

SNDT Women's University
Syllabus
Masters of Science
in
Computer Science (MSc-CS)



SNDT Women's University
Sir Vithaldas Thackersey Vidyavihar,
Juhu Road, Santacruz West, Mumbai 400 049.
(Applicable to students taking admission in and after 2019)

(Sem I, II, III and IV: Modified on 6th July 2019 Ad-hoc BOS)

GENESIS

The SNDT Women's University, the pioneer Women's University in India, was founded on June 2, 1916 by Maharshi Karve with 5 students.

Today, the University has an enrolment of over 50000 students (including those from Junior Colleges) in the formal as well as the non-formal streams, 166 Colleges, 39 University Departments, 4 Faculties and 4 Campuses.

The pioneer Women's University has been in the service of Indian women from all walks of life in a variety of ways for the last nine decades. In its endeavor to give the best in science and technology, as well as to enhance research functions, the University established its computer center in 1985 with the assistance of U.G.C. for an 'O' level and higher level system and has a well-functioning computer center with adequate trained staff. The University was selected by the U.G.C. for conducting the Postgraduate Diploma in Computer Science and Applications (PGDCSA) in 1985 and for conducting the Master of Computer Applications (MCA), now AICTE approved, in 1989 and Master of Science in Computer Science [M. Sc. (CS)] from 2013. These courses follow the prescribed syllabus with a thrust for both theoretical computer science as well as applications.

The response to these courses conducted by the University is overwhelming. Thirty three batches of PGDCSA and twenty nine of MCA students have completed the course and are employed in India and abroad. The alumnae work for some of the best institutions in the world.

The SNDT Women's University is affirmative in its commitment to the empowerment of women through education and pursues excellence unstintingly. The University has obtained an A grade from the National Assessment and Accreditation Council (NAAC).

Vision: *Sanskrita Stree Parashakti*

An Enlightened Woman is a source of Infinite Strength

Mission: Empowerment of Women through Education

OPPORTUNITY

In the rapidly changing area of computer science and technology there is an ever-growing shortage of trained manpower required in educational institutions as well as industry. This problem has been identified as early as 1980 by Rajaraman Committee on Computer Manpower Development and has been reiterated by various panels and study groups set up by the DoE since then. In order to enable one to cope with the ever growing and fast changing technology it is essential for one to acquire appropriate formal training. India has set up priorities, made plans and visualized grand schemes to enter the information technology era, the 21st century. It is clear that this will bring about advances in technology especially in areas such as electronics, space research, biomedical engineering, computer science, communications and genetics.

Computer science is both a pure science as well as an applied science, hence requires a large number of highly qualified personnel. The requirement of personnel can be identified to be in the following sectors viz. manufacturing and maintenance of computer, computer users such as industry and data center, government departments, educational and research organizations, national projects such as that of railways and defense and the growing area of software export.

Computer software development is also a profession particularly suitable for women. As the infra-structural facilities grow, many women will be able to work from their homes, meeting the needs of both the home and the job. This department has so far trained over 755 PGDCSA students and about 946 MCA's who are well placed around the globe. We shall not let any opportunity pass lest they may never come back. The department is proud of its students and its own performance during the last 34 years.

POSTGRADUATE DEPARTMENT OF COMPUTER SCIENCE

The Shreemati Nathibai Damodar Thackersey (SNDT) Women's University Post-Graduate Department of Computer Science offers three courses at the post-graduate level, Master of Computer Applications (MCA – 3 years, full-time), Master of Science (Computer Science) (M.Sc.(CS) – 2 years, full-time) and Post Graduate Diploma in Computer Science and Applications (PGDCSA – 1 year, full time). SNDT admits candidates to MCA based on performance in the state level entrance examination conducted by Directorate of Technical Education (DTE), subject to the eligibility criteria set by DTE. Admission to the PGDCSA course is given by the P.G. Department of Computer Science directly.

1. Objectives

- To provide technical education to women to catalyses their empowerment.
- To fulfill the national need for trained teachers and researchers in Computer Science.
- To promote advanced research, doctoral and postdoctoral work.
- To support the efforts of the University to promote computer awareness and utilization in the various departments.

2. Major Thrust Areas

- Train highly competent computer software professionals needed by the industry.
- Strengthen teaching, research and consulting in the area of computer applications.
- Develop software for the improvement of educational testing and software for students with learning disability.
- Promote teaching materials and manpower for computer science education.
- Participate actively in professional bodies and industry to contribute to the society at large.
- Interact with some of the best in the computing profession to give exposure to students and faculty.
- Establish links with national and international organizations for advanced training and research in computer science.

3. Computing Facility

There are three computer laboratories with best hardware and latest software.

4. Interaction with Industry and Employment

The Department makes consistent efforts to improve the courses to make them relevant. Various industries and Computer organizations are involved in this effort. They do so by functioning on the Department's advisory bodies. The Department gets support from industries for teaching as well.

Our past students are employed in some of the finest companies in the world. Some of the students are pursuing higher studies in Computer Science, in India and abroad.

5. Association with Research and Development Organizations

In addition to its linkages with industry the University had signed Memoranda of Understanding with several R&D endeavours with a view to strengthening its academic programmes, and enhancing research facilities of the Department of Computer Science. The co-signatories are:

- a. Centre for Development of Advanced Computing (CDAC), formerly NCST, Mumbai.
- b. Nuclear Power Corporation of India Limited
- c. The Tata Power Company Limited, Andheri, Mumbai
- d. Renaissance Mumbai Convention Centre Hotel & Lakeside Chalet- Mumbai, Marriott Executive Apartments.
- e. Safe Pvt. Ltd, Andheri(E), Mumbai
- f. Selec Controls Pvt. Ltd, Mumbai
- g. School of Education and Communication, Jonkoping University, Sweden The department is an institutional member of professional bodies such as Computer Society of India.

6. Research Activities

The Department is actively involved in research in the following areas:

- a. Artificial Intelligence (AI)
- b. Image Processing
- c. Secure Communication
- d. Web Technologies
- e. Software Engineering and project management
- f. Geographical Information System
- g. Internet of Things
- h. Cyber Security
- i. Data Warehousing & Data Mining
- j. Machine Learning

7. Self-Enrichment Courses

A series of programmes in the areas of personality development, interview techniques, communication etc. will be arranged.

8. Faculty

The Department has its own full time qualified and experienced faculties for lectures and practical. Several faculty members are actively involved in various areas of research and software development.

9. Visiting Faculty

The University has been receiving the support of research and educational institutions in Mumbai such as IIT (Mumbai), BARC, C-DAC, etc. The Department also receives support from several talented and well-experienced professionals from the Industry as visiting faculty.

10. Library

The University has excellent library facilities having about 2000 volumes of recent editions pure as well as applied computer science. The library subscribes to several leading Indian as well as foreign journals in computer science and related areas. In order to supplement these, the department maintains an appreciable collection of books and journals that are available to the students all the time.

11. Service to other Departments

This department has played a significant role in helping other departments set up computer laboratories; conduct computer related courses and computer awareness programmes.

12. Students and Departmental Activities

The Department makes consistent efforts to improve the quality of the courses it conducts as well as to maintain acceptable standards. In order to develop as well as to assess the individual competence there are regular tests as well as assignments. There is a continuous internal assessment for 50marks. The end of semester examination has a weightage of 50 marks. Group work and collaborative efforts are inculcated by having departmental projects as well as by attaching a group of students to a member of the faculty for discussions, etc. The problem solving capabilities are developed and reinforced by administering aptitude tests, programming assignments and even by organizing various contests. Visits to Computer Centers and Research and Development Organizations with advanced and sophisticated facilities widen the horizon and perspective of students. Experts from Industry, Consultancies and Research Institutes are invited to give lectures on specialized topics. Efforts are made to develop leadership qualities, and other desirable personality traits through extra-curricular activities as well as workshops on personality development, problem solving, etc. Interview techniques and lectures on 'job expectations' prepare them to face the challenges of job seeking. Student participation in the running of the department is achieved by having well-functioning Students Council. There are active student chapters of the Association for Computing Machinery (ACM) and Computer Society of India (CSI). Digital library access is available to the members of the ACM. Students are involved in National Service Scheme (NSS) a community service.

13. Students Council:

Students Council Objectives:

The Students council formally represents the students and endeavors to improve the department. The council shall strive to solve the problems of students being a liaison between the students and the faculty.

Composition:

The student's council is a body composed of

The General Secretary (GS)

Two Assistant General Secretaries (AGS)

Treasurer

Eight Council Members

14. Extra-Curricular Activities

The Juhu Campus of the University has excellent facilities for indoor as well as outdoor activities.

15. Vacation

Students normally get Diwali, Christmas, and summer vacations as per university norms.

Fee Structure:

([M. Sc. (CS)] I year: Rs. 46020/-

Fees are subject to revision.

Master of Science (Computer Science) [M. Sc. (CS)]

MSc-CS SEMESTER-I

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
1101	Operating Systems	4		4	50	50	100
1102	Software Engineering and Project Management	4	-	4	50	50	100
1103	Data Structures and Analysis of Algorithm	4	-	4	50	50	100
1104	Cyber Security	4	-	4	50	50	100
1105	Data Communications and Networking	4	-	4	50	50	100
1201	Operating Systems Lab	-	2	2	25	25	50
1202	Data Structures and Algorithm Lab	-	2	2	25	25	50
Total					24		600

MSc-CS SEMESTER-II

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
2101	Web Technology	4		4	50	50	100
2102	Computer Organization and Architecture	4	-	4	50	50	100
2103	Database Management Systems	4	-	4	50	50	100
2104	Design & Analysis of Algorithms	4	-	4	50	50	100
2105	Elective-I	4	-	4	50	50	100
2201	Web Technology Lab	-	2	2	25	25	50
2202	Database Management Systems Lab	-	2	2	25	25	50
Total					24		600

MSc-CS SEMESTER-III

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
3101	Object Oriented Programming with Java	4		4	50	50	100
3102	Dataware housing and Data Mining	4	-	4	50	50	100
3103	Research Methodology	4	-	4	50	50	100
3104	Mobile Application Development using Android Programming	4	-	4	50	50	100
3105	Elective-II	4	-	4	50	50	100
3201	Java Lab	-	2	2	25	25	50
3202	Android programming lab	-	2	2	25	25	50
Total					24		600

MSc-CS SEMESTER-IV

Code	Subject	L	P/T	Cr	Ext.	Int.	Total
4101	Research Seminar	-	-	8	100	100	200
4102	Internship-Project	-	-	16	200	200	400
Total				24			600

Elective-I	Elective-II
1. Software Testing and Tools	1. Image Processing
2. Big Data Analytics	2. Digital Forencics
3. Computer Graphics	3. Geographical Information Systems
4. Enterprise Resource Planning	4. Internet of Things
	5. Multimedia Applications

SEMESTER				1 Credit = 25 Marks Total Credits = 96 Total Marks = 96*25 = 2400
I	II	III	IV	
24	24	24	24	

ASSESSMENT:

- (I) The final total assessment of the candidate is made in terms of an internalassessment and an external assessment for each course.
- For each theory paper, 2credit will be based on internal assessmentand 2 credits for end examination (externalassessment), where as the lab papers 1 creditis for internal and one for external.
 - It is mandatory to pass the internal exam of each Subject and hence is eligible for external exams.
 - The division of the 25marks allotted to internal assessment oftheory papers is on the basis of Attendance of 5 marks and5 assignment throughout the semester of 5 marks and two written test of 15 marks each taken during the semester(avarage of two should be taken).
 - The marks of the practical's / lab would be given on external practiceexam & oral.
 - No Theory Questions or Exams to be conducted. Only Programs will be asked. Output Questions can be asked.
 - The internal marks will be communicated to the University at theend of each semester.These marks will be considered for the declaration of the results.
- (II) Examination:
Examinations shall be conducted at the end of the semester i.e. DuringDecember and in May, However supplementary examinations will also beheld in December and May.

Students have to pass both the internal assessment and external assessment separately.

Total marks obtained = Internal marks + External marks