Chhatrapati Shahu Institute of Business Education and Research

An Autonomous Institute under UGC & Shivaji University

School of Computer Science & Applications

STRUCTURE AND SYLLABUS OF

B.Sc. in Computer Science (Entire)
(B.Sc. (CS) (ENTIRE))
Program under the Faculty of Science

TO BE IMPLEMENTED FROM ACADEMIC YEAR 2024-25

CURRICULUM OF B.SC.. (CS) (ENTIRE) PROGRAMME

The B.SC.. (CS) (ENTIRE) is a Full Time program of Three/Four-year duration and is divided into six/eight semesters. Semester I & II will be taught in the First Year of the program with a provision of exit after successfully completion of first year with certificate, semester III & IV during the second year of the program with a provision of exit after successfully completion of second year with diploma, Semester-V and VI during third year of the program with a provision of exit after successfully completion of third year with B.SC.. (CS) (ENTIRE), semester VII and VIII during fourth year after successful completion of fourth year B.SC.. (CS) (ENTIRE) (Honors).

PROGRAMME OBJECTIVE:

To develop a technical, management and communication skills that lays solid foundation for higher studies and/or create trained future ready human assets for industry.

ELIGIBILITYFOR ADMISSION:

Passed 10 + 2 (HSC) or its equivalent examination (As per the AICTE APH 2024 - 2027)

Candidates appearing for 10 + 2 (HSC) or its equivalent examination are also eligible to appear for CET

TOTAL INTAKE: 60/120/180

Reservation:

Reservation policy for special categories such as SC, ST, NT, OBC, etc. will be as per the prevailing rules & regulations of Government of Maharashtra, DTE Maharashtra, AICTE and UGC, New Delhi from time to time.

DURATION:

B.SC.. (CS) (ENTIRE) is a full time program of **THREE/FOUR** Years duration. The program consists of Six/Eight 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), the examination to be held in the Fifth and Sixth Semester will be called Part – III (Third Year) and if student enrolls for fourth year the examination to be held in the Seventh and Eighth Semester Part – IV (Fourth Year)

If a candidate fails to clear all heads of passing within **SIX** years of his/her first year registration, the past performance will stand automatically nullified.

If a candidate discontinues any of the terms (i.e. Semester – I to VIII) on any account, will be allowed to complete the incomplete 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.

After taking the admission for FIRST YEAR and the Semester term (Semester – I or II) is NOT granted in this case 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. After taking the admission for FIRST YEAR and the

Semester term (Semester – I and II) is NOT granted in this case student performance will be nullified.

After taking the admission for SUBSEQUENT YEARS, the Semester term (Semester – III,IV,V,VI,VII,VIII) is NOT granted in this case 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 first year registration.

Program Completion with Break in Between:

A student who has passed B.SC.. (CS) (ENTIRE) – I/ II/ III and is seeking admission subsequent year after a long gap (Provided the gap lies within the stipulated duration of **SIX** years) should complete the program **syllabus which is in existence** at the time he has sought the admission for the subsequent year.

Undergraduate Programmes: Undergraduate programmes will include the following

(i) **UG Certificate programme:** UG Certificate Programme leads to a UG certificate after completing 1 year (2 semesters) of study in the chosen fields of study. Students on exit shall be awarded UG certificate (in the Field of Study/Discipline) after securing the requisite 44 Credits on completion of Semester II if, in addition, they complete one work based/skill based vocational course/internship of 4 credits within one year from the completion of 2nd semester examination. These students are allowed to re-enter the degree programme within a period of three years and complete the degree within the stipulated maximum period of seven years.

(ii) **UG Diploma Programme:** UG Diploma Programme leads to a UG diploma after 2 years (4 semesters) of study in the chosen fields of study. Students on exit shall be awarded UG Diploma (in the Field of Study/Discipline) after securing the requisite 88 Credits on completion of Semester IV if, in addition, they complete one work based/skill based vocational course/internship of 4 credits within one year from the completion of 4th semester examination. These students are allowed to re-enter the degree programme within a period of three years and complete the degree within the maximum period of seven years.

(iii) **Three Year UG Degree Programme (BA, B.Sc, B.B.A., B.P.E.S. and Bachelors in other disciplines) with single/double major:** Students who wish to undergo a 3-year (6semester) UG programme shall be awarded UG degree in the Major discipline after successful completion of three years, securing a minimum of 132 credits. Provision of double Major shall be implemented in due course of time.

(iv) **Four Year UG Programme with honours (BA, B. Sc, B.B.A., B.P.E.S. and Bachelors in other disciplines) with single/double major:** Students who wish to undergo a 4-year (8 semester) UG programme shall be awarded UG Honours degree in the Major discipline after successful completion of four years, securing a minimum of 176 credits. Provision of double Major shall be implemented in due course of time.

(v) **Four Year UG Programme with honours with Research (BA, B. Sc, B.B.A., B.P.E.S. and Bachelors in other disciplines) with single/double major:** Students who wish to undergo a 4-year (8 semester) UG programme shall be awarded UG Honours and research degree in the

Major discipline after successful completion of four years with a rigorous research project, securing a minimum of 176 credits. Provision of double Major shall be implemented in due course of time.

Award of degree:

Provision of Multiple Exit:

Exit 1: There is a provision of exit after successful completion of 1 year (two semesters). A Certificate will be awarded when a student exits at the end of year 1 (2 semesters). Students who have secured minimum of 44 credits will be awarded a UG certificate (in the field of study/discipline) if, in addition, they complete one work based/skill based vocational course/internship of 4 credits within one year from the completion of 2nd semester examination.

Exit 2: There is a provision of exit after successful completion of 2 years (four semesters. A Diploma will be awarded when a student exits at the end of year 2 (4 semesters). Students 23 who have secured minimum of 88 credits will be awarded a UG Diploma (in the field of study/discipline) if, in addition, they complete one work based/skill based vocational course/internship of 4 credits within one year from the completion of 4th Semester examination.

Exit 3: Three Year UG Degree Programme (BA, BSc, BBA and Bachelor in other discipline) with single/double major: There is a provision of exit after successful completion of 3 years (six semesters). Students who wish to undergo a 3-year UG programme shall be awarded UG degree in the major discipline after successful completion of three years, securing 132 credits.

Four Year UG Programme with Honours (BSc, BBA and Bachelor in other discipline) with single/double major: Students who wish to undergo a 4-year (8 semester) UG programme shall be awarded UG Honours degree in the major discipline after successful completion of four years with Discipline Specific Elective Courses in 7th and 8th semesters in lieu of Research Project and Dissertation, securing a minimum of 176 credits.

Four Year UG Programme with Honours with Research (BA, BSc, BBA and Bachelor in other discipline) with single/double major: Students who wish to undergo a 4-year (8 semester) UG programme shall be awarded UG Honours with Research degree in the major discipline after successful completion of four years, with Research Project and Dissertation in 7th and 8th Semesters, securing 176 credits

At the end of each semester credits earned by the students will be uploaded Academic Bank Credits (ABC) of each student. A Student who earns 44 credits after successful completion of first year and willing to exit will be awarded Certificate in computer applications. After successful completion of second year with 88 credits Diploma in Computer Applications will be awarded, After successful completion of third year with 132 credits B.SC.. (CS) (ENTIRE) degree will be awarded, and if student continues for fourth year by earning 176 credits B.C.A (Honors) degree will be awarded.

Qualification type and Minimum credit requirement:

Equivalent National Higher Education Qualification Framework (NHEQF)	Qualification title	Minimum credit requirement
Level 5	Undergraduate Certificate	44+4
Level 6	Undergraduate Diploma	88+4
Level 7	Bachelor's Degree	132
Level 8	Bachelor's Degree (Honours and Honours with Research)	176

Minimum eligibility criteria for multiple entry points of the UG programmes

1st year: Senior Secondary School Leaving Certificate or Higher Secondary (Class 12) Certificate obtained after successful completion of Grade 12 or equivalent stage of education and/or Admission test conducted by University/National Level Testing Agency.

2nd year: A certificate obtained after successful completion of 1 year (2 semesters) of the undergraduate programme. These students are to take admission in the 2nd year within a period of three years from obtaining the UG certificate from University/institution recognized by Govt. of India.

3rd year: A diploma obtained after successful completion of 2 years (4 semesters) of the undergraduate programme. These students are to take admission in the 3rd year UG programme within a period of three years from obtaining the UG diploma from University/institution recognized by Govt. of India.

4th Year (Honours): A Bachelor's degree after successful completion of three years (6 semesters) of the Undergraduate programme obtained from University/institution recognized by Govt. of India. These students are to complete the degree within the stipulated maximum period of seven years.

4th Year (Honours with Research): A three-year Bachelor Degree with a minimum of 7.5 CGPA. The minimum entry requirement for 4th year (Honours/Research) UG programme within a period of three years from obtaining 3 year Bachelor Degree from University/institution recognized by Govt. of India.These students are to complete the degree within the stipulated maximum period of seven years.

The admission or eligibility criteria shall be fixed by the Academic Council from time to time whenever necessary.

Statutory reservation policy of the Government of India shall be followed in case of selection of eligible candidates for admission.

General features of the program under NEP:

a) New structure will be implemented with effect from Academic Year 2023-24
b) Credits offered per Semester will be a Minimum of 20 and a Maximum of 22
c) B.C.A Program is based on Major, Minor, Vocational Skill, Skill enhancement, Value Education, Indian Knowledge, co-curricular and open elective courses.
d) The exit option at the end of each year of the B.SC.. (CS) (ENTIRE) program will commence from AY 2024-25.

e) Re-entry to complete the B.SC.. (CS) (ENTIRE), after taking the exit option, will be permissible up to 06 years from the date of admission to the program as per the existing syllabus.

Credit Specification:

i) Theory Course: A minimum of 15 hrs. of teaching per credit is required in a semester.

ii) Laboratory Course / Field Project: A minimum of 30 hrs. in Laboratory activities per credit is required in a semester.

Outline of Program Structure:

1. **Major Courses:** A course which should compulsorily be studied by a candidate as Core Course.
2. **Minor Elective :** A course which should compulsorily be studied by a candidate which is in supportive of major course.
3. **Vocational Skill:** Supporting to major subject for imparting practical skills.
4. **Skill enhancement:** Imparting hands on, practical skills and soft skills it could chosen from pool basket.
5. **Value Education** : Courses imparting knowledge about constitution, democracy, social issues and environment.
6. **Indian Knowledge System: It covers knowledge assets from prehistoric to the current period.**
7. Co-curricular: Multidisciplinary courses for holistic development of students.
8. Open elective : Supporting courses to be selected from pool basket.

Credit Pattern:

Every course offered will have three components associated with the teaching-learning process of the course, namely

Lecture - L, Tutorial - T, Practice - P

Where, **L** stands for ***Lecture*** session, **T** stands for ***Tutorial*** Session consisting participatory discussion / self-study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes and **P** stands for ***Practice*** Session and it consists of Hands on experience / Laboratory Experiments / Field Studies / Case studies that equip students to acquire the much required skill component.

B.SC.. (CS) (ENTIRE) consists of all the three components with weightage depending upon the paper.

If a course is of 4 credits, then the different credit distribution patterns in L: T: P format could be:

Theory Papers: 3: 0.5: 0.5

Practical: 1: 0: 3.0

Programme Outcomes

1. Conceptual Knowledge

   Nurturing a foundation of comprehensive understanding and analytical thinking.

2. Research and Innovation

Fostering a spirit of research and innovation among students for formulating novel solutions.

3. Collaborative Learning

Imbibing collaboration and leadership skills for individual growth and collective empowerment.

4. Problem Solving and Critical Thinking

Developing critical thinking skills for problem solving and innovative solutions to meet dynamic challenges.

PSO

Proficiency in core computing domains

To enhance logical ability and programming concepts by implementing programming lab.

Design of Computational Systems

Ability to identify, formulate, analyse and solve problems of programming using different languages

Cutting-Edge Tools Usage

Preparing students for future aspects by building and improving their creativity, social awareness, and general knowledge

Proficiency in Application Domain:

Ability to understand the changes or future trends in the field of computer application.

ASSESSMENT:

Each course is half credit (2 credits) course with 30 contact hours duration.

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

- Internal Marks i.e. Formative Assessment - 10 Marks
- External Marks i.e. End of Semester examination - 40 marks

Breakup of Internal Marks i.e. Formative Assessment-

Sr. No.	Head	Half Credit
1.	Class Participation	05 Marks
3.	Seminar /Book Review/ Home Assignment/ Class Assignment/ Case Study / Term Paper	05 Marks
	Total	**10 Marks**

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

For Practical examination of 50 marks there shall be three questions of 20 marks each, the student has to attempt any two questions and 10 marks reserved for journal.

- Journal marks - 10 Marks
- Practical Marks i.e. End examination - 40 Marks

The practical examination should be considered as one head of passing i.e. 50% marks.

For the Research Project /Field Project of 50 marks, the distribution of the marks will be as follows –

- Internal Examiner - 20 Marks
- External Examiner - 20 Marks
- Project Report - 10 Marks

Semester VI – Internship Project Evaluation (4 credits)

Students are required to complete one month internship after Semester II examination and evaluation of the same will be at the end of Semester III. (4 credits)

End of Semester Evaluation (60 Marks)			
	Presentation	**Viva**	**Marks**
Internal Examiner	15	15	30
External Examiner	15	15	30
Total			60
Internal Evaluation (40 Marks)			
Project Report			10
Mentor evaluation based on attendance & Progress report			10
Industry Confidential Report			20
Total			40

Semester Integrated – Semester VII – Research Project 4 **credit project work**

Project group size – Max 3

End of Semester Evaluation (60 Marks)			
	Presentation	**Viva**	**Marks**
Internal Examiner	15	15	30
External Examiner	15	15	30
Total			60
Internal Evaluation (40 Marks)			
Attendance			10
Progress Report			10
Project Report			20
Total			40

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. Once the Student is passed in the internal head of passing (Formative Assessment out of 10) and marks report submitted to the examination department are not changed in any case, the same should be carried forward whenever required.
3. The students who failed in the internal head of passing (Formative Assessment out of 10) should reappear for the same and the revised marks will be considered for further calculation.
4. There shall be FIVE questions (20 marks each) in question paper and student has to attempt any THREE questions. The detailed question paper nature is included in the syllabus.

STANDARD OF PASSING:

1. In order to pass in each passing head, a candidate should obtain 50% in the internal marks (Formative Assessment), 40% marks in theory, and minimum of 50% of the marks in aggregate in passing head.
2. To pass the B.SC.. (CS) (ENTIRE). examination, a candidate will have to pass in all Six/Eight Semesters in Three/Four Parts i.e. Part – I (Semester – I to II), Part – II (Semester – III & IV), Part-III (Semester-V & VI) and Part-IV (Semester-VII & VIII)
3. To pass the Research Project /Field Project 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 will be promoted to next year, if he/she is not having more than **SIX** courses backlog (25% of passing heads) from the current year
5. If student passed in the internal head (formative assessment) as well as theory examination but fails in aggregate (total) head of passing in that case student has to appear only for the theory examination.
6. If students fails in internal marks (formative assessment), and passed in the theory examination, in that case students has to complete the internal marks in next subsequent semester at that time student must clear the

aggregate head of passing.

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

8. If student fails in internal marks (formative assessment), and passed in the theory examination, in that case student has to complete the internal marks in nest subsequent semester at that time the student must clear aggregate head of passing.

9. if student is passed in internal head (formative assessment) as well as theory examination but fails in aggregate (total) head of passing the student has to appear only for theory examination.

Grading System:

Full Credit 100 Marks

Grade Table for Trimester/Semester Examination

Marks Obtained	Letter Grade	Grade Point
96-100	S+	10.0
91-95	S	9.0
86-90	E+	8.5
81-85	E	8.0
76-80	O+	7.5
71-75	O	7.0
66-70	A+	6.5
61-65	A	6.0
56-60	B+	5.5
50-55	B	5.0
--	X	0.0
--	XX	---

Half Credit 50 Marks

Grade Table for Trimester/Semester Examination

Marks Obtained	Letter Grade	Grade Point
48 – 50	S+	10.0
46 – 47	S	9.0
43 – 45	E+	8.5
41 – 42	E	8.0
38 – 40	O+	7.5
36 – 37	O	7.0
33 – 35	A+	6.5
31 – 32	A	6.0
28 – 30	B+	5.5
25 – 27	B	5.0
--	X	0.0
--	XX	---

5. 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. **44/88/132/176** credits.

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

Note: An aggregate of **5.0** credit points are required to pass the M.Sc. 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 in that 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

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

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

Provided further that this gracing is concurrent with the rules and guidelines of Professional statutory bodies at the All India level such as AICTE, UGC and Shivaji University 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, UGC and Shivaji University 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, UGC and Shivaji University etc..

BACKLOG:

1. A candidate will be permitted to proceed to the second Semester 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 **SIX courses (25% of passing heads)** in the current year examination will be eligible to be admitted to the next year of B.SC.. (CS) (ENTIRE)
3. A Candidate is permitted to proceed to the even Semester even though he/she fails in one or more courses of the odd semester, provided the odd semester term is granted.

NO VERIFICATION OF MARKS AND RE-EVALUATION:

As CSIBER adopted the double evaluation system as well as ONSCREEN evaluation system due to this the verification of marks and re-evaluation of Answer book facility is NOT available in CSIBER.

CHHATRPATI SHAHU INSTITUTE OF BUSINESS EDUCATION AND RESEARCH (CSIBER)

University Road, Kolhapur – 416 004

Theory Question Paper Nature for B.SC.. (CS) (ENTIRE)

(Two Unit Course)

Class:

Subject:

Paper no. :

Time: Two hours **Total marks: 40**

INSTURUCTIONS:

1. Question no. 5 is **COMPULSORY**
2. Attempt any **Three** from Q. No. 1 and Q. No. 4.
3. Figures to right indicate **FULL** marks

		Marks
Q. 1)	**Long Answer Question (Based on Unit I)**	**(10)**
Q. 2)	**Long Answer Question (Based on Unit II)**	**(10)**
Q. 3)	**Long Answer Question / Brief Answer Question A and B (Based on Unit I or II)**	**(10)**
Q. 4)	**Long Answer Question / Brief Answer Question A and B (Based on Unit I or II)**	**(10)**
Q. 5)	**Write Short Notes (Any Two)** **a) Based on Unit I** **b) Based on Unit II** **c) Based on Unit I or II**	**(10)**

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CHHATRPATI SHAHU INSTITUTE OF BUSINESS EDUCATION AND RESEARCH (CSIBER)

University Road, Kolhapur – 416 004

Practical Question Paper Nature for B.SC.. (CS) (ENTIRE)

Class:

Subject:

Paper no. :

Time: Two hours **Total marks: 50**

Instructions:

1. Attempt any **TWO** questions.
2. Each Question carried **20** Marks
3. **Ten** Marks are reserved for journal

		Marks
Q. 1)	**ONE LONG QUSTION / DIVIDE QUESTION INTO TWO BITS**	**(20)**
Q. 2)	**ONE LONG QUSTION / DIVIDE QUESTION INTO TWO BITS**	**(20)**
Q. 3)	**ONE LONG QUSTION / DIVIDE QUESTION INTO TWO BITS**	**(20)**

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School of Computer Science and Applications
B.Sc. (Computer Science) I Structure as per NEP 2020
Level 4.5 (FY) Semester - I

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MM-101	MJ	Fundamentals of Computer	02	--	--	10	40	**50**	02	--	--	**02**
MM-102		Programming using C-I	02	--	--	10	40	**50**	02	--	--	**02**
MM-103		Programming using C-I Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
VSC-101	VSC	Office Automation	--	--	04	10	40	**50**	--	--	02	**02**
SEC-101	SEC	Web Technology	02	--	--	10	40	**50**	02	--	--	**02**
AEC-101	AEC	Business Communication	02	--	--	10	40	**50**	02	--	--	**02**
VEC-101	VEC	Democracy and Governance	02	--	--	10	40	**50**	02	--	--	**02**
IKS-101	IKS	Indian Knowledge System	02	--	--	10	40	**50**	02	--	--	**02**
OE-101	OE	a) Fundamentals of Ecology & Environment I	02	--	--	10	40	**50**	02	--	--	**02**
OE-102		Web Technology Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
CC- 101	CC	Sports/Yoga	--	--	04	50	--	**50**	--	--	02	**02**
Total			**14**	**00**	**16**	**150**	**400**	**550**	**14**	**00**	**08**	**22**

Level 4.5 (FY) Semester - II

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MM-201	MM	Programming using C-II	02	--	--	10	40	**50**	02	--	--	**02**
MM-202		Database Management System I	02	--	--	10	40	**50**	02	--	--	**02**
MM-203		Programming using C-II Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
VSC-201	VSC	SQL	02	--	--	10	40	**50**	02	--	--	**02**
MN-201	MN	Fundamentals of Cyber Security	02	--	--	10	40	**50**	02	--	--	**02**
OE-201	OE	a) Fundamentals of Ecology & Environment II	02	--	--	10	40	**50**	02	--	--	**02**
OE-202		SQL Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
SEC-201	SEC	Mathematical Foundation	02	--	--	10	40	**50**	02	--	--	**02**
AEC-201	AEC	Soft Skill	02	--	--	10	40	**50**	02	--	--	**02**
VEC-201	VEC	Introduction to Democracy	02	--	--	10	40	**50**	02	--	--	**02**
CC-201	CC	Business Writing	--	--	04	50	--	**50**	--	--	02	**02**
Total			**16**	**00**	**12**	**150**	**400**	**550**	**16**	**00**	**06**	**22**

Exit option: Award of UG Certificate in Major with 40-44 credits and an additional 4 credits core SWAYAM course/ Internship

Level 5.0 (SY) Semester - III

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MM-301	MM	Introduction to Software Engineering	02	--	--	10	40	**50**	02	--	--	**02**
MM-302		Database Management System II	02	--	--	10	40	**50**	02	--	--	**02**
MM-303		Data Structures I	02	--	--	10	40	**50**	02	--	--	**02**
MM-304		Data Structures I Laboratory	--	--	04	10	15	**25**	--	--	02	**02**
MN-301	MN	Computer Networks I	02	--	--	10	40	**50**	02	--	--	**02**
MN-302		Basics of Statistics	02	--	--	10	40	**50**	02	--	--	**02**
MN-303		Algorithms I	02	--	--	10	40	**50**	02	--	--	**02**
OE-301	OE	Mini Project I	--	--	04	10	40	**50**	--	--	02	**02**
VSC-301	VSC	Database Management System II Laboratory	--	--	04	10	15	**25**	--	--	02	**02**
AEC-301	AEC	Employability Skill	--	--	04	10	40	**50**	--	--	04	**02**
FP-301	FP	Field Project-I	--	--	04	10	40	**50**	--	--	02	**02**
Total			**12**	**00**	**20**	**110**	**390**	**500**	**12**	**00**	**10**	**22**

Level 5.0 (SY) Semester – IV

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MM-401	MM	Software Project Management	02	--	--	10	40	**50**	02	--	--	**02**
MM-402		Object-oriented Programming using C++	02	--	--	10	40	**50**	02	--	--	**02**
MM-403		Web Development using PHP & MySQL	02	--	--	10	40	**50**	02	--	--	**02**
MM-405		C++ Programming Laboratory	--	--	04	20	30	**50**	--	--	02	**02**
MN-401	MN	Computer Networks II	02	--	--	10	40	**50**	02	--	--	**02**
MN-402		Operations Research	02	--	--	10	40	**50**	02	--	--	**02**
MN-403		Theoretical Computer Science	02	--	--	10	40	**50**	02	--	--	**02**
OE-401	OE	Mini Project II	--	--	04	10	40	**50**	--	--	02	**02**
SEC-401	SEC	Web Development using PHP & MySQL Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
AEC-401	AEC	Algorithms II	02	--	--	10	40	**50**	02	--	--	**02**
CEP-401	CEP	Field Project – I	--	--	04	10	40	**50**	--	--	02	**02**
Total			**14**	**00**	**16**	**120**	**430**	**550**	**14**	**00**	**08**	**22**

Exit option: Award of UG Diploma in Major with 80-84 credits and an additional 4 credits core SWAYAM course/ Internship OR Continue with Major and Minor

Level 5.5 (TY) Semester – V

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	**TU**	**PR**	**CE**	**EE**	**Total**	**TH**	**TU**	**PR**	**Total**
MM-501	MM	Operating System I	02	--	--	10	40	**50**	02	--	--	**02**
MM-502		Java Programming I	02	--	--	10	40	**50**	02	--	--	**02**
MM-503		Mobile Application Development	02	--	--	10	40	**50**	02	--	--	**02**
MM-504		Java Programming I Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
MM-505		Mobile Application Development Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
ME-501(a)	ME	Machine Learning I	02	--	--	10	40	**50**	02	--	--	**02**
ME-502(a)		Machine Learning I Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
			OR									
ME-501(b)		.NET Technology I	02	--	--	10	40	**50**	02	--	--	**02**
ME-502(b)		.NET Technology I Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
MN-501	MN	Cloud Computing	02	--	--	10	40	**50**	02	--	--	**02**
MN-502		Information Security	02	--	--	10	40	**50**	02	--	--	**02**
VSEC-501	VSEC	Software Testing	02	--	--	10	40	**50**	02	--	--	**02**
FP-501	FP	Field Project – II	--	--	04	10	40	**50**	--	--	02	**02**
Total			**14**	**00**	**16**	**110**	**440**	**550**	**14**	**00**	**08**	**22**

Level 5.5 (TY) Semester – VI

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MM-601	MM	Operating System II	02	--	--	10	40	**50**	02	--	--	**02**
MM-602		Python Programming	02	--	--	10	40	**50**	02	--	--	**02**
MM-603		Java Programming II	02	--	--	10	40	**50**	02	--	--	**02**
MM-604		Python Programming Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
MM-605		Java Programming II Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
ME-601(a)	ME	Machine Learning II	02	--	--	10	40	**50**	02	--	--	**02**
ME-602(a)		Machine Learning II Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
		OR										
ME-601(b)		.NET Technology II	02	--	--	10	40	**50**	02	--	--	**02**
ME-602(b)		.NET Technology II Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
MN-601	MN	Computer Architecture	02	--	--	10	40	**50**	02	--	--	**02**
MN-602		Linux Administration	02	--	--	10	40	**50**	02	--	--	**02**
OJT-601	OJT	Internship*	--	--	08	20	80	**100**	--	--	04	**04**
Total			**12**	**00**	**20**	**110**	**440**	**550**	**12**	**00**	**10**	**22**

*** Students shall complete on-job training/Internship in industry/organization/on-campus for 240 hours with 8 hrs/day preferably during winter vacations after Semester V examinations and commencement of Semester VI**

Exit option: Award of UG Degree in Major with 132 credits

Level 6.0 Hon. Degree Semester – VII

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MMHD-701	MM	Block Chain Technology	04	--	--	20	80	100	04	--	--	**04**
MMHD-702		Data Warehousing	04	--	--	20	80	100	04	--	--	**04**
MMHD-703		Full Stack	02	--	--	10	40	50	02	--	--	**02**
MMH D-704		Full Stack Laboratory	--	--	04	10	40	50	--	--	02	**02**
MMHD-705		Internet of Things	02	--	--	10	40	50	02	--	--	**02**
MEHD-701(a)	ME	Ethical Hacking	02	--	--	10	40	50	02	--	--	**02**
MEHD-702(a)		Ethical Hacking Laboratory	--	--	04	10	40	50	--	--	02	**02**
		OR										
MEHD-701(b)		Big Data	02	--	--	10	40	50	02	--	--	**02**
MEHD-702(b)		Big Data Laboratory	--	--	04	10	40	50	--	--	02	**02**
RMHD-701	RM	Fundamentals of Research Methodology	04	--	--	20	80	100	04	--	--	**04**
Total			**18**	**00**	**12**	**110**	**440**	**550**	**18**	**00**	**04**	**22**

Level 6.0 Hon. Degree Semester – VIII

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MMHD-801	MM	Hybrid Application Development	02	--	--	10	40	**50**	02	--	--	**02**
MMHD-802		Artificial Intelligence	04	--	--	20	80	**100**	04	--	--	**04**
MMHD-803		Augmented Reality	04	--	--	20	80	**100**	04	--	--	**04**
MMHD-804		Compiler Construction	--	--	04	10	40	**50**	--	--	02	**02**
MMHD-805		DevOps	02	--	--	10	40	**50**	02	--	--	**02**
MEHD-801(a)	ME	Generative AI	02	--	--	10	40	**50**	02	--	--	**02**
MMHD-802(a)		Generative AI Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
		OR										
MEHD-801(b)		Database Security	02	--	--	10	40	**50**	02	--	--	**02**
MMHD-802(b)		Web Security	--	--	04	10	40	**50**	--	--	02	**02**
OJTHD-801	OJT	Internship *	--	--	08	20	80	**100**	--	--	04	**04**
Total			**14**	**00**	**16**	**110**	**440**	**550**	**14**	**00**	**08**	**22**

Award of Four years UG Honors Degree in Major and Minor with 176 credits

Level 6.0 Hon. Research Semester – VII

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MMHRD-701	MM	Block Chain Technology	04	--	--	20	80	**100**	04	--	--	**04**
MMHRD-702		Data Warehousing and Mining	04	--	--	20	80	**100**	04	--	--	**04**
MMHRD-703		Internet of Things	02	--	--	10	40	**50**	02	--	--	**02**
MEHRD-701(a)	ME	Ethical Hacking	02	--	--	10	40	**50**	02	--	--	**02**
MEHRD-702(a)		Ethical Hacking Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
		OR										
MEHRD-701(b)		Big Data	02	--	--	10	40	**50**	02	--	--	**02**
MEHRD-702(b)		Big Data Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
RMHRD-701	RM	Fundamentals of Research Methodology	04	--	--	20	80	**100**	04	--	--	**04**
RPHRD-701	RP	Research Project	04	--	--	20	80	**100**	04	--	--	**04**
Total			**20**	**00**	**04**	**110**	**440**	**550**	**20**	**00**	**02**	**22**

Level 6.0 Hon. Research Semester – VIII

Course Code	Course Type	Course Name	Teaching Scheme Hrs/Week			Examination Scheme and Marks			Credits			
			TH	TU	PR	CE	EE	Total	TH	TU	PR	Total
MMHRD-801	MM	ARVR	04	--	--	20	80	**100**	04	--	--	**04**
MMHRD-802		Quantum Computing	04	--	--	20	80	**100**	04	--	--	**04**
MMHRD-803		Compiler Construction	02	--	--	10	40	**50**	02	--	--	**02**
MEHRD-801(a)	ME	Generative AI	02	--	--	10	40	**50**	02	--	--	**02**
MEHRD-802(a)		Generative AI Laboratory	--	--	04	10	40	**50**	--	--	02	**02**
		OR										
MEHRD-801(b)		Database Security	02	--	--	10	40	**50**	02	--	--	**02**
MEHRD-802(b)		Web Security	--	--	04	10	40	**50**	--	--	02	**02**
RPHRD-801	RP	Research Project	--	--	16	20	80	**100**	--	--	08	**08**
Total			**12**	**00**	**20**	**110**	**440**	**550**	**12**	**00**	**10**	**22**

Award of Four years UG Honors Degree in Major and Minor with 176 credits