theory Question paper for all the programmes
(Four Unit Course)

Class:
Course Name: **Paper no. :**
Time: Three hours   **Total marks: 60**

INSTURUCTIONS:
1. Question no. 1 is **COMPULSORY**

2. Attempt any **FOUR** from Q. No.2 to Q. No.7.

3. Figures to right indicate **FULL** marks

                                        Marks

Q. 1) **Case study / Problems / Program (Based on Unit I to IV)** **(12)**

Q. 2) **Long Question / Brief answer Questions A and B (Based on Unit I)** **(12)**

Q. 3) **Long Question / Brief answer Questions A and B (Based on Unit II)** **(12)**

Q. 4) **(12)**

        a) Question (Based on Unit III)   06

        b) Question (Based on Unit III)   06

Q. 5) **(12)**

        a) Question (Based on Unit IV)   06

        b) Question (Based on Unit IV)   06

Q. 6) **(12)**

        a) Question (Based on Unit III)   06

        b) Question (Based on Unit IV)   06

Q. 7) **Write Short answers** **(12)**

        a) Based on Unit I   03

        b) Based on Unit II   03

        c) Based on Unit III   03

        d) Based on Unit IV   03

--------------------------xxxxxxxxxxxxxxxxxxx-----------------------------------

CHHATRPATI SHAHU INSTITUTE OF BUSINESS EDUCATION AND RESEARCH (CSIBER)
University Road, Kolhapur – 416 004
Out Line Theory Question paper for all the programmes
(Two Unit Course)

Class:
Course Name: **Paper no. :**
Time: Two hours   **Total marks: 30**

INSTURUCTIONS:
1.   Question no. 1 is **COMPULSORY**

2.   Attempt any **THREE** from Q. No.2 to Q. No.5.

3.   Figures to right indicate **FULL** marks

		Marks
Q. 1)	**Case study / Problems / Program (Based on Unit I or II)**	**(6)**
Q. 2)	**Long Answer Question (Based on Unit I)**	**(8)**
Q. 3)	**Long Answer Question (Based on Unit II)**	**(8)**
Q. 4)		**(8)**
	a) Brief Answer Question (Based on Unit I)	4
	b) Brief Answer Question (Based on Unit II)	4
Q. 5)		**(8)**
	a) Brief Answer Question (Based on Unit II)	4
	b) Brief Answer Question (Based on Unit I)	4

--------------------------xxxxxxxxxxxxxxxxxxx------------------------------------

CHHATRPATI SHAHU INSTITUTE OF BUSINESS EDUCATION AND RESEARCH (CSIBER)
University Road, Kolhapur – 416 004

NATURE OF PRACTICAL QUESTION PAPER

Time : 2 Hours   **Total Marks : 40**

Instructions:

      1.   **Attempt any two questions.**

      2.   **10 Marks are reserved for journal**

                                                             Marks

      Q. 1)   **(15)**

      Q. 2)   **(15)**

      Q. 3)   **(15)**

############

MCA SYLLABUS (Effective from 2021-22)

MCA-I Semester-I

Course Code	Course Name	Credits	Contact Hours	Int. Marks	Pract. Marks	Ext. Marks	Total Marks
CC-101	Computer Architecture and Operating system	4	60	40	--	60	100
CC-102	Software Engineering and Object Oriented Design	4	60	40	--	60	100
CC-103	Design and Analysis of Algorithms	4	60	40	--	60	100
CC-104	Programming with 'C'	4	60	--	40	60	100
CC-105	Web Design and Development	4	60	--	40	60	100
DSE-I (Any One)	A. Programming with Python. B. Programming with R.	4	60	40	--	60	100
AEC-I	a) Cross Platform Skills b) Problem Solving and Logical Skills c) Social Ethics d) Stress Management	2	30	50	--	--	50
	Total Credits	**26**	**390**	**210**	**80**	**360**	**650**

M. C. A. - I Semester-II

Course Code	Subject	Credits	Hours	Int. Marks	Pract Marks	Ext. Marks	Total Marks
CC-201	Relational Database Management Systems	4	60	40	--	60	100
CC-202	Mathematical & Statistical Foundation	4	60	40	--	60	100
CC-203	Linux Administration &Programming	4	60	40	--	60	100
CC-204	. Net Technologies	4	60	--	40	60	100
CC-205	Core Java	4	60	--	40	60	100
Project-I	Mini Project-I and Term Paper	4	60	40	--	60	100
DSE-II (Any One)	A. Full Stack Web Development B. Theoretical Computer Science	4	60	40	--	60	100
GE- I	A) Fundamentals of Management B) Environment and Development C) Indian Social Problems and Services D) Principles of Economics	2	30	20	--	30	50
AECC-I	Professional Communication Skills	2	30	20	--	30	50
	Total Credits	**32**	**480**	**240**	**80**	**480**	**800**

M. C. A. - II   Semester-III

Specializations given under : DSE-III and DSE-V	Specializations given under : DSE-IV and DSE-VI
DS : Data Science	MT : Mobile Technologies
DT : Dot Net Technologies	WD : Web Technologies
JT : Java Technologies	BC : Block Chain Technologies
DO : Develops Technologies	ST : Software Testing Technologies

Course Code	Course Name	Credits	Hours	Int. Marks	Pract Marks	Ext. Marks	Total Marks
CC-301	Computer Communication and Network	4	60	40	--	60	100
CC-302	Software Project Management and Quality Assurance	4	60	40	--	60	100
CC-303	Cloud Computing	4	60	40	--	60	100
CC-304	Mobile Computing with Android	4	60	--	40	60	100
CC-305	Data and File Structures	4	60	--	40	60	100
Project - II	Industrial Summer Project (60 Days)	4	60	40	--	60	100
DSE-III	**DS-I** Machine Learning using Python **DT-I** ASP. NET MVC and Entity Framework **JT- I** Struts and Hibernate Framework **DO- I** GIT, Docker, CI/ CD with Jenkins Pipeline	4	60	40	--	60	100
DSE-IV	**MT- I** Hybrid Mobile App Development using Flutter **WD- I** Advanced Web Technologies **BC- I** Ethereum Block Chain development with solidity and Truffle **ST- I** Software Testing Strategies and Techniques	4	60	40	--	60	100
GE- II	A) Entrepreneurship Development B) Disaster Management C) Corporate Social Responsibility D) Basics of Indian Economy	2	30	20	--	30	50
AECC-II	Employability Skills	2	30	20	--	30	50
	Total Credits	**36**	**540**	**280**	**80**	**540**	**900**

MCA SYLLABUS (Effective from 2021-22)

M. C. A. - II   Semester-IV

Course Code	Course Name	Credits	Hours	Int. Marks	Pract. Marks	Ext. Marks	Total Marks
CC-401	Information Security and Cryptography	4	60	40	--	60	100
CC-402	Internet of Things	4	60	40	--	60	100
CC-403	Block chain Technology	4	60	40	--	60	100
CC-404	Artificial Intelligence	4	60	--	40	60	100
CC-405	Data Warehousing and Data Mining	4	60	--	40	60	100
Project -III	Mini Project-II Industrial Seminars	4	60	40		60	100
DSE-V	**DS-II** Big Data Analytics **DT-II** Windows Communication Foundation and Web Services **JT- II** Spring framework (Spring MVC, Spring Boot, Spring Angular, Spring Security) **DO- II** Container Management Using Kubernets	4	60	40	--	60	100
DSE-VI	**MT- II**iOS and Swift Programming **WD- II** Full Stack Web Development using MEAN Stack and MERN Stack **BC- II** Decentralized Block Chain App Development on Hyperledger Fabric using Composer **ST- II** Automated Software Testing	4	60	40	--	60	100
AEC-II	a) Deployment Skills Open Source Platform Work Ethics b) Organization Behavior	2	30	20		30	50
	Total Credits	**34**	**510**	**260**	**80**	**510**	**850**

Total Credits:

Semesters	Core Credits	DSE	AEC	GE	AECC	Total
I	**5 x 4 = 20**	**1 x 4= 4**	**1 x 2= 2**			**26**
II	**6 x 4 = 24**	**1 x 4= 4**		**1 x 2= 2**	**1 x 2= 2**	**32**
III	**6 x 4 = 24**	**2 x 4= 8**		**1 x 2= 2**	**1 x 2= 2**	**36**
IV	**6 x 4 = 24**	**2 x 4= 8**	**1 x 2= 2**			**34**
Total	**92**	**24**	**4**	**4**	**4**	**128**
Percentage	**71.83**	**18.75**	**3.125**	**3.125**	**3.125**	**100**
Total marks	**2300**	**600**	**100**	**100**	**100**	**3200**