SNDT Women's University
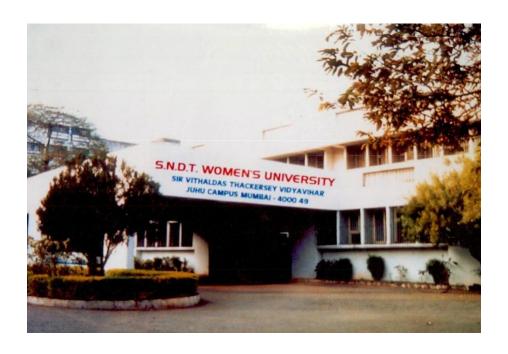
Syllabus

Masters

in

Computer Applications (MCA)

SNDT Women's University

Sir VithaldasThackerseyVidyavihar,

Juhu Road, Santacruz West, Mumbai 400 049.

(Applicable to batch 2020-21)

(Sem-I to Sem-IV: last Modified on 08th April 2020 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: *SanskritaStreeParashakti*

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 ShreematiNathibaiDamodarThackersey (SNDT) Women's University Post-Graduate Department of Computer Science offers three courses at the post-graduate level, Master of Computer Applications (MCA – 2 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 catalyzes 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 endeavors with a view to strengthening its academic programs, 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

6. **Self-Enrichment-Courses**

A series of programs 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 programs.

12. **Students and Departmental Activity**

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:**

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.

MCA SEMESTER-I

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
1101	Mathematical Foundation of Computer Science	4	-	4	50	50	100
1102	Research Methodology and IPR	4	-	4	50	50	100
1103	Advanced Data Structure	3	-	3	25	50	75
1104	Advanced Java (Contents: spring, MVC, Net Beans and Hibernate)	3	-	3	25	50	75
1105	Computer Network Programming using Linux	3	-	3	25	50	75
1201	Advanced Data Structure Lab		4	2	25	25	50
1202	Advanced Java lab	-	4	2	25	25	50
1203	Computer Network Programming Lab	-	4	2	25	25	50
1204	Research paper I - Literature Review (review paper)	-	2	1	25	-	25
	Total			24			600

MCA SEMESTER-II

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
2101	Managerial Economics	4	-	4	50	50	100
2102	Software Architecture	4	-	4	50	50	100
2103	Artificial Intelligence	3	-	3	25	50	75
2104	Advanced Databases	3	-	3	25	50	75
2105	Elective-I	3	-	3	25	50	75
2201	Web Engineering Lab(Contents: CSS, Angular js, node js, PhP, Mysql,etc)	-	4	2	25	25	50
2202	Software Testing and Quality Assurance Lab	-	4	2	25	25	50
2203	Mobile Computing lab	-	4	2	25	25	50
2204	Artificial Intelligence Lab	-	4	2	25	25	50
2205	Advanced Databases Lab	-	4	2	25	25	50
2206	Research paper II - Research Mini Project	-	2	1	25	-	25
	Total			28			700

MCA SEMESTER-III

Code	Subject	L	Pr.	Cr.	Int. Exam.	Ext. Exam.	Total Marks
3101	Cyber Security	3	-	3	25	50	75
3102	Data science and Analytics	3	-	3	25	50	75
3103	Cloud Computing	3	-	3	25	50	75
3104	Machine learning	3	-	3	25	50	75
3105	Elective-II	3	-	3	25	50	75
3201	Data science and Analytics lab (Content: Implementation using Python)	-	4	2	25	25	50
3202	Cloud computing Lab	-	4	2	25	25	50
3203	Elective-II Lab	-	4	2	25	25	50
3204	Machine learning lab	-	4	2	25	25	50
3205	Research Paper III- Presentation / Publication (Content: Technical communication for Research Paper Writing, Rubrics for evaluation)	-	2	1	25	-	25
	Total			24			600

MCA SEMESTER-IV

Code	Subject	L	P/T	Cr	Int. Exam.	Ext. Exam.	Total
4101	Project	-	-	16	200	200	400
4102	Swayam based MOOC	-	-	4	-	100	100
	Total			20			500

Names of Elective-I	Names of Elective-II
Image Processing	Soft Computing
Ethical hacking	GIS
IOT	Cyber Physical System
Game theory	NLP
Block Chain	Big Data Analytics

SEMESTER CREDITS				1 Credit (Practical)=2 Hrs
I	II	III	IV	1Credit(Theory)=1Hr
24	28	24	20	1 Credit = 25 marks Total Credits=96 Total Marks=96*25=2400

- **Lab Components are practical oriented and no theory examinations will be conducted. Practical examinations will be conducted and evaluated by Internal and External Examiners.**
- **Int. Exam: C.A: Internal examination and continuous assessment involves two internal test + Assignments/ Presentation/ Oral/ Viva/Group Discussion etc**

Terms Used:-

Pr.: Practical

C.A.: Continuous Assessment

Tw: Term Work

Cr.: Credits

Int.: Internal

Ext.: External

ASSESSMENT:

The final total assessment of the candidate is made in terms of an internal assessment and an external assessment for each course.

1. For each theory paper, credit will be based on internal assessment and 2 credits for end examination (external assessment), whereas the lab papers 1 credits for internal and one for external.
2. It is mandatory to pass the internal exam of each Subject and hence is eligible for external exams.
3. The division of the internal marks allotted to internal assessment of theory papers is on the basis of Attendance and assignment throughout the semester and two written test of each taken during the semester.

4. The marks of the practical's / lab would be given on external practical exam & oral. No Theory Questions or Exams to be conducted. Only Programs will be asked. Output Questions can be asked.

5. The internal marks will be communicated to the University at the end of each semester. These marks will be considered for the declaration of the results.

   Examination:
   Examinations shall be conducted at the end of the semester i.e. During December and in May, However supplementary examinations will also be held in December and May.

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

   Total marks obtained = Internal marks + External marks