॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

Established on 17th September, 1994. Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

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विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत राष्ट्रीय शैक्षणिक धोरण २०२० नुसार पदव्यूत्तर द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२४–२५ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, या विद्यापीठा अंतर्गत येणा–या सर्व संलग्नित महाविद्यालयामध्ये शैक्षणिक वर्ष २०२४–२५ पासून राष्ट्रीय शैक्षणिक धोरणानुसार पदव्यूत्तर द्वितीय वर्षाचे अभ्यासक्रम लागू करण्याच्या दृष्टीकोनातून विज्ञान व तंत्रज्ञान विद्याशाखे अंतर्गत येणा–या अभ्यासमंडळांनी तयार केलेल्या पदव्यूत्तर द्वितीय वर्षाच्या अभ्यासक्रमांना मा. विद्यापरिषदेने दिनांक १५ मे २०२४ रोजी संपन्न झालेल्या बैठकीतील विषय क्रमांक १५/५९–२०२४ च्या ठरावाअन्वये मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील खालील एम. एस्सी द्वितीय वर्षाचे अभ्यासक्रम (Syllabus) लागू करण्यात येत आहेत.

1) M. Sc. II year - Analytical Chemistry (Affiliated College)
2) M. Sc. II year - Biochemistry (Affiliated College)
3) M. Sc. II year - Organic Chemistry (Affiliated College)
4) M. Sc. II year - Physical Chemistry (Affiliated College)
5) M. Sc. II year - Inorganic Chemistry (Affiliated College)
6) M. Sc. II year - Analytical Chemistry (Campus)
7) M. Sc. II year - Industrial Chemistry (Campus)
8) M. Sc. II year - Medicinal Chemistry (Campus)
9) M. Sc. II year - Organic Chemistry (Campus)
10) M. Sc. II year - Physical Chemistry (Campus)
11) M. Sc. II year - Polymer Chemistry (Campus)
12) M. Sc. II year - Computer Management (Affiliated College)
13) M. Sc. II year - Computer Sciene (Affiliated College)
14) M. Sc. II year - Software Engineering (Affiliated College)
15) M. Sc. II year - System Administration & Networking (Affiliated College)
16) M. Sc. II year - Computer Application (Campus)
17) M. Sc. II year - Computer Network (Campus)
18) M. Sc. II year - Computer Science (Campus)
19) M. Sc. II year - Zoology (Campus)
20) M. Sc. II year - Zoology (Affiliated College)
21) M. Sc. II year - Physics (Campus)
22) M. Sc. II year – Physics (Affiliated College)

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
जा.क्र.:शै–१/एनइपी/विवत्रंविपदवी/२०२४–२५/993
दिनांक १३.०६.२०२४

डॉ. सरिता लोसरवार
सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत : १) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
३) मा. प्राचार्य, सर्व संबधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) मा. संचालक, सर्व संकुले परिसर व उपपरिसर, प्रस्तुत विद्यापीठ
५) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदर परिपत्रक संकेतस्थळावर प्रसिध्द करण्यात यावे.

Swami Ramanand Teerth Marathwada University

Nanded

Faculty of Science and Technology

NEP-2020 Oriented Structure of Post Graduate Programs

(as per Govt of Maharashtra GR dated 16-05-2023)

SY M.Sc. Computer Network(Campus)

(2 years full time PG Programs)

Introduced from Academic Year 2024-2025

Program code: { SCS-S-MSCN-PG (13-2-1-02)}

From the Desk of the Dean, Faculty of Science and Technology

Swami Ramanand Teerth Marathwada University, Nanded, enduring to its vision statement "***Enlightened Student: A Source of Immense Power",***is trying hard consistently to enrich the quality of science education in its jurisdiction by implementing several quality initiatives. Revision and updating curriculum to meet the standard of the courses at national and international level, implementing innovative methods of teaching-learning, improvisation in the examination and evaluation processes are some of the important measures that enabled the University to achieve the **3Es, the *equity, the efficiency and the excellence*** in higher education of this region. To overcome the difficulty of comparing the performances of the graduating students and also to provide mobility to them to join other institutions the University has adopted the *cumulative grade point average* (CGPA) system in the year 2014-2015. Further, following the suggestions by the UGC and looking at the better employability, entrepreneurship possibilities and to enhance the latent skills of the stakeholders the University has adopted the *Choice Based Credit System* (CBCS) in the year 2018-2019 at graduate and post-graduate level. This provided flexibility to the students to choose courses of their own interests. To encourage the students to opt the world-class courses offered on the online platforms like, NPTEL, SWAYM, and other MOOCS platforms the University has implemented the credit transfer policy approved by its Academic Council and also has made a provision of reimbursing registration fees of the successful students completing such courses.

SRTM University has been producing a good number of high caliber graduates; however, it is necessary to ensure that our aspiring students are able to pursue the right education. Like the engineering students, the youngsters pursuing science education need to be equipped and trained as per the requirements of the R&D institutes and industries. This would become possible only when the students undergo studies with an updated and evolving curriculum to match global scenario.

Higher education is a dynamic process and in the present era the stakeholders need to be educated and trained in view of the self-employment and self-sustaining skills like start-ups. Revision of the curriculum alone is not the measure for bringing reforms in the higher education, but invite several other initiatives. Establishing industry-institute linkages and initiating internship, on job training for the graduates in reputed industries are some of the important steps that the University would like to take in the coming time. As a result, revision of the curriculum was the need of the hour and such an opportunity was provided by the New Education Policy 2020. National Education Policy 2020 (NEP 2020) aims at equipping students with knowledge, skills, values, leadership qualities and initiates them for lifelong learning. As a result the students will acquire expertise in specialized areas of interest, kindle their intellectual curiosity and scientific temper, and create imaginative individuals.

The curriculum given in this document has been developed following the guidelines of NEP-2020 and is crucial as well as challenging due to the reason that it is a transition from general science-based to the discipline-specific-based curriculum. All the recommendations of the ***SukanuSamiti*** given in the **NEP Curriculum Framework-2023** have been followed, keeping the disciplinary approach with rigor and depth, appropriate to the comprehension level of learners. All the Board of Studies (BoS) under the Faculty of Science and Technology of this university have put in their tremendous efforts in making this curriculum of international standard. They have taken care of maintaining logical sequencing of the subject matter with proper placement of concepts with their linkages for better understanding of the students. We take this opportunity to congratulate the Chairman(s) and all the members of various Boards of Studies for their immense contributions in preparing the revised curriculum for the benefits of the stakeholders in line with the guidelines of the Government of Maharashtra regarding NEP-2020. We also acknowledge the suggestions and contributions of the academic and industry experts of various disciplines.

We are sure that the adoption of the revised curriculum will be advantageous for the students to enhance their skills and employability. Introduction of the mandatory ***On Job Training, Internship*** program for science background students is praise worthy and certainly help the students to imbibe first-hand work experience, team work management. These initiatives will also help the students to inculcate the workmanship spirit and explore the possibilities of setting up of their own enterprises.

Dr.L.M.Waghmare **Dr.M.K.Patil,**
Dean,*FacultyofSci&Tech.* ***AssociateDean,****FacultyofSci&Tech.*

From Desk of Chairman, Board of Studies of the Subject Computer Science and Application

The School of Computational Sciences, SRTMUN exists since inception of the University and offers Masters, M.Phil. and Ph.D. programs. The Master's Degree Programs, M.Sc.(CS), M.Sc.(CN) and M.Sc.(CA), being officered are two years full time post graduate programs revised with industry expectations. The School of Technology, Sub Centre, Latur offers M.Sc.(CS) since last one decade. Theseall programs have four semesters, which are normally completed in two years. These programs as per NEP-2020 guidelines are flexible enough so that within discipline and cross discipline migration choices of relevant courses are given to the students under electives courses. There are program specific core subjects. The students can choose relevant electives from the same program or from other programs of the same school. The Evaluation of performance of a student for the course is based on principle of continuous assessment through internal and external evaluation mechanisms. NEP-2020 policy had emphasis given on imparting skills to students.The eligibility criteria and fees structure shall be same as that of Campus Prospectus.

In compliance with the NEP -2020 guidelines, various resolutions passed by the UGC, Government of Maharashtra, directions of the *SUKANU SAMITEE*, Hon'ble Vice Chancellor's directions, Pro Vice Chancellor's timely guidance,rigorous exercise taken by the Dean and Associate Dean, (Science and Technology), resolution passed by the apex bodies, all faculties in the school have assisted BoS for preparing 2 years full time M.Sc. Computer Application, M.Sc. Computer Network and M.Sc. Computer Science programs being taught by the school in the light of NEP-2020. In Doing so, all members agreed unanimously to adhere the UGC guidelines, guidelines of the Government of Maharashtra, guidelines of the *SUKANU SAMITEE*as well as SRTMUN policy draft on NEP-2020 being circulated to the school for all M.Sc. programs. The model NEP-2020syllabus framed by Prof R.D. Kulkarni committee was also reviewed. It was decided to have first year common for all M.Sc. programs under school which will help students to have minimum common skills leading to PG Diploma in Computer Science and Application, under first year exist option. While framing program specific core and electivescourses, the interdisciplinary applications of Computers, IT, Scientific computing allied courses were found out across the various disciplines and relevant courses have been put.

While framing syllabus as per NEP-2020 pattern, care has been taken to consider local needs placed in a national context so as to fulfill global demands. Due care is taken to introduce application oriented interdisciplinary learning.Therefore, students pursuing post graduation degrees over here, in specific courses are encouraged to imbibe knowledge and skills which enable all round personality development, skill enhancement and in-depth learning of technology platforms.Under the NEP-2020pattern, students would post graduate M.Sc. programs with a total number of 88 credits which includes compulsory, program specific core, program specific elective and relevant electives across from the choices available in the each semester.The directions given by Hon'ble Vice Chancellor sir reading *intra school* and *inter school* electives was specifically accepted by the committee and due care is taken to embed subject relevant courses. Accordingly, horizontal and vertical migration among all M.Sc. and MCA programs with other programs offered by other schools in the campus is allowed. However, Model MCA syllabus as per NEP-2020 has to come yet. The discussions with Hon'ble Pro Vice Chancellor sir lead to following specific agenda of the syllabi

1. To provide mobility and flexibility for students within and outside the Computational Science School as well as to migrate between institutions
2. To help students to learn at their own pace
3. To have provision for relevant elective courses
4. To impart more job oriented skills to students
5. To make any course multi-disciplinary in approach

In order to move ahead on the agenda, the BoS committee members continuously sat together 04 times in last two months. This activity started in April 2023 and finally ended on 25th May 2023. There were discussions on a uniform structure per semester, as per the Govt. of Maharashtra GR dated 16-05-2023, which is likewise to be extended across all semesters so as to make a M.Sc. program worth of 88 credits. All the semesters have 22 credits each. Accordingly, first two semesters are common. The third and fourth semesters have major and elective courses to be completed, as per the rationale of the program. The major courses have been designed as per the perspective of CA/CN and CS programs. These are program specific courses which enable in depth learning in the allied programs. The electives are designed as per the relevant demand of a course in IT industry / Research area. The project development activity was intentionally introduced in third and fourth semesters of every program so as give a real time feel of industry activities to the students. An unified course numbering system was used for proper numbering of all courses was adopted as suggested in common template/ daft guidelines of the university.

The definition of credit in is finally taken as per the NEP-2020, SRTMUNpolicy, as a weightage to a course, to be given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours.

A core course is the course offered by the parent program, totally related to the major subject, components.

An Elective Course is also offered by the parent program whose objective is to provide choice and flexibility within the program.

The student can choose his/her elective paper. Elective is related to the major subject. The difference between core course and elective course is that there is choice for the student. The program is at liberty to offer certain number of elective courses any semester. The objective of elective is to provide mobility and flexibility outside the parent program. This is introduced to make every course multi-disciplinary in nature. It is to be chosen from a list of courses offered by various programs in the school. The list is given in the syllabus copy. All faculties were told to outline the specific courses of their interest and elaborate them further with objectives and outcome. The final version of syllabi is outcome oriented which smoothes the understanding of students regarding the skills he/she will be getting after the completion of the program. This has also made faculties to be specialized of the courses being drafted by them.

In order to see the employability of the skills being imparted through these syllabi, the syllabi gist was telephonically consulted with Industry experts. Due care is taken to incorporate suggestions and modifications given by these experts. These experts are 1) Dr.ParvinPawar, Philips Research Lab, Bangalore, 2) Mr. Sanjay Kurundkar, Creve Info Tech Ltd, Pune, 3) Mr.AshishTendulakr, Google Inc, Pune

M.Sc. Computer Network (Campus)

M.Sc. Computer Network (2years) program / degree is a specialized program in latest advances in computer network issues. It builds the student on higher studies and research awareness in overall computational application fields so as to become competent in the current race and development of new computational sciences. The duration of the study is of four semesters, which is normally completed in two years.

NEP-2020 pattern: The M.Sc. Computer Network program as per NEP-2020 and CBCS (Choice based credit system) pattern, in which choices are given to the students under electives. The students can choose open electives from the wide range of options to them.

Eligibility and Fees : The eligibility of a candidate to take admission to this is as per the eligibility criteria fixed by the University. More details on admission procedure and fee structure can be seen from the prospectus of the college / institution as well as on website of the University.

Credit Pattern: Every course has corresponding grades marked in the syllabus structure. There are 22 credits per semester. A total of 88 credits are essential to complete this program successfully. The Grading pattern to evaluate the performance of a student is as per the University rules.

Every semester has a combination of Theory (core or elective) courses, internship, other relevant courses, major project and Lab courses. The number of hours needed for completion of theory and practical courses as well as the passing rules, grading patterns, question paper pattern, number of students in practical batches, etc shall be as per the recommendations, norms, guidelines and policies of the NEP-2020, UGC, State Government and the SRTM University currently operational. The course structure is supplemented with split up in units and minimum numbers of hours needed for completion of the course, wherever possible. Under the CBCS pattern, students would graduate M.Sc. Computer Network with a minimum number of required credits which includes compulsory credits from core courses, open electives and program specific elective course. All students have to undergo lab / practical activities leading to specific credits and project development activity as a part of professional UG program.

FY and SY credit patterns

PEO, PO and CO Mappings

1. **Program Name** : M.Sc.(CN) Campus { SCS-S-MSCA-PG (13-2-1-02)}

2. **Program Educational Objectives**: After completion of this program, the graduates / students would

PEO I :Technical Expertise	Implement fundamental domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logical reasoning.
PEO II : Successful Career	Deliver professional services with updated technologies in computational science based career.
PEO III :Hands on Technology and Professional experience	Develop leadership skills and incorporate ethics, team work with effective communication & time management in the profession.
PEO IV :Interdisciplinary and Life Long Learning	Undergo higher studies, certifications and research programs as per market needs.

3. Program Outcome(s): Students / graduates will be able to

PO1: Apply knowledge of mathematics, science and algorithm in solving Computer problems.

PO2: Generate solutions by understanding underlying computer application environment

PO3: Design component, or processes to meet the needs within realistic constraints.

PO4: Identify, formulate, and solve problems using computational temperaments.

PO5: Comprehend professional and ethical responsibility in computing profession.

PO6: Express effective communication skills.

PO7: Recognize the need for interdisciplinary, and an ability to engage in life-long learning.

PO8: Actual hands on technology to understand it's working.

PO9: Knowledge of contemporary issues and emerging developments in computing profession.

PO10: Utilize the techniques, skills and modern tools, for actual development process

PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings in actual development work

PO12: Research insights and conduct research in computing environment.

4. **Course Outcome(s):** Every individual course under this program has course objectives and course outcomes (CO). The course objectives rationally match with program educational objectives.

The mapping of PEO, PO and CO is as illustrated below

5. Mapping of PEO& PO and CO

Program Educational Objectives	**Thrust Area**	**Program Outcome**	**Course Outcome**
PEO I	Technical Expertise	PO1,PO2,PO3,PO6	All core courses
PEO II	Successful Career	PO4,PO5,PO11,	All discipline specific electives courses
PEO III	Hands on Technology and Professional experience	PO8,PO10	All Lab courses
PEO IV	Interdisciplinary and Life Long Learning	PO7,PO9,PO12	All open electives and discipline specific electives

The detailed syllabus is as below,

Program Specific Syllabus: Third Semester
M.Sc. Computer Network

Core Courses Code	Title	Remarks Credits
SCCNC-501	Advanced Computer Networks	04
SCCNC-502	Network and Linux Administration	04
SCCNC-503	Advanced Network Programming	04
SCCNCP-501	Lab 7: Linux Admn Lab	01
SCCNCP-502	Lab 8: Net Prog Lab	01
SCCNE-501	**Chose any one** A. Wireless and Mobile Network B. Ad-hoc and Sensor Network C. Server Virtualization D. Network vulnerabilities and Risk management E. Internet of Things F. Subject relevant MOOC (NPTEL / SWAYAM / RUSA sponsored Future Oriented Courses / Other recognized **$$**	03 Theory and 01 Lab **Note:** **$$** with prior consultation with the Director of the School in order to determine relevancy and as per credit policy of the university, credit transfer policy will be adopted
SCCNEP-501	Lab 9: Elective Lab	01
SCCNR-551	Research Project	04

Program Specific Syllabus: Fourth Semester
M.Sc. Computer Network

Core Courses Code	Title	Remarks Credits
SCCNC-551	Network Operating Systems	04
SCCNC-552	Network Analysis and Synthesis	04
SCCNCP-551	Lab 10: NOS Lab	01
SCCNCP-552	Lab 11: NAS Lab	01
SCCNE-551	**Chose any one** A. TCP/IP Technology B. Grid Computing C. Web Applications and Security D. Windows Server Administration E. Cryptography and Network Security F. High Speed Data Communications G. Cloud Computing Tools and Techniques	03 Theory and 01 Lab
SCCNE-551	Lab 12: Elective Lab	01
SVECP -551	Publication Ethics	02
SCCNR-552	Research Project	06

Syllabus Analysis

List of Supportive Courses

Title	Semester
Mathematical Foundations of Computer Science	First Semester

Skill enhancement Courses

Title	Semester
1. Data Analysis using Spreadsheet 2. Advanced Web Technology	First Semester

Domain Specific Streams (one or more courses)

Stream	Title	Semester
Application oriented Programmer	1. Advanced Programming Language Concepts 2. Programming in C and Python 3. Core and Advanced Java Programming 4. Advanced Python Programming 5. Visual Programming Tools 6. Principles of User Interface Design	First Semester to Fourth Semester
Databases and Data Analytics, Data Consultant	1. Data Analysis using Spreadsheet 2. Database Essentials 3. DBMS Programming 4. Database Administration 5. Introduction to Data Science	First Semester to Fourth Semester
Advanced trends in Computer application	1. Mobile Application Development 2. Cloud Computing Tools and Techniques 3. AI and Machine Learning 4. Natural Language Processing 5. Internet of Things 6. Introduction to Cyber Security	First Semester to Fourth Semester
Network Security	1. Information Security System 2. Network vulnerabilities and Risk Mgmt. 3. Web Applications and Security 4. Cryptography and Network Security	First Semester to Fourth Semester
Network Administration and Management	1. Network Analysis and Synthesis 2. Network and Linux Administration 3. Windows Server Administration 4. Advanced Computer Networks	First Semester to Fourth Semester

M. Sc. CN Second Year, Semester III and IV *(Level 6.5) : Teaching Scheme*

Course	Course Code	CourseName	CreditsAssigned per course			TeachingScheme (Hrs/ week) per course	
			Theory	Practical	Total	Theory	Practical
Major	SCCNC-501 to SCCNC-503 and SCCNC-551 to SCCNC-552	All Core Course	04	--	04	04	--
Elective	SCCNE-501 and SCCNE-551	All Elective Courses	03	--	03	03	--
Major Practical	SCCNCP-501 to SCCNCP-502 &SCCNCP-551 to SCCNCP-552	All Core labs	--	01	01	--	02
Elective Practical	SCCNEP-501 and SCCNEP-551	Elective lab	--	01	01	--	02
Research Project	SCCNR-551	Research Project	--	04	--	--	04
Research Project	SCCNR-552	Research Project	--	06	--	--	06
Publication Ethics	SVECP-551	Publication Ethics	02	--		02	--
Total Credits per semester			--	--	**22**	--	--
Total credits per year			--	--	**44**	--	--

M. Sc. CN Second Year , Semester III and IV (Level 6.5) :Examination Scheme

Course Code (2)	CourseName (3)	Theory				Practical		Total Col (6+7) / Col (8+9) (10)
		Continuous Assessment (CA)			ESA			
		Test I (4)	Test II (5)	Avg of (T1+T2)/2 (6)	Total (7)	CA (8)	ESA (9)	
SCCNC-501 to SCCNC-503 and SCCNC-551 to SCCNC-552	All core courses	20	20	`20	80	--	--	100
SCCNE-501 and SCCNE-551	All elective courses	15	15	15	60	--	--	75
SCCNCP-501 to SCCNCP-502 &SCCNCP-551 to SCCNCP-552	All Core Labs	--	--	--	--	05	20	25
SCCNEP-501 and SCCNEP-551	All Elective labs	--	--	--	--	05	20	25
*SVECP-551	Publication Ethics	As per University Policy						
*SCCNR-551	Research Project	As per University Policy						
*SCCNR-552	Research Project	As per University Policy						

***Note : Teaching scheme and Examination scheme for these courses will be elaborated later**

Guidelines for Course Assessment: M.Sc. CN

A. Continuous Assessment (CA) (20% of the Maximum Marks): This will form 20% of the Maximum Marks and will be carried out throughout the semester. It may be done by conducting **Two Tests** (Test I on 40% curriculum) and **Test II** (remaining 40% syllabus). Average of the marks scored by a student in these two tests of the theory paper will make his **CA** score (col. 6).

B. End Semester Assessment (80% of the Maximum Marks): ***(For illustration we have considered a paper of 04 credits, 100 marks and need to be modified depending upon credits of an individual paper)***

1. **ESA Question paper will consists of 6 questions, each of 20 marks.**
2. **Students are required to solve a total of 4 Questions.**
3. **Question No.1 will be compulsory and shall be based on entire syllabus.**
4. Students need to solve **ANY THREE** of the remaining Five Questions (Q.2 to Q.6) and shall be based on entire syllabus.

C. Question paper of campus and affiliated colleges shall be different

Note:Number of lectures required to cover syllabus of a course depends on the number of credits assigned to a particular course. One credit of theory corresponds to 15 Hours lecturing and for practical course one credit corresponds to 30 Hours. For example, for a course of two credits 30 lectures of one hour duration are assigned, while that for a three credit course 45 lectures.

%%%%%