School of Arts and Science

Department of Computational Studies

Minutes of Board of Studies Meeting for B.C.A

The Second meeting of Board of Studies for the course Bachelor of Computer Applications in the Department of Computational Studies was held on 12.04.2021 at 10:00 A.M in the Department of Computational Studies, School of Arts and Science, Sri Manakula Vinayagar Engineering College and also through online with the Head of the Department in the Chair.

The following members were present for the Second Meeting of Board of Studies.

S. No.	Name of the Member with Designation and official Address	Responsibility in the BoS
1	Mr. M. SHANMUGAM,M.Sc.,M.Phil.,M.E.,SET, (Ph.D) Assoc. Prof. and Head, Department of Computational Studies, School of Arts and Science, SMVEC	Chairman
2	Dr. N. VIJAYALAKSHMI, M.C.A., Ph.D. Associate Prof, Department of Computer Science, SRM Institute of Science and Technology(Autonomous) email: vijinatarajan23@gmail.com Mobile: 9941202829,	University Nominee
3	Dr. A. MARTIN, M.C.A., M.Phil., M.E., Ph.D. Asst. Prof, Department of Computer Science, School of Mathematics and Computer Science, Central University of Tamil Nadu, Thiruvarur. email:martin@cutn.ac.in Mobile: 8903756380,	Subject Expert (Academic Council Nominee)
4	Dr. S. BEHIN SAM, M.Sc., M.Tech., Ph.D. Associate Prof, Department of Computer Science, Dr. Ambedkar Arts and Science College, Viyasarpadi, Chennai. email:behinsam@gmail.com Mobile: 9176667525,	Subject Expert (Academic Council Nominee)
5	Mr. C. VIMAL RAJ, B.Tech., Systems Architect, TCS, Chennai. Email: vimal06vishwa@gmail.com Mobile: 9952578333	Industry Expert
6	Dr. P. AURCHANA, M.C.A., M.Tech., Ph.D. Associate Professor, Department of MCA, SMVEC. Email: aurchanamca@smvec.ac.in Mobile: 7603855239	Internal member
7	Mr. R. RAMAKRISHNAN, M.C.A.,M.Phil., M.Tech., (Ph.D) Associate Professor, Dept. of MCA, SMVEC, E-mail:ramakrishnanmca@smvec.ac.in Mobile:9843797091	Internal member
8	Mr. P. KRISHNAMOORTHY, M.Sc., M.Phil., B.Ed. Assistant Professor, Department of Mathematics, School of Arts and Science, SMVEC krishnamat14@gmail.com Cell: 9750028056	Internal member

Agenda of the Meeting

2.1) Confirmation of minutes of 1st meeting of Board of Studies and modifications made.
2.2) To discuss about the Regulations 2020 (R-2020) of Bachelor of Computer Applications.
2.3) Discuss about the Vision and Mission of the Department of Computational Studies.
2.4) To discuss and approve the Academic Calendar for the Odd semester (2021 – 2021).
2.5) Discussion about the Curriculum Structure of Bachelor of Computer Applications.
2.6) To discuss and approve the Syllabi of III and IV semesters for the B.C.A and the students admitted in the Academic Year 2020-21. (First Year).
2.7) To discuss about the uniqueness of the Curriculum (R-2020).
2.8) To discuss and approve Evaluation Systems.
2.9) To discuss about the Innovative Teaching / Practices Methodology adopted to handle the emerging / Advanced Technological concept courses.
2.10) To discuss about the Panel of examiners and to approve for the Academic Council.
2.11) Any other item with the permission of chair.

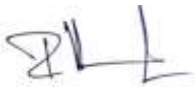
Minutes of the Meeting

Mr. M. Shanmugam, Chairman, BoS opened the meeting by welcoming and introducing the external members, to the internal members and the meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Item:1	Chairman, BoS, appraised the minutes of 1st meeting of BoS, its implementation and then it is confirmed with the approval for the incorporation of minor revisions needed as mentioned below. a) We can combine Data Structure and Algorithms courses as a single course in Semester – II. **The above corrections are approved by BoS members and the details are given in Annexure- I.**
Item:2	Feedback about the Regulations of 2021 (R-2020). Experts have suggested for providing some age relaxation for the Physically challenged people like SC/ST candidates. **The above updation will be considered while revising the regulation in the next time.**
Item:3	The Vision, Mission of Department of Computational Studies are revised, have been presented in the 2nd meeting of BoS. It was approved by BoS members and given in **Annexure- II**.
Item:4	The Academic Calendar for the Odd Semester of Academic year 2020-21(given in **Annexure-III**) were discussed and approved.
Item:5	Curriculum Structure was discussed and recommended to Academic Council. The following modifications are recommended by the BoS Experts. a) In Discipline Specific Elective subjects, it is recommended to include “Client / Server Technology”, “Data Mining”, “R Programming”, “Hadoop for Data Science” and “MATLAB for Data Visualization” subjects. **The above corrections have been made in the curriculum and the details are given in Annexure- IV.**
Item:6	Syllabus for Semester-III and Semester – IV were discussed and recommended to Academic Council. The following modifications are recommended by the BoS Experts. a) In Semester-III, in Operating System course, eliminate all the case study from all the units. Because the syllabus is heavy for the UG students. b) In the same course, include some I/O base Linux concepts.

	c) In Operating Systems Lab, eliminate the Multithreading concepts and also reduce the shell programming and increase Operating System concepts. d) In Python Programming Lab, only 10 to 12 exercises are enough. e) In Object Oriented Analysis and Design (DSE), the content of the syllabus must be reduced according to diagram specific. f) In Software Project Management (DSE), reduce the content of all the units. g) In Semester IV, in Database Management Systems course, eliminate Unit – V and move the Transactions Topics to Unit – V. h) In Computer Network Subject, reduce the "Routing Algorithms" concepts. i) Move the "Computer Graphics and Multimedia" course to DSE and bring the "Software Engineering" course as the DSC in Semester-IV. j) In Computer Networks Lab course, try to conduct first 8 exercises using JAVA and remaining programs in CISCO models. **The above corrections have been made in the curriculum and the details are given in Annexure-V**
Item:7	The uniqueness of the curriculum was discussed and accepted by BoS Members. Employability Enhancement Course for Semester-I to Semester-II are listed below: Semester-I => Web Programming Semester-II => Java Programming Semester-III => Python Programming Semester-IV => Mobile Application Development / RDBMS Semester-V => IOT Semester-VI => Data Science / Machine Learning
Item:8	Evaluation system was discussed and accepted by BoS experts.
Item:9	Discussed about Innovative Teaching / Practices Methodology adopted to handle the emerging / advanced technologies and experts have appreciated it.
Item:10	Panel of Examiners also was discussed and recommended to Academic Council.
Item:11	Discussion of the Opportunities for B. C. A.

S. No.	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1	Mr. M. SHANMUGAM,M.Sc.,M.Phil.,M.E.,SET, (Ph.D) Assoc. Prof. and Head, Department of Computational Studies, School of Arts and Science, SMVEC	Chairman	
2	Dr. N. VIJAYALAKSHMI, M.C.A., Ph.D. Associate Prof, Department of Computer Science, SRM Institute of Science and Technology(Autonomous) email: vijinatarajan23@gmail.com Mobile: 9941202829,	University Nominee	
3	Dr. A. MARTIN, M.C.A., M.Phil., M.E., Ph.D. Asst. Prof, Department of Computer Science, School of Mathematics and Computer Science, Central University of Tamil Nadu, Thiruvarur. email:martin@cutn.ac.in Mobile: 8903756380,	Subject Expert (Academic Council Nominee)	
4	Dr. S. BEHIN SAM, M.Sc., M.Tech., Ph.D. Associate Prof, Department of Computer Science, Dr. Ambedkar Arts and Science College, Viyasarpadi, Chennai. email:behinsam@gmail.com Mobile: 9176667525,	Subject Expert (Academic Council Nominee)	

5	Mr. C. VIMAL RAJ, B.Tech., Systems Architect, TCS, Chennai. Email:vimalraj_c@gmail.com Mobile: 9952578333	Industry Expert	
6	Dr. P. AURCHANA, M.C.A., M.Tech., Ph.D. Associate Professor, Department of MCA, SMVEC. Email: aurchanamca@smvec.ac.in Mobile: 7603855239	Internal member	
7	Mr. R. RAMAKRISHNAN, M.C.A.,M.Phil., M.Tech., (Ph.D) Associate Professor, Dept. of MCA, SMVEC, E-mail:ramakrishnanmca@smvec.ac.in Mobile:9843797091	Internal member	
8	Mr. P. KRISHNAMOORTHY, M.Sc., M.Phil., B.Ed. Assistant Professor, Department of Mathematics, School of Arts and Science, SMVEC krishnamat14@gmail.com Cell: 9750028056	Internal member	

The meeting was concluded at 12:00 PM with vote of thanks by **Mr. M. Shanmugam**, Head of the Department, Department of Computational Studies.

Annexure – I

		L	T	P	C	Hrs
A20CAT203	**DATA STRUCTURES AND ALGORITHMS**					
	(Common to B.Sc. CS and B.C.A.)	**4**	**0**	**0**	**4**	**60**

Course Objectives

- To introduce the primary data structures and algorithms for their associated operations.
- To understand the applications of data structures.
- To learn the implementation issues of the data structures introduced.
- To understand the concepts of searching and sorting Techniques.
- To understand the basic concepts of stack, queue, List, Trees and Graphs

Course Outcomes

After completion of the course, the students will be able to

CO1 – Analyze algorithms based on time and space complexity.
CO2 – Implement and Apply linear data structures to solve simple problems.
CO3 – Represent and Apply Non-linear data structures to solve complex problems.
CO4 – Use Divide and conquer method to solve various problems.
CO5 – Use Greedy techniques to solve real time problem.

UNIT I INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS (12 Hrs)

Types of data structures - Abstract Data Type (ADT) - Analysis of algorithm - Time and space complexity - Recurrence relation - Asymptotic notation. Sorting - Searching.

UNIT II LIST AND ADT (12 Hrs)

Static and dynamic Representation – Types -Single Linked List-Doubly Linked List – Circular Linked List – Operations and Applications.

UNIT III STACK ADT (12 Hrs)

Static and Dynamic Representation – Operations - Applications- Balancing Parenthesis- Evaluation of Arithmetic Expression- Infix to Postfix conversion. Queue ADT: Static and dynamic Representation – Linear queue — circular queue.

UNIT IV TREE ADT (12 Hrs)

Representation – Types - Binary Tree- Threaded Binary Tree -Binary Search Tree -Operation and Application. Graph: Representation — Types -Graph Traversal– Depth First Search - Breadth First Search –Application - Minimum cost spanning tree-Topological Sorting.

UNIT V ALGORITHM DESIGN TECHNIQUES (12 Hrs)

Divide and Conquer - General method – Finding Minimum Maximum – Merge Sorting - Greedy Method: General Method – knapsack problem – Single source shortest path – Dijkstras: Job sequencing.

Text Books

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, 4th Edition, Pearson Education, 2013.
2. E. Horowitz, S. Sahni and S. Rajasekaran, “Computer Algorithms/C++”, Second Edition, The OrientBlackswan,2019.
3. A Puntambekar, “Data Structures”, 3rd Revised Edition, Technical Publications Pune, 2008.

Reference Books

1. ReemaThareja, “Data Structures Using C”, Edition, Oxford University Press, 2017.
2. Gilles Brassard, “Fundamentals of Algorithms”, Pearson Education, 2015.

3. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, “Data Structures and Algorithms”, Pearson Education,Reprint, 2006.
4. Ellis Horowitz, SartajSahni, Susan Anderson-Freed, “Fundamentals of Data Structures in C”, 2rd Edition,University Press, 2008.

Web References

1. https://www.geeksforgeeks.org/
2. http://opendatastructures.org/
3. https://nptel.ac.in/courses/106/106/106106127

(Annexure – II)

DEPARTMENT OF COMPUTATIONAL STUDIES

VISION AND MISSION

Vision:

To come up with successfully as a high-quality human capital in Computer Science and related areas forthe sustainable growth of the IT industry needs of the country.

Mission:

M1: Innovative Skills:

Ensuring deeper understanding of fundamentals and acquiring innovative skills within core areas of Computer Science.

M2: Motivated Graduates:

Producing highly skilled and motivated graduates with the ability of problem solving individually and in teams.

M3: Ethical Responsibilities:

Providing a deep awareness of our ethical responsibilities to our profession and to the society.

(Annexure – III)

Use of Cell Phones

It has been decided not to permit cell phones inside the college campus. If any student is found using the cell phone inside the college campus, it would be confiscated and will not be returned back on any circumstances. Hence the students are instructed not to attend the college with the mobile phones.

Dress Code

The students are requested to attend the college neatly dressed. While the male students should attend the college with the shirts neatly tucked in and with the shoes, the female students are permitted to come with churidar and dupatta properly pined. Students wearing full hand shirts should wear it as such without folding it to half etc. Casual wears like jeans, T-shirts etc., both for boys and girls are strictly prohibited inside the campus. Each department has prescribed uniforms for the labs. The students are requested to strictly adhere to the dress codes as well as the rules and regulations of the college.

Maintenance of Discipline

Discipline is an important factor that shapes one's personality. It is considered as a golden key capable of opening many doors. This institution expects each and every student to follow the rules and regulations in total. Maintaining discipline in the campus will promote a conducive environment for studies.

Working hours

I hr	8.45	to	9.35
II hr	9.35	to	10.25
III hr	10.25	to	11.15
Break	11.15	to	11.30
IV hr	11.30	to	12.20
V hr	12.20	to	1.10
VI hr	1.50	to	2.40
VII hr	2.40	to	3.30
VIII hr	3.30	to	4.20
Lunch break	1.10 p.m.	to	1.50 p.m.

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Accredited by NBA-AICTE, New Delhi and Accredited by NAAC with 'A' Grade)

Madagadipet, Puducherry - 605 107

SCHOOL OF ARTS AND SCIENCE

Academic Calendar

December 2020 to May 2021

Name :
Department :
Course :
Year / Sem : *I year / I semester*
Class / Sec :

நீங்கள்

About Autonomous

Sri Manakula Vinayagar Engineering College (SMVEC) has been conferred with Autonomous Status by the University Grants Commission on 26th September 2019 and the same was approved by Pondicherry University on 19th June 2020. The School of Arts and Science (SAS) is a new initiative of SMVEC during the academic year -2020 - 21. SAS provides eleven Under Graduate Programmes (B.Com., B.Com. Corporate Secretaryship, B.B.A., B.Sc. Computer Science, B.C.A., B.Sc. Physics, B.Sc. Chemistry, B.Sc. Mathematics, B.A. English, B.Sc. Visual Communication, B.A. Journalism & Mass Communication) follow Regulations 2020-21.

HIGHLIGHTS OF SMVEC AUTONOMOUS REGULATIONS 2020

- Industry 4.0 ready curriculum
- Updated towards skill development to create more job opportunities
- Multidisciplinary curriculum
- More entrepreneurship opportunities
- IELTS model curriculum / Foreign Languages learning opportunities
- Department wise Gold Medals
- Declaration of results within a month after completion of examinations
- **EEC / Mandatory course**

  The Institute has Established 17 Centers of Excellence to provide 75 International Certification courses from IBM, Google, Cisco, E Plan, Microsoft, Autodesk, Texas instruments, Festo, Bentley, Schneider Electric, Amazon web services, Siemens, Tally, DELL EMC², Harita Techserv, PTC, LN an Excellence in Technology & Didactic solutions. All the students should enroll in one of the certification course in every semester

- **Industrial Training / Internship**

  Students may undergo training or internship during summer / winter vacation at Industry/ Research organization. students are also permitted to undergo internships during their eighth semester after the theory classes are over

May 2021

Date	Day	Schedule	Working day/ Holiday
1	Sat		Holiday
2	Sun		Holiday
3	Mon	Submission of student assesment record	
4	Tue		
5	Wed		
6	Thu	ESE - Theory examination starts	
7	Fri		
8	Sat		
9	Sun		Holiday
10	Mon		
11	Tue		
12	Wed		
13	Thu		
14	Fri		
15	Sat		
16	Sun		Holiday
17	Mon		
18	Tue		
19	Wed		
20	Thu		
21	Fri		
22	Sat		
23	Sun		Holiday
24	Mon		
25	Tue		
26	Wed		
27	Thu		
28	Fri		
29	Sat		
30	Sun		Holiday
31	Mon		

Total number of working days :
Total number of holiday :

வெற்றி என்பது, லட்சியத்தைப் படிப்படியாகப் புரிந்து கொள்வது – நைட்டிங்கேல்

April 2021

Date	Day	Schedule	Working day/ Holiday
1	Thu	Submission of CAT-III question papers / Submission of student assesment record	60
2	Fri	Good Friday	Holiday
3	Sat	Syllabus completion	61
4	Sun		Holiday
5	Mon	CAT-III starts	62
6	Tue		63
7	Wed		64
8	Thu		65
9	Fri	BOS-(Dept. of Chemistry, Computational Studies, Comm. & Mgt. - BBA, Dept. of Media studies - Viscom)	66
10	Sat	CAT-III ends/BOS-(Dept of Media Studies, Journalism & Mass Communication	67
11	Sun		Holiday
12	Mon	Departmentwise QCM-3/BOS (Dept. of Physics, English)	68
13	Tue	Submission of CAT-III mark registers	69
14	Wed	Tamil New Year / Dr. Ambedkar Jayanthi	Holiday
15	Thu	Model practical exams	70
16	Fri	Model practical exams	71
17	Sat	Model practical exams	72
18	Sun		Holiday
19	Mon	End semester practical exams	73
20	Tue	End semester practical exams	74
21	Wed	Academic audit	75
22	Thu		76
23	Fri		77
24	Sat		78
25	Sun		Holiday
26	Mon	Model exam starts	79
27	Tue		80
28	Wed		81
29	Thu		82
30	Fri	Model exam ends / Last working day	83

Total number of working days : 03
Total number of holiday : 05

அன்றாட வாழ்வின் சாதாரண விஷயங்களையும், அசாதாரண முறையில் செய்யும்போது உலகின் கவனத்தை உன் மீது திருப்ப முடியும். - ஜார்ஜ்வாஷிங்டன்கார்வர்

❖ **Supplementary Examinations**

Supplementary examination is an additional examination conducted within a month of time after declaring the results. In order to complete the program within 3 years, only the student with maximum of two arrears will be permitted to appear for supplementary examination.

Benefits

- ❖ More number of students will receive the degree within the stipulated time
- ❖ The industries prefers to recruit students having nil arrears. If the supplementary examinations are conducted, then more number of students will be eligible for the recruitment.

❖ **Photo copy of answer book**

After the publication of the result, photocopy of the answer books shall be provided to the student on request with stipulated fee fixed by the College from time to time

Punctuality in Attendance

The students are requested to keep up punctuality in attending the college. The late comers will be losing their attendance and in turn the internal marks. Hence all the students are requested to attend the college in time. A student shall be permitted to appear for the End Semester Examination at the end of the semester only if he / she **secures not less than 75% of overall attendance.**

Repeating the Course

A student who secures overall attendance which is less than 60% has to repeat the course with the approval, when it is next offered.

Tutor Ward System

In the tutor ward system, 30 students are allotted to a tutor who will be taking care of these students. The students are requested to utilize the facility.

The internal marks will be provided fully based on the continuous assessment tests (CAT 1 to 3 and Model examinations)

Marks Distribution of Continuous Assessment Marks (CAM) and End Semester Examination Marks (ESM)

Scheme for Continuous Assessment Test

S. No	Course Type	Continuous Assessment components									
		Test Marks	Average of marks for project/ field/ viva for each experiment	Average of marks for experiment report for each experiment	Model Exam / Report	Assignment	Review - 1	Review - 2	Review - 3	Attendance	Total Marks
1.	Theory	15	-	-	-	5	-	-	-	5	25
2.	Practical	-	10	15	15	-	-	-	-	10	50
3.	Project work	-	-	-	-	-	10	10	20	-	40

Question Paper Pattern

Question paper pattern for CAT and ESE will be based on the patterns shown in Table (a) and (b)

Table (a) Question Paper pattern for CAT / Model exam

Test Type	2 Marks	5 Marks	10 Marks	Total Marks
CAT 1 to 3	5	4	2 (open choice)	50
Model exam	End semester Examination Question Pattern			75

Table (b) Question paper patterns for End semester Examination (ESE)

2 Marks	5 Marks	10 Marks	Total Marks
10	5 (one question from each unit)	3 (out of 5) (open choice)	75

March 2021

Date	Day	Schedule	Working day/ Holiday
1	Mon	Submission of student assesment record	33
2	Tue		34
3	Wed		35
4	Thu		36
5	Fri		37
6	Sat		38
7	Sun		Holiday
8	Mon		39
9	Tue		40
10	Wed	Submission of CAT-II question papers	41
11	Thu		42
12	Fri	Departmentwise QCM - 2	43
13	Sat		44
14	Sun		Holiday
15	Mon	CAT - II starts	45
16	Tue		46
17	Wed		47
18	Thu		48
19	Fri		49
20	Sat	CAT - II ends	50
21	Sun		Holiday
22	Mon		51
23	Tue		52
24	Wed	Submission of CAT-II Mark registers / 17th IQAC meeting	53
25	Thu		54
26	Fri		55
27	Sat		56
28	Sun		Holiday
29	Mon		57
30	Tue	BOS (Dept of Commerce & Management-BCom)	58
31	Wed	BOS (Dept of Mathematics, Commerce & Management-BCom(CS)	59

Total number of working days : 27
Total number of holiday : 04

உலகை வெல்வதற்கு, உலகை தெரிந்து கொள்வது முக்கியமல்ல,
உன்னை அறிந்து கொள்வதுதான் முக்கியம் . . .

February 2021

Date	Day	Schedule	Working day/ Holiday
1	Mon	Commencement of regular offline classes	10
2	Tue		11
3	Wed		12
4	Thu		13
5	Fri		14
6	Sat		Holiday
7	Sun		Holiday
8	Mon		15
9	Tue		16
10	Wed	Submission of CAT-I question papers	17
11	Thu		18
12	Fri	Departmentwise QCM - 1	19
13	Sat	Motivational programme	20
14	Sun		Holiday
15	Mon	CAT - I starts	21
16	Tue		22
17	Wed		23
18	Thu		24
19	Fri		25
20	Sat	CAT - I ends / Guest lecture - Dept of Com. & Mgt., Dept. of Computational Studies	26
21	Sun		Holiday
22	Mon	Ulaga Thaimozhi Thinam- Dept of Tamil	27
23	Tue		28
24	Wed	Submission of CAT-1 Mark registers / ICARMS 2021 - Dept. of Mathematics	29
25	Thu	Remedial classes start	30
26	Fri		31
27	Sat	Budget meet by Dept of Com. & Mgt.	32
28	Sun		Holiday

Total number of working days : 23
Total number of holidays : 05

தவறாத இதயம் உள்ளவனுக்கு, இவ்வுலகில் முடியாதது என்று எதுவுமே இல்லை – புக்கன்ஸ்

Distribution of Attendance marks for theory : 5 marks

The distribution of 5 marks for theory class attendance is as follows :
5 marks for 95% attendance and above
4 marks for 90% attendance and above but below 95%
3 marks for 85% attendance and above but below 90%
2 marks for 80% attendance and above but below 85%
1 mark for 75% attendance and above but below 80%

Distribution of Attendance marks for practical : 10 marks

The distribution of 10 marks for practical class attendance is as follows :
10 marks for 95% attendance and above
8 marks for 90% attendance and above but below 95%
6 marks for 85% attendance and above but below 90%
4 marks for 80% attendance and above but below 85%
2 marks for 75% attendance and above but below 80%

Note :

Students should not be absent for the classes. Attendance for the classes are monitored regularly and recorded. Continuous assessment mark will be based on the performance of the students in the continuous assessment test, Assignments and attendance percentage.

Assignments

Out of 25 (continuous assessment marks), 5 Marks will be awarded for the assignment. The students have to submit 3 assignments in each subject. The assignment questions will be different for each and every student.

Importance of Continuous Assessment marks

The continuous assessment marks once earned are carried over to the subsequent exams also. Hence the students are requested to work hard to get the maximum of the continous assessment marks. If the continous assessment marks are lower, it will pull down chances of getting the first class, distinction, gold medals and ranks.

Importance of CAT-I/CAT-II/CAT-III/Model exam

Continous assessment marks are awarded for the performance in the CAT-I, CAT-II, CAT-II, CAT-III & Model exam. Hence all the students are requested to prepare well for each test / examination to earn the maximum continuous assessment marks.

Undertaking Minor / Major Projects

Each student is advised to take atleast one minor project. Involving in the project will be helping to understand the basics of the subject. Some of the minor / major project will also be benefiting the society. Moreover, the Management awards cash prizes for the best projects in each department.

Participation in the Curricular / Co-curricular / Extra curricular Activities

All the students are encouraged to participate in the curricular / co-curricular / extra curricular activities. Involvement in these activities will improve their knowledge level in the subject. If a student or a team gets cash prize / award at the technical event organised by the recognised institutions, then the management of this institution will also sanction an amount equivalent to the award / cash prize as a token of appreciation.

Leave Account Record

For each student, leave account record has been provided. The students are instructed to show the leave record to their parents and strictly adhere to the instructions given for availing the leave. The leave account record should be maintained properly and prior approval must be obtained for availing the leave. In exceptional cases, the students are permitted to get the approval after availing the leave.

Transport Facility

56 buses have been arranged for the students to reach the college from Puducherry, Kanagachettikulam, Villupuram, Neyveli, Panruti, Cuddalore, Nellikuppam, Madukarai and Tindivanam covering almost all the areas. Separate transport facility has been arranged for the students who remain in the college after 5 p.m. for utilising computer lab, library and sports facilities. The students are requested to utilise the transport facility.

All the students are requested to avoid mobile phones and avoid travel by two wheelers considering their safety and security.

January 2021

Date	Day	Schedule	Working day/ Holiday
1	Fri		Holiday
2	Sat		Holiday
3	Sun		Holiday
4	Mon	Online / Offline class starts	20
5	Tue		21
6	Wed		22
7	Thu		23
8	Fri		24
9	Sat		25
10	Sun		Holiday
11	Mon		26
12	Tue		27
13	Wed		Holiday
14	Thu		Holiday
15	Fri		Holiday
16	Sat		Holiday
17	Sun		Holiday
18	Mon		28
19	Tue	Online class ends	29
20	Wed	SAS Inauguration / Induction day	1
21	Thu		2
22	Fri		3
23	Sat	Mupperum Vizha - Departments of Tamil, English & Media Studies	4
24	Sun		Holiday
25	Mon		5
26	Tue	Republic day	Holiday
27	Wed		6
28	Thu		7
29	Fri		8
30	Sat		9
31	Sun		Holiday

Total number of working days : 19
Total number of holidays : 12

நீ வெற்றியடைவதை உன்னைத் தவிர, வேறு யாராலும் தடுக்க முடியாது – ப்ளாம்

December 2020

Date	Day	Schedule	Working day/ Holiday
1	Tue		
2	Wed		
3	Thu		
4	Fri		
5	Sat		
6	Sun		Holiday
7	Mon	Online class starts	1
8	Tue		2
9	Wed		3
10	Thu		4
11	Fri		5
12	Sat		Holiday
13	Sun		Holiday
14	Mon		6
15	Tue		7
16	Wed		8
17	Thu		9
18	Fri		10
19	Sat		Holiday
20	Sun		Holiday
21	Mon		11
22	Tue		12
23	Wed	17th IQAC meeting	13
24	Thu		14
25	Fri		15
26	Sat		Holiday
27	Sun		Holiday
28	Mon		16
29	Tue		17
30	Wed		18
31	Thu		19

Total number of working days : 19
Total number of holiday : 06

நீ வெற்றியடைவதை உன்னைத் தவிர, வேறு யாராலும் தடுக்க முடியாது – ப்ளூமர்

Placement and Training Division

The placement cell functions round the clock throughout the year to establish contact with reputed multinational companies, well established industrial organizations and plays an important role in locating various job opportunities and placing large number of the students every year at these organizations.

Activities of the Training Division

- Arranges trainings for personality and interpersonal skill development.
- Assists the students to get in-plant training
- Arranges industrial visits
- Creates awareness on the opportunities open for higher studies.
- Arranges coaching classes for GATE, GRE, TOFEL, IELTS, IAS, IES etc.

Placement Record

Academic Year	Students Placed
2012-13	75%
2013-14	85%
2014-15	95%
2015-16	95%
2016-17	93%
2017-18	95%
2018-19	95%
2019-20	95%

Details of Placed Students : 2020 - 21

1 Kaar	9	12 Makolet	3
2 TCS(Ninja and Digital)	210	13 O2Saver	4
3 Hexaware	15	14 OPPO Mobiles	3
4 Yellow Messanger	4	15 Infosys	1
5 Unisys	1	16 Sutherland	56
6 EmbedUr	1		
7 Virtusa	3		
8 ZOHO	8		
9 CTS	101		
10 Milekel Engineering	1		
11 Mantec Electronic	1	Total	*421

*till 31st January 2021

Wi-Fi Campus

Our campus has been enabled by high speed uninterrupted Wi-Fi connectivity. The Computer Centre is open till 8.00 p.m. on all the working days except on the dates of University examinations.

Library Working Hours

8.30 a.m. to 8.30 p.m. (On all the working days)
8.30 a.m. to 10.00 p.m. (During the examination days)

Women Cell

For the benefit of the girl students, a Women Cell has been constituted in the college. The girl students may approach the Chairperson / members for assistance.

Grievance Redressal Cell

There is a Grievance Redressal Cell under the Chairmanship of the Director of the institution. Students are requested to approach the Chairman / members to redress their grievances. Mail ID : grievance@smvec.ac.in

Gold Medals and Top Ten Ranks

Your seniors were sincere, hard working and got the Gold medals of the Pondicherry University and the top ten ranks in all the branches. The details of the University Goldmedals and Top Ten Ranks won by the students are given below.

Indicates the Gold medal and University First Rank.

The Management awards 3 sovereigns of gold to the 1st rank holder, 2 sovereigns to the 2nd rank holder, 1 sovereign to the 3rd rank holder, 4th and 5th rank holders shall receive a cash award of Rs. 10,000/- (Rupees ten thousand) each and 6th to 10th rank holders shall receive a cash award of Rs. 5,000/- (Rupees five thousand) each.

Name of the Course	Year		
	2017	2018	2019
BTech EEE	2, 4, 6, 7		2,3,4,6,7,8,9,10
BTech ECE	2,3,4,5,6,7,8,9,10		,3,4,5,6,7,9,10
BTech CSE	,2, 3, 4, 10		,2,4,6,7,8,10
BTech IT	,2,3,4,5,6,7,8,9,10		2,3,5,6,8
BTech ICE	,2,3,4,5,6,7,8,9,10		2,3,4,5,6,7,8,9,10
BTech Mech	,4, 5, 7, 9, 10		3,7,8,10
BTech Civil	2, 3, 10		2,3,4,6,7,10
MCA	3,4,7,9,10		2,6,7,8,9,10,11
MBA	3,4,6,7,8		2,3,4,5,7,8,10
MTech CSE	2, 3, 4, 5, 7, 8, 9		,7
MTech ECE	2, 3, 6, 7, 8, 9		2,3,4,5
MTech PED			2,3
MTech NW	2, 3, 4, 5, 7, 8, 9		2,3
MTech(VLSI)			,2,3,4
MTech(MF)	,2		

Important points for the kind attention of the Parents

Dear Parent

The I semester classes commence on 7th December 2020. The students have to complete a lot of work within a short period. **Hence the parents are kindly requested not to permit their wards to avail frequent leave during this semester period for the following reasons.**

It is compulsory for all the students to complete Six Certificate Courses, Nine Skill Development Courses and Eight Mandatory Courses along with their Academic Courses. These courses will enhance the students to upgrade their required skills to cope up with the Industry.

Marks in the **continuous assessment test** decide the major part of the continous assessment marks. So, availing leave for the continuous assessment test must be avoided at any cost as this would seriously affect the assessment marks.

Practicals are very important not only to score more marks but also it will help to understand the theory part of the subject, hence advice your ward not to cut the practical classes.

Please spare your **valuable time to talk to your son/daughter every day and try to understand what he/she is doing in respect of his/her studies.** Kindly extend all your support to your son/daughter which will help them to come out successfully. For any assistance from our side you may always feel free to contact the respective HOD / DEAN any time during the working hours.

(Annexure – IV)

DISCIPLINE SPECIFIC ELECTIVE COURSES

DISCIPLINE SPECIFIC ELECTIVES										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Discipline Specific Electives (DSE - I) - offered in Third Semester										
1	A20CPE301	Software Management	DSE	3	0	0	3	25	75	100
2	A20CPE302	Object Oriented Analysis and Design	DSE	3	0	0	3	25	75	100
3	A20CPE303	Client / Server Technology	DSE	3	0	0	3	25	75	100
4	A20CPE304	Data Mining	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - II) - offered in Fourth Semester										
1	A20CPE404	Hadoop for Data Science	DSE	3	0	0	3	25	75	100
2	A20CPE405	Data Science using R	DSE	3	0	0	3	25	75	100
3	A20CPE406	Data Visualization using MATLAB	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - III) - offered in Fifth Semester										
1	A20CPE507	Information Security	DSE	3	0	0	3	25	75	100
2	A20CPE508	Network Security	DSE	3	0	0	3	25	75	100
3	A20CPE509	Ethical Hacking	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - IV) - offered in Sixth Semester										
1	A20CPE610	IT Assessment and Risk Analysis	DSE	3	0	0	3	25	75	100
2	A20CPE611	Intrusion Detection System and Prevention	DSE	3	0	0	3	25	75	100
3	A20CPE612	Introduction to Data Science and Machine Learning	DSE	3	0	0	3	25	75	100

(Annexure – V)

(In Semester-III, in Operating System course, eliminate all the case study from all the units.

In the same course, include some I/O base Linux concepts.)

		L	T	P	C	Hrs
A20CAT305	**OPERATING SYSTEMS**	**4**	**0**	**0**	**4**	**60**

Course Objectives

- To grasp a fundamental understanding of operating systems and processes
- To learn the concepts of CPU scheduling and deadlock
- To understand synchronization and memory management concepts in OS
- Understand the concepts of file systems and secondary storage structure
- To learn the features of commercial operating systems

Course Outcomes

After completion of the course, the students will be able to

CO1 - Define the concepts of operating systems operations, processes and threads.
CO2 - Apply the concepts of CPU scheduling and deadlock techniques.
CO3 - Simulate the principles of memory management.
CO4 - Identify appropriate file system and disk organizations for a variety of computing scenario.
CO5 - Examine the features of various open source operating systems.

UNIT I INTRODUCTION AND PROCESS MANAGEMENT (12Hrs)

Operating system structure – Operating system operations – Process management – Memory management – Storage management – Protection and Security – System structures: Operating system services – System calls – Types of system calls – System programs. Process scheduling – Operations on processes – Inter-process communication.

UNIT II CPU SCHEDULING AND DEADLOCK (12Hrs)

Overview of threads – Multithreading models – Threading issues – Basic concepts of process scheduling – Scheduling criteria – Scheduling algorithms – Multiple processor scheduling, Dead Lock: Characterization – Prevention Detection – Avoidance and Recovery.

UNIT III CONCURRENT PROCESSES AND MEMORY MANAGEMENT (12Hrs)

Process synchronization: The Critical Section Problem – Peterson's solution – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Monitors. Memory Management: Swapping – Contiguous memory allocation – Paging – Structure of the Page Table – Segmentation, Demand Paging – Page Replacement – Allocation of Frames – Thrashing.

UNIT IV FILE SYSTEMS AND SECONDARY STORAGE STRUCTURE (12Hrs)

File Concept – Access Methods – Directory structure – File system mounting – File sharing – Protection – File system structure – File system implementation – Directory Implementation – Allocation methods – Free-space management. Disk structure – Disk Scheduling – Disk Management – Swap-Space management.

UNIT V I/O BASED LINUX (12Hrs)

LINUX System: Basic Concepts – System administration – Requirements for Linux System Administrator – Setting up a LINUX multifunction server – Domain Name System – Setting up local network services.

Text Books

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", John Wiley & Sons Ninth Edition, 2017.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India, 3rd Edition, 2015.
3. Gary Nutt, "Operating Systems - A Modern Perspective", Pearson Education, Second Edition, 2013.

Reference Books

1. William Stallings, "Operating System", Prentice Hall of India, 6th Edition, 2015.
2. Thomas Anderson and Michael Dahlin, "Operating Systems principles and practice", Wiley, 2nd Edition, 2014.
3. Harvey M. Deitel, "Operating Systems", Pearson Education, Third Edition, 2013.
4. Silberschatz, Galvin, "Operating System Concepts", Wiley, Student Edition, 2006.
5. William Stallings, "Operating System: Internals and design Principles", New Edition (7), Pearson Education India.

Web References

1. https://nptel.ac.in/courses/106108101/
2. http://www.tcyonline.com/tests/operating-system-concepts
3. http://www.galvin.info/history-of-operating-system-concepts-textbook
4. https://www.cse.iitb.ac.in/~mythili/teaching/cs347_autumn2016/index.html
5. https://www.cse.iitk.ac.in/pages/CS330.html

(In Operating Systems Lab, eliminate the Multithreading concepts and also reduce the shell programming and increase Operating System concepts)

		L	T	P	C	Hrs
A20CAL305	**OPERATING SYSTEMS LAB**	**0**	**0**	**4**	**2**	**30**

Course Objectives

- To learn basic UNIX / LINUX commands
- To develop programs in Linux environment using system calls.
- To implement the CPU scheduling algorithms.
- To implement Deadlock handling algorithm.
- To develop solutions for synchronization problems using semaphores

Course Outcomes

After completion of the course, the students will be able to

CO1 – Understand the basic commands for UNIX / Linux.
CO2 – Develop simple shell programs**.**
CO3 – Implement different Scheduling Algorithms.
CO4 – Apply the basic concepts of Deadlock Handling procedures.
CO5 – Simulate Critical Section problem using Semaphore.

List of Exercises

1. Study of basic UNIX / Linux commands
2. Shell Programming - I
   (a) To Write a Shell program to count the number of words in a file.
   (b) To Write a Shell program to calculate the factorial of a given number.
   (c) To write a Shell program to generate Fibonacci series.
   (d) Write a Shell Program to wish the user based on the login time.
3. Shell Programming - II
   (a) Loops
   (b) Patterns
   (c) Expansions
   (d) Substitutions
4. Programs using the following system calls of UNIX/Linux operating system: fork, exec, getpid, exit, wait, close, stat, open dir, read dir.
5. To write a program to simulate cat command.
6. To write a program to simulate head and tail commands.
7. Simulate UNIX commands like ls, grep.
8. Process Scheduling- FCFS, SJF, Priority and Round robin.
9. Implementation of Banker's algorithm.
10. Producer and Consumer problem using semaphores.

Reference Books

1. William Stallings, "Operating System", Pearson Education, Sixth edition, 2015.
2. Andrew S. Tanenbaum, Modern Operating Systems,3rd edition Prentice Hall of India Pvt. Ltd, 2015.
3. Harvey M. Deitel, "Operating Systems", Pearson Education Pvt, Third Edition, 2013
4. William Stallings, "Operating System: Internals and design Principles", Old Edition(7), Pearson Education,2013.
5. Silberschatz, Galvin, "Operating System Concepts", Wiley, Student Edition,2006.

Web References

1. https://www.geeksforgeeks.org

2. http://avanthioslab.blogspot.com/2016/08/file-organization-techniques.html
3. https://www.programming9.com/programs/c-programs/285-page-replacement-programs-in-c

(In Python Programming Lab, only 10 to 12 exercises are enough.)

A20CAL306	PYTHON PROGRAMMING LAB	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To acquire programming skill in core python.
- To learn how to design python program and applications.
- To acquire object oriented skills in python.
- To design and implement modules and packages.
- To develop the skill of designing applications.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Examine Python syntax and semantics.
CO2 - Demonstrate proficiency in handling Strings and File Systems.
CO3 - Compile, run and manipulate Python Programs using core data structures.
CO4 - Interpret the concepts of Object-Oriented Programming as used in Python.
CO5 - Implement exemplary applications related to modules and packages in Python.

List of Exercises

1. Demonstrate python program using Arithmetic expressions and Relational Expressions.
2. Demonstrate python program using Strings.
3. Demonstrate python program for the decision making statements.
4. Write Python Functions to facilitate code reuse.
5. Basic python applications using List, Tuples, Sets.
6. Implementation of Searching and Soring.
7. Implement python programs using Dictionaries
8. Illustrate file concepts with real time problems
9. Use Exception handling in python applications for error handling.
10. Implement simple applications using Modules and Packages.

Reference Books

1. Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford University Press; First edition,2017.
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, “Introduction to Programming in Python: An Inter-disciplinary Approach”, Pearson India Education Services Pvt.,2016.
3. Timothy A. Budd, “Exploring Python”, Mc-Graw Hill Education (India) Private Ltd.,2015.
4. Ben Stephenson, “The Python Workbook A Brief Introduction with Exercises and Solutions”, Springer International Publishing, 2014.
5. Paul Gries, Jennifer Campbell and Jason Montojo, “Practical Programming: An Introduction to Computer Science using Python 3”, Pragmatic Programmers, LLC, Second edition, 2013.

Web References

1. https://nptel.ac.in/courses/106/106/106106182/
2. https://www.learnpython.org/
3. https://pythonprogramming.net/introduction-learn-python-3-tutorials/
4. https://www.codecademy.com/learn/learn-python

(In Object Oriented Analysis and Design (DSE), the content of the syllabus must be reduced according to diagram specific.)

		L	T	P	C	Hrs
A20CAE302	**OBJECT ORIENTED ANALYSIS AND DESIGN**	**3**	**0**	**0**	**3**	**45**

Course Objectives

- To understand objects, classes and inheritance.
- To learn the utilization of software objects to build software projects.
- To use UML in requirements elicitation and designing.
- To gain knowledge in the concepts of relationships and aggregations.
- To extract Object Oriented Analysis Processes.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Analyze, design and document the requirements through use case driven approach.
CO2 - Categorize the different object oriented methodologies.
CO3 - Develop and Explore the Classes and Its Relationships.
CO4 - Apply the concepts of architectural design for view layer and access layer.
CO5 - Test for the software quality using different testing strategies.

UNIT I AN OVERVIEW OF OBJECT ORIENTED SYSTEM DEVELOPMENT (9 Hrs)

Introduction – Object Oriented System Development Methodology – Why object orientation – Overview of Unified Approach – Object Basics: Object oriented philosophy – Objects – Classes – Attributes – Object behavior and methods – Encapsulation and Information Hiding – Class hierarchy – Polymorphism – Object Relationships and Associations.

UNIT II OBJECT ORIENTED METHODOLOGIES (9 Hrs)

Rumbaugh et al.'s Object modeling technique – Booch methodology – Jacobson et al. Methodologies – Patterns – Framework – Unified approach – Unified modeling language: Static and Dynamic Model – UML Diagrams – UML class diagram – UML use case diagram - UML dynamic modeling – UML extensibility – UML meta model.

UNIT III OBJECT ORIENTED ANALYSIS (9 Hrs)

Business object analysis – Use case driven object oriented analysis – Business process modeling – Use Case model - Developing Effective Documentation – Naming Classes – Identifying Object Relationships – Attributes and Methods: Association – Super-Subclass Relationship – IS-A Relationship.

UNIT IV OBJECT ORIENTED DESIGN (9 Hrs)

Object Oriented Design Process – Object Oriented Design Axioms – Corollaries – Designing Classes: Object constraint language – Process of designing class – Class visibility – Refining attributes –View Layer: Designing View Layer Classes – Macro Level Process – Micro Level Process – Purpose of View Layer Interface – Prototyping the user interface.

UNIT V SOFTWARE QUALITY (9 Hrs)

Software Quality Assurance: Quality Assurance Test – Testing strategies – Impact of object oriented testing – Test cases – Test Plan – Myers debugging principle. System usability and measuring user satisfaction: Usability testing – User satisfaction testing.

Text Books

1. John Deacon, “Object Oriented Analysis and Design”, Addison Wesley, 1st Edition, 2012.
2. Grady Booch, James Rumbaugh, and Ivar Jacobson, “The Unified Modeling Language User Guide”, Addison Wesley, 3rd Edition , 2011.
3. Ali Bahrami, “Object oriented systems development using the unified modeling language”, McGraw- Hill, 1st Edition, 2008.

Reference Books

1. Craig Larman, “Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Developmentll”, Pearson Education, Third Edition, 2005.
2. Mike O’Docherty, “Object-Oriented Analysis & Design: Understanding System Development with UML 2.0”, John Wiley & Sons, 2005.
3. Bernd Oestereich, “Developing Software with UML, Object - Oriented Analysis and Design in Practice”, Addison-Wesley, 2nd Edition 2004.
4. Martin Fowler, “UML Distilled: A Brief Guide to the Standard Object Modeling Language”, Third edition, Addison Wesley, 2003.
5. Erich Gamma, a n d Richard Helm, Ralph Johnson, John Vlissides, “Design patterns: Elements of Reusable Object-Oriented Software”, Addison-Wesley, 1995.

Web References

1. www.omg.org
2. http://www.ibm.com/developerworks/rational/products/rose/
3. http://www.smartdraw.com/resources/tutorials/jacobson-oose-diagrams/
4. https://www.tutorialspoint.com/object_oriented_analysis_design/index.htm
5. https://www.uml-diagrams.org/
6. https://nptel.ac.in/courses/106/105/106105153/

(In Software Project Management (DSE), reduce the content of all the units.)

A20CAE303 SOFTWARE PROJECT MANAGEMENT

L	T	P	C	Hrs
3	0	0	3	45

Course Objectives

- To understand objects, classes and inheritance.
- To learn the utilization of software objects to build software projects.
- To use UML in requirements elicitation and designing.
- To gain knowledge in the concepts of relationships and aggregations.
- To extract Object Oriented Analysis Processes.

Course Outcomes

After completion of the course, the students will be able to
CO1 - Analyze, design and document the requirements through use case driven approach.
CO2 - Categorize the different object oriented methodologies.
CO3 - Develop and Explore the Classes and Its Relationships.
CO4 - Apply the concepts of architectural design for view layer and access layer.
CO5 - Test for the software quality using different testing strategies.

UNIT I: PROJECT CONCEPTS AND ITS MANAGEMENT (9 Hrs)
Project life cycle models - ISO 9001 model - Capability Maturity Model - Project, Planning Project tracking - Project closure - Evolution of Software Economics – Software Management Process Framework: Phases, Artifacts, Workflows, Checkpoints.

UNIT II: COST ESTIMATION (9 Hrs)
Problems in Software Estimation – Algorithmic Cost Estimation Process, Function, Points, SLIM (Software Life cycle Management), COCOMO II (Constructive Cost Model) – Estimating Web Application Development – Concepts of Finance, Activity Based Costing and Economic Value Added (EVA) – Balanced Score Card.

UNIT III: SOFTWARE QUALITY MANAGEMENT (9 Hrs)
Software Quality Factors – Software Quality Components – Software Quality Plan– Software Quality Metrics – Software Quality Costs – Software Quality Assurance-Standard – Certification – Assessment.

UNIT IV: SOFTWARE MANAGEMENT AND METRICS (9 Hrs)
Software Configuration Management – Risk Management: Risk Assessment: Identification / Analysis / Prioritization – Risk Control: Planning / Resolution /Monitoring – Failure Mode and Effects Analysis (FMEA) –Defect Management-Cost Management. Software Metrics –

UNIT V: PROJECT EVALUATION AND EMERGING TRENDS (9 Hrs)
Strategic Assessment–Technical Assessment–Cost Benefit Analysis–Cash Flow Forecasting– Cost Benefit Evaluation Technique–Risk Evaluation–Software Effort Estimation. Emerging Trends: Import of the internet on project Management –people Focused Process Models.

Text Book:

1. Ramesh Gopalaswamy, “Managing and Global Software Projects”, Tata McGraw Hill, 2017.

2. Neal Whitten, “Managing Software Development Projects”, John Wiley & Sons, Inc., 2 nd Ed., 1995.

Reference Books:

1. Demarco, T. and Lister, T. “Peopleware: Productive Projects and Teams, 2nd Ed.”, Dorset House, 1999.
2. Royce, W. “Software Project Management: A Unified Framework”, Addison-Wesley, 1998.
3. Demarco, T. and Lister, T. “Peopleware: Productive Projects and Teams, 2ndEd.”, Dorset House,1999.
4. Fenton, N.E., and Pfleeger, S.L. “Software Metrics: A Rigorous and Practical Approach, Revised” Brooks Cole, 1998.

Web References

1. www.omg.org
2. http://www.ibm.com/developerworks/rational/products/rose/
3. http://www.smartdraw.com/resources/tutorials/jacobson-oose-diagrams/
4. https://www.tutorialspoint.com/object_oriented_analysis_design/index.htm
5. https://www.uml-diagrams.org/
6. https://nptel.ac.in/courses/106/105/106105153/

(In Semester IV, in Database Management Systems course, eliminate Unit – V and move the Transactions Topics to Unit – V.)

		L	T	P	C	Hrs
A20CAT407	**DATABASE MANAGEMENT SYSTEMS**	**4**	**0**	**0**	**4**	**60**

Course Objectives

- To learn about Database Structure and Data Models.
- To study SQL Commands for storing and retrieving data into the database.
- To study the Relational database system design
- To understand the concept of Transactions
- To understand the concept of Concurrency Control and Recovery System

Course Outcomes

After completion of the course, the students will be able to

CO1 - Design conceptual data model using Entity Relationship Diagram.
CO2 - Design conceptual and logical database models for an application.
CO3 - Normalize relational database design of an application.
CO4 - Explain the need for Indexing, Hashing and Transactions in database**.**
CO5 - Understand the strategies for providing security, privacy, and recovery of data.

UNIT I INTRODUCTION (12Hrs)

Database System Application – Purpose of Database Systems – View of Data – Database Languages – Relational Database – Database Design – System Structure – Database Architecture. Database Design and E-R Model: Overview of the Design Process – The E-R Model – Constraints – E-R Diagrams- E-R Design Issues – Extended E-R features – Reduction to Relational Schemas – Other aspects of Database Design.

UNIT II RELATIONAL MODEL (12Hrs)

Structure of Relational Database – Fundamental Relational Algebra Operations – Extended Relational Algebra Operations – Modification of the Database. Structured Query Language: Introduction – Basic Structure of SQL Queries – Set Operations – Additional Basic Operations – Aggregate Functions – Null Values – Nested Sub queries – Views – Join Expression.

UNIT III RELATIONAL DATABASE DESIGN (12Hrs)

Features of Good Relational Designs – 1NF – 2NF – 3NF and 4NF with Examples. Atomic Domains and first Normal form – Decomposition using Functional Dependencies – Functional Dependency Theory – Algorithm for Decomposition – Decomposition using Multivalued Dependencies.

UNIT IV INDEXING - HASHING AND TRANSACTION MANAGEMENT (12Hrs)

Basic Concepts – Ordered Indices – B+ Tree Index Files – B-Tree Files – Multiples – Key Access – Static Hashing – Dynamic Hashing – Comparison of Ordered Indexing and Hashing – Bitmap Indices.

UNIT V TRANSACTION MANAGEMENT (12Hrs)

Transaction Management: Transaction concept – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation and Atomicity – Serializability – Recoverability – Transaction Isolation Levels – Implementation of Isolation Levels.

Text Books

1. Abraham Silberschatz, Henry F Korth, S Sudharshan, “Database System Concepts”, McGraw-Hill, 7th Edition, 2019.
2. RamezElmasri and ShamkantNavathe, Durvasula V L N Somayajulu, Shyam K Gupta, “Fundamentals of Database Systems”, Pearson Education, 2018.
3. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom, “Database Systems The Complete Book” Prentice Hall, 2nd Edition, 2014.

Reference Books

1. Raghu Ramakrishna, Johannes Gehrke, “Database Management Systems”, McGraw Hill, 3rdEdition,2014.
2. G.K.Gupta,"Database Management Systems”, Tata McGraw Hill, 2011.
3. Date CJ, Kannan A, Swamynathan S, “An Introduction to Database System”, Pearson Education, 8thEdition,2006.
4. Paul Beynon-Davies, “Database Systems”, Palgrave Macmillan, 3rdEdition, 2003.
5. Mukesh Chandra Negi, “Fundamentals of Database Management Systems”, BPB Publications, 2019.

Web References

1. https://docs.oracle.com/cd/E11882_01/server.112/e41084/toc.htm MySQL Online Documentation
2. http://dev.mysql.com/doc/
3. http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf
4. https://nptel.ac.in/courses/106/106/106106095/
5. https://www.tutorialspoint.com/dbms/index.htm

(In Computer Network Subject, reduce the “Routing Algorithms” concepts.)

A20CAT408	COMPUTER NETWORKS	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To understand the basic concepts of Data Communications.
- To understand the functionalities and components involved in the physical layer.
- To learn the basic concepts of data link layer services and network layer communication protocols
- To understand various load characteristics and network traffic conditions, decide the transport protocols to be used.
- To analyze and compare the different protocols available in the application layer.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Analyze the network components and network standards.
CO2 - Determine the Physical layer functionalities, Transmission modes and media**.**
CO3 - Analyze the Error correction and detection techniques and determine the proper usage of IP address, subnet mask and default gateway in a routed network.
CO4 - Describe, analyze and compare different protocols in transport layer**.**
CO5 - Analyze the functional working of different protocols of application layer**.**

UNIT I DATA COMMUNICATIONS (12Hrs)

Overview of Data Communications – Networks and its types – Network topologies. Transmission technologies: Signal Transmission – Digital signaling – Analog Signaling. Networks Models: Protocol Layering – OSI reference model – TCP/IP Protocol suite.

UNIT II PHYSICAL LAYER (12Hrs)

Physical layer functionalities – Analog to digital conversion using PCM, Transmission Modes: Parellel–Serial.Transmission Media: Guided and unguided media.Switching: Introduction. Circuit Switching and Packet switching Networks.

UNIT III DATA LINK LAYER AND NETWORK LAYER (12Hrs)

Data link layer services – Error Detection and Correction – Sliding window protocols – Network devices. Network layer functionality. Routing Algorithms: Shortest path algorithm, Distance vector routing – Subnetting – Network layer protocols: IPV4, IPV6.

UNIT IV TRANSPORT LAYER (12Hrs)

The Transport Services - Connection management – Transport layer Congestion Control – Transport Layer Protocols: User Datagram Protocol (UDP) – Transmission Control Protocol (TCP).

UNIT V APPLICATION LAYER (12Hrs)

Application Layer Protocols – HTTP – FTP – Telnet – Email (SMTP, POP3, IMAP, MIME) – DNS – Need for Cryptography and Network Security – Firewalls.

Text Books

1. Behrouz A. Forouzan, Data Communications and Networking, Fifth Edition TMH, 2013.
2. Tanenbaum,A.S. and David J. Wetherall “Computer Networks”, 5th ed., Prentice Hall, 2011
3. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach: International Edition”, Pearson Education, Sixth edition, 2013.

Reference Books

1. Larry L. Peterson and Bruce S. Davie, “Computer Networks- A system approach”, 5th edition, Elsevier, 2012.
2. Stallings, W., “Data and Computer Communications”, 10th Ed., Prentice Hall Int. Ed., 2013.
3. DayanandAmbawade, Deven Shah, "Advanced Compter Networks", Dreamtech Press, 1st edition, 2011.
4. PallapamanviV , "Data Communications and Computer Networks", PHI, 4th edition, 2014.
5. Andre S.Tanenbaum, "Computer Networks", Pearson Publication, 4th Edition, 2018.

Web References

1. https://www.geeksforgeeks.org/last-minute-notes-computer-network/
2. https://lecturenotes.in
3. https://www.cse.iitk.ac.in/users/dheeraj/cs425/
4. https://nptel.ac.in/courses/106/105/106105183/
5. https://nptel.ac.in/courses/106/105/106105081/

(Move the “Computer Graphics and Multimedia” course to DSE and bring the “Software Engineering” course as the DSC in Semester-IV.)

SEMESTER – IV										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
heory										
1	A20CAT407	Data Base Management Systems	DSC	4	0	0	4	25	75	100
2	A20CAT408	Computer Networks	DSC	4	0	0	4	25	75	100
3	A20CAT409	Software Engineering	DSC	4	0	0	4	25	75	100
4	A20CAE4XX	Discipline Specific Elective– II	DSE	3	0	0	3	25	75	100
5	A20XXO4XX	Open Elective – II	OE	2	0	0	2	25	75	100
ractical										
6	A20CAL407	DBMS Lab	DSC	0	0	4	2	50	50	100
7	A20CAL408	Computer Networks Lab	DSC	0	0	4	2	50	50	100
kill Enhancement Course										
8	A20CAS404	Statistical Package for Social Sciences (SPSS)	SEC	0	0	2	2	100	0	100
mployment Enhancement Course										
9	A20CAC404	Mobile Application Development / RDBMS	EEC	-	-	4	-	100	-	100
							23	**425**	**475**	**900**

(In Computer Networks Lab course, try to conduct first 8 exercises using JAVA and remaining programs in CISCO models.)

		L	T	P	C	Hrs
A20CAL408	**COMPUTER NETWORKS LAB**	**0**	**0**	**4**	**2**	**30**

Course Objectives

- To gain and explore the basic concepts of Data Communications.
- To understand the signals and transmission media involved in the physical layer.
- To learn the basic concepts of data link layer services and network layer communication protocols
- To synthesize various load characteristics and network traffic conditions, decide the transport protocols to be used.
- To analyze and compare the different protocols available in the application layer and Network Security.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Analyze the network components and network standards.
CO2 - Determine the Physical layer functionalities, Transmission media and Switching**.**
CO3-Analyze the Error correction and detection techniques and determine the proper usage of IP address, subnet mask and default gateway in a routed network
CO4 - Describe, analyze and compare different protocols in transport layer**.**
CO5 -Analyze the functional working of different protocols of application layer and Network Security**.**

List of Exercises

Implement the following exercises using JAVA:

1. Implementation of a socket program for Echo/Ping/Talk commands.
2. Creation of a socket between two computers and enable file transfer between them. Using (a.)TCP (b.) UDP
3. Implementation of a program for Remote Command Execution (Two M/Cs may be used).
4. Implementation of a program for CRC and Hamming code for error handling.
5. Writing a code for simulating Sliding Window Protocols.
6. Create a socket for HTTP for web page upload & Download.
7. Write a program for TCP module Implementation.(TCP services).
8. Write a program to implement RCP (Remote Capture Screen).

Implement the following exercises using CISCO Simulator:

9. Implementation (using NS2/Glomosim) and Performance evaluation of the following routing protocols:
    a. Shortest path routing
    b. Flooding
    c. Link State
    d. Hierarchical
10. Broadcast /Multicast routing.
11. Implementation of ARP.
12. Throughput comparison between 802.3 and 802.11.
13. Study of Key distribution and Certification schemes.
14. Design of an E-Mail system.
15. Implementation of Security Compromise on a Node.
16. Implementation of Various Traffic Sources.

Reference Books

1. AndrewS.Tanenbaum,"Computer Networks",Pearson Publication,4th Edition,2018.

2. Pallapamanvi. V ,"Data Communications and Computer Networks", PHI, 4th edition, 2014.
3. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach: International Edition”, Pearson Education, Sixth edition, 2013.
4. Stallings, W., “Data and Computer Communications”, 10th Ed., Prentice Hall Int. Ed., 2013.
5. DayanandAmbawade, Deven Shah,"Advanced Computer Networks", Dreamtech Press, 1st edition, 2011.

Web References

1. https://nptel.ac.in/courses/106/105/106105183/
2. https://nptel.ac.in/courses/106/105/106105081/
3. https://www.geeksforgeeks.org/last-minute-notes-computer-network/
4. https://lecturenotes.in
5. https://www.cse.iitk.ac.in/users/dheeraj/cs425/