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Department of Computer Science

Syllabus for M.Sc. in Computer Science

with effect from the

Academic Session 2020-21

Syllabus of Post Graduate Course in Computer Science(ChoiceBased CreditSystem)

SYLLABUSOVERVIEW

P.G. course of studies in Computer Science shall be of two years duration divided into four Semesters:Semester I, II, III and IV each of six months duration and the Term End Examinations will beconducted at the end of each semester. Syllabus for P.G. course in Computer Science is hereby framedbasedon thefollowingschemes and structures.

Using the guidelines of the University, Choice Based Credit System is offered. Core Courses shouldcompulsorily be studied by all the students of the department. The major elective courses will run inSemester III and in Semester IV. For major elective courses a student would choose from a pool ofcourses (offered by the department divided in groups) from his/her main subject of study. In case ofopen elective course, a student would choose from a pool of courses from other department(s). TheOutreach Programme is one kind of extension activity towards the society which will be helpful for astudent in skill development and direct communication to the society. For Add-on Course, the studentshave tochoosea coursefromapool ofcourses.

Total marks are 1200 of which each semester is of 300 marks. 20% marks are allotted for InternalAssessment for each theoretical paper. There is only one practical paper which is in Semester II. InSemester III, the first two theoretical papers are general and there are also two special papers, the lastbutonetheoreticalpaper isopenelectivepaperandthelastoneis“OutreachProgramme”.InSemester IV, thefirst two theoretical papers are general and the next two papers arespecial papers,the fifth paper is the Add on Course. The project work/dissertation paper is last paper in this semesterand the marks distribution for this is as follows: 20 Marks for written submission, 20 Marks forSeminar presentation and 10 Marks for Viva-Voce. Faculty members of the department will supervisethe students for project work**.** In Semester III the department will offer a cluster of special papersdivided into groups and the students will have to choose special papers according to the norms to bedecided by the Department.The corresponding papers are to be continued as special papers inSemester IValso.

PROGRAMMEOUTCOMES

Computer Science is becoming a popular choice for students around the world. A PG degree in Computer Science can open several new opportunities, especially getting to work with trending technologies such as Big data, Machine learning, Data handling, Network architects, Database Management. ThePGcourse under CBCS is so designed to make the learners to master in the subject. The learnerscan learn almost all areas of Computer Science and Applications. A number of special papers areoffered to cover the recent research areas so that the students have the chance for research. Thesyllabus is highly oriented to the NET/SET/GATE and other competitive examinations and thelearnerswillbeabletocracktheNationalandInternationallevelofexaminationsaftercompletion of the course. We are offering special papers which have huge industrial, businessandengineeringapplicationsandalsoresearchscopes.Aftercompletion ofthecoursethestudents will not only earn the PG degree but they will be able to crack several examinationslike, SSC, PSC, UPSC, RAIL, etc. The Outreach Programme will help the studentsto understand the outreach peoples to make them understand the usage of Computer Science and Applications. TheAdd-on-Course includes the Machine Learning, Python, R which will be helpful to develop their skills.In the project paper the students will be given some advanced topics as their dissertation papersand they will be oriented for research activities. They will learn the type settings, presentationskill andinteraction methods.

Curriculum Structure

SEM	Paper Code	Paper Title	Credits	Marks*
SEM-I	MCSCCT101	Programming Languages	4	40+10
	MCSCCT102	Advance Operating Systems	4	40+10
	MCSCCT103	Design and Analysis of Algorithms	4	40+10
	MCSCCT104	Mathematical Foundations	4	40+10
	MCSCSP105	Operating System Lab	4	50
	MCSCSP106	Programming & Algorithm Analysis Lab	4	50
SEM-II	MCSCCT201	Formal Languages and Automata Theory	4	40+10
	MCSCCT202	Advanced Database Management	4	40+10
	MCSCCT203	Advanced Computer Networks	4	40+10
	MCSCCT204	Information Security and Coding Theory	4	40+10
	MCSCSP205	Network Lab	4	50
	MCSCSP206	Database Lab	4	50
SEM-III	MCSCCT301	Compiler Design	4	40+10
	MCSCCT302	Artificial Intelligence and Expert Systems	4	40+10
	MCSMET303	Major Elective-I (Special Paper-I)	4	40+10
	MCSCSP304	Compiler Design and Artificial Intelligence Lab	4	40+10
	MCSOET305	Open Elective	4	50
	MCSOPP306	Outreach Programme	4	50
SEM-IV	MCSCCT401	Data Analytics	4	40+10
	MCSCCT402	Advanced Software Design	4	40+10
	MCSMET403	Major Elective-II(Special Paper-II)	4	40+10
	MCSMET404	Major Elective-III(Special Paper-III)	4	40+10
	MCSACT405	Add on Course	4	50
	MCSMEP406	Project and Seminar	4	50

***(Internal Assessment: 10 Marks, Semester End Exam: 40 Marks)**

MAJOR ELECTIVES/ SPECIAL PAPERS

Students must choose the Major Electives I, II and III from the same group

Elective Group-A: Data Science

A1: Machine Learning
A2: Deep Learning
A3: Computer Vision and Pattern Recognition
A4: Business Analytics
A5: Natural Language Processing
A6: Big Data Modelling and Management

Elective Group-B: Cyber Security

B1: Network Security
B2: Digital Forensic
B3: Post Quantum Cryptography
B4: Hardware Security
B5: Cyber Law and Ethics
B6: Information and Coding Theory

Elective Group-C: Distributed System and Resources

C1: Distributed Systems
C2: Internet of Things
C3: Service Oriented Computing
C4: Semantic Web
C5: Multimedia Systems and Virtual Reality
C6: Cloud Computing