SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &
Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 3rd meeting of Board of Studies

Venue

Department of Computational Studies
First Floor , SAS Block

Date & Time

12-08-2021 & 2.00pm to 4.00pm

School of Arts and Science

Department of Computational Studies

Minutes of Board of Studies Meeting for BCA

The Third meeting of Board of Studies for the course BCA in the Department of Computational Studies was held on 12.08.2021 at 02:00 P.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 Third 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).** Associate Professor and Head, Department of Computational Studies, School of Arts and Science, SMVEC Email : shanmugam.muthalu@gmail.com,Mobile : 9444370963	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. E-mail: 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. E-mail: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	**Mr. S. VISU , MCA., M.Phil.,** Assistant Professor, Department of Computational Studies , School of Arts and Science , SMVEC. Email: visucs@smvec.ac.in, Mobile: 9791966297	Internal member
7	**Mr. R. RAMAKRISHNAN, MCA.,M.Phil., M.Tech., (Ph.D)** Associate Professor, Dept. of MCA, SMVEC, E-mail:ramakrishnanmca@smvec.ac.in,Mobile:9843797091	Internal member
8	**Dr. K. KISHORE ANTHUVAN SAHAYARAJ , M.Tech., Ph.D.,** Associate Professor, Department of Artificial Intelligence and Data Science ,SMVEC,E-Mail : kishore@gmail.com ,Cell: 9976777827	Internal member

Agenda of the Meeting

Item No.: BOS/2021/SAS/UG/CA/3.1 Welcome Address, Introduction about the Institution, Department and BoS Members.
Item No.: BOS/2021/SAS/UG/CA/3.2 Confirmation of minutes of the Second meeting of the Board of Studies. The Head of the Department appraised the Board regarding the Minutes of the Second Meeting of BoS
Item No.: BOS/2021/SAS/UG/CA/3.3 To discuss and approve the improvisations in the Curriculum Structure of the Bachelor of Computer Application Programme for R-2020.
Item No.: BOS/2021/SAS/UG/CA/3.4 To discuss and approve the improvisations in the Syllabi of B.C.A for R-2020.
Item No.: BOS/2021/SAS/UG/CA/3.5 To consider any other item with the permission of the Chair.

Minutes of the Meeting

Item No.: BOS/2021/SAS/UG/CA/3.1

Mr. M. Shanmugam, Chairman, welcomed all the external and internal members. The meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Item No.: BOS/2021/SAS/UG/CA/3.2

Chairman, BoS, appraised the minutes of 2nd meeting of BoS and its implementation and then it is confirmed with the approval of BoS expertise.

Item No.: BOS/2021/SAS/UG/CA/3.3

- The Curriculum was discussed and recommended to Academic Council with the following improvisations.

Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III	Mobile Application Development A20CAC303	The Complete Course	• The Mobile Application Development (EEC) course was newly introduced instead of **Java Programming** • Because the relevant course Python Programming (DSC) is available in the semester III.
2	R 2020	IV	RDBMS - A20CAC404	The Complete Course	• The course RDBMS(EEC) has separated from the combination with Mobile Application Development and provided in the semester IV.
3	R 2020	V	angularJS-A20CAC505	The Complete Course	• The **angular JS(EEC)** course was newly introduced instead of **ARDUINO/IOT** • Because the continuation of Web Programming can be provided to the students.
4	R 2020	I	French I – A20FRT101 / Hindi I – A20HNT101	The Complete Course	• We have newly introduced Modern Indian Language courses **French I & Hindi I** from the AY 2021-22 for the I semester. (Page 9)
5	R 2020	II	French II – A20FRT202 / Hindi II – A20HNT202	The Complete Course	• We have newly introduced Modern Indian Language courses **French II & Hindi II** from the AY 2021-22 for the II semester. (Page 10)
6	R 2020	III	Financial and Management Accounting I – A20CMD301	The Complete Course	• As per the experts' suggestion we have introduced a course **Financial and Management Accounting I** instead of **Operation Research.** (Page 11)
7	R 2020	III	Accounting Software Lab – A20CMD302	The Complete Course	• As per the experts' suggestion, we have introduced a course **Accounting Software Lab** instead of Python Programming Lab (Page 13)
8	R 2020	IV	Financial and Management Accounting II – A20CMD403	The Complete Course	• As per the experts' suggestion, we have introduced a course **Financial and Management Accounting II** instead of Software Engineering. (Page 15) • Because the course **Software Engineering (A20CAT510)** is transferred to Fifth Semester. (Page 21)

					• The Course **Client Server Technology** is transferred as Discipline Specific Elective(Page17)
9	R 2020	III,IV,V & VI	-	The Complete Courses (Page 17)	• We have grouped all the discipline specific elective courses into four categories. That is 1) Networks 2) Data Science 3) Animation & Multimedia 4) Security. • At this juncture, the following courses were introduced newly: ✓ Introduction to data Science using Hadoop-A20CAE302 ✓ MANET – A20CAE405 ✓ Python for Data Science – A20CAE406 ✓ Image Processing – A20CAE407 ✓ Wireless Sensor Network – A20CAE509 ✓ Animations and Game Development – A20CAE511 ✓ Cyber Security and Digital Forensics – A20CAE512 ✓ Virtual Reality and Augmented Reality – A20CAE615 ✓ Security in Wireless Sensor Network – A20CPE616

The above corrections have been made in the curriculum and the details are given in Annexure- I (Page 9-24)

Item No.: BOS/2021/SAS/UG/CA/3.4

Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III	Python Programming – A20CAT305	Unit I & V	• The experts suggested to include the concept of OOPS in unit V , according to that there are some changes in the previous units. (Page 25)
2	R 2020	III	Computer Network – A20CAT306	Unit V	• As per the experts' suggestion, we have included the Session and Presentation Layers. (Page 26)
3	R 2020	III	Python and Network Programming	Exercise 3,4,5&6	• As per the experts' suggestion, we have combined the list of exercises.

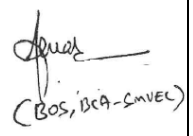
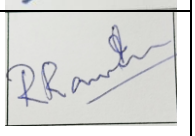
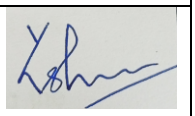
			Lab – A20CAL305		• Python programming Lab and Computer Networks Lab were two separate subjects. Now it has been combined as per the experts' suggestion (Page 28)
4	R 2020	IV	Operating System – A20CAT407	Unit V	• We have added the Components of Linux System and Architecture according to the experts' wishes (Page 29)
5	R 2020	IV	Database Management Systems – A20CAT408	Unit IV	• As per the experts' suggestions PL/SQL has been included along with function , Cursor and Trigger. (Page 31)
6	R 2020	IV	DBMS Lab – A20CAL408	Exercise 8	• The 8th exercise was changed with the concept of Cursor instead of Procedures as per experts' suggestions. (Page 33)

The above corrections have been made in the Syllabus and the details are given in Annexure- II. (Page 27-33)

Item No.: BOS/2021/SAS/UG/CA/3.5

Sl.No.	Regulation	Semester	Couse Title with Course Code	Unit No.	Particulars
1	R 2020	III,IV,V & VI	All Discipline Specific Electives Courses	The Complete Course	• The Expert members appreciated for the way of preparing the courses of Discipline Specific Electives

The above list of Discipline Specific Elective Courses listed in Annexure I. (Page 19)

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).** Associate Professor and Head, Department of Computational Studies, School of Arts and Science, SMVEC Email : shanmugam.muthalu@gmail.com,Mobile : 9444370963	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. E-mail: 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. E-mail: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	**Mr. S. VISU , MCA., M.Phil.,** Assistant Professor, Department of Computational Studies, School of Arts and Science , SMVEC. Email: visucs@smvec.ac.in,Mobile: 9791966297	Internal member	
7	**Mr. R. RAMAKRISHNAN, MCA.,M.Phil., M.Tech., (Ph.D)** Associate Professor, Department of MCA, SMVEC, E-mail:ramakrishnanmca@smvec.ac.in Mobile:9843797091	Internal member	
8	**Dr. K. KISHORE ANTHUVAN SAHAYARAJ , M.Tech., Ph.D.,** Associate Professor, Department of Artificial Intelligence and Data Science, SMVEC , Email : kishore@gmail.com , Cell: 9976777827	Internal member	

The meeting was concluded at 4:00 PM with vote of thanks by **Mr. M. Shanmugam**, Head of the Department, Department of Computational Studies.

Mr. M. Shanmugam,

HOD / Dept. of Computational Studies,
Chairman-BoS (BCA)

Dean SAS
[Dr. S. Muthulakshmi]

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 3rd meeting of Board of Studies

Annexure - I

Annexure – I

Employability Enhancement Course for Semester-I to Semester-VI are listed below:

Semester-I => Web Programming
Semester-II => Java Programming
Semester-III => Mobile Application Development
Semester-IV => RDBMS
Semester-V => angularJS
Semester-VI => Data Science

		L	T	P	C	Hrs
	FRENCH - I					
A20FRT101	(Common to B.A., B.Sc., B.Com., B.B.A. & B.C.A)	**3**	**0**	**0**	**3**	**45**

OBJECTIVES

- To enable the students read, understand, and write simplesentences.
- To grasp relevant grammar forcommunication
- To learn about the land, people and culture ofFrance.

UNITÉ - 1

Je m'appelle Elise. Et Vous ?

Vous Dansez ? D'accord

Monica, Yukiko et compagnie

UNITÉ - 2

Les Voisins de Sophie

Tu vas au Luxembourg ?

UNITÉ – 3

Nous Venons pour l'inscription

A Vélo, en tain, en avoin

Pardon, monsieru,le BHV s'il vous plait ?

UNITÉ - 4

Au marche

On déjeune ici ?

UNITÉ - 5

On va chez ma copine ?

Chez Susana

TextBook

PrescribedTextbook : *FESTIVAL 1* - Méthode de Français
Authors : Sylvie POISSON-QUINTON
Michèle MAHEO-LE COADIC
Anne VERGNE-SIRIEYS
Edition : CLE International, Nouvelle Édition révisée : 2009.

Reference Book : Festival 1

	FRENCH – II	L	T	P	C	Hrs
A20FRT202	(Common to B.A., B.Sc., B.Com., B.B.A. & B.C.A)	**3**	**0**	**0**	**3**	**45**

OBJECTIVES

- To enable the students read, understand, and write simplesentences.
- To grasp relevant grammar forcommunication
- To learn about the land, people and culture ofFrance.

UNITÉ - 1

Qu'est -ce qu'on leur offre ?
On solde !
Découvrir Paris en bus avec l'open Tour

UNITÉ - 2
Si vous gagne vous ferez quoi
Parasol ou parapluie ?

UNITÉ - 3
Quand il est midi á Paris
Vous allez Vivre
L'avenir du Français

UNITÉ - 4
Souvenirs d'enfance
j'ai fait mes études á Lyon 2

UNITÉ – 5
Retour des Antilles
Au voleur ! Au voleur

TextBooks

PrescribedTextbook : *FESTIVAL 1* - Méthode de Français
Authors : Sylvie POISSON-QUINTON
Michèle MAHEO-LE COADIC
Anne VERGNE-SIRIEYS
Edition : CLE International, Nouvelle Édition révisée : 2009.

Reference Book Festival 1

A20CAD303	FINANCIAL AND MANAGEMENT ACCOUNTING I (Common to B.C.A. & B.Sc. Mathematics)	L 4	T 0	P 0	C 4	Hrs 60

Course Objectives

- To develop a deeper understanding of the Fundamentals of Accounting
- To appreciate the role and significance of subsidiary books in accounting system
- To learn the preparation of basic financial statements of small business entities.
- To gain knowledge about the preparation of cash flow statements.
- To develop the knowledge of accounting in computerised environment.

Course Outcomes

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

CO1 – Explain the concepts of accounting and solve simple problems on fundamentals of accounting
CO2 – Prepare various subsidiary books including different types of cash books.
CO3 – Prepare the basic financial statements of various business entities
CO4 – Handle the preparation and understanding of cash flow statements
CO5 – Explain the role of computers in Accounting and Automation.

UNIT I THEORETICAL FRAMEWORK OF ACCOUNTING (10 Hrs)

Meaning and Scope of Accounting – Nature and Objectives of Accounting – Distinction between Book-Keeping and Accountancy – Accounting Transactions – Principle of Double Entry – Branches of Accounting: Financial, Cost and Management Accounting – Accounting Equation – Significant Accounting Concepts and Conventions: Business Entity, Money Measurement, Going Concern, Materiality, and Conservatism.

UNIT II ACCOUNTING PROCESS (16 Hrs)

Business Transactions – Recording of Business Transactions in Accounting – Book of Prime Record: Journal, Steps in Journalising – Book of Main Record: Ledger – Posting to Ledger. Extracting Trial Balance from Ledger Accounts. Simple Problems in Journal, Ledger and Trial Balance.

Subsidiary Books – Meaning and Importance – Types of Subsidiary Books – Types of Cash Book –Simple Problems in Sales Book, Purchases Book, and Simple Cash Book.

UNIT III BASIC FINANCIAL STATEMENTS (16 Hrs)

Profit and Loss Account or Income Statement – Meaning, Contents, and Preparation – Balance Sheet or Position Statement – Meaning, Contents and Preparation – Adjustments in Final Accounts (Closing Stock, Expenses and Income Outstanding, Expenses paid and Income received in advance, Depreciation, Provision for Bad and Doubtful Debts, Provision for Discount on Creditors, Interest on Capital and Interest on Drawings). Practical Problems on Financial Statements with basic adjustments.

Vertical Form of Financial Statements – Income Statement and Balance Sheet.

UNIT IV CASH FLOW STATEMENT (12 Hrs)

Concept of Funds and Cash in Accounting – Importance of Cash Flow in Business – Meaning and Need of Cash Flow Statement – Use of Accounting Standard 3 in the preparation of Cash Flow Statement – Classification of Cash Flow based on activities: Operating, Investing and Financing. Preparation of Cash Flow Statements. Simple Problems.

UNIT V ACCOUNTING IN COMPUTERISED ENVIRONMENT (6 Hrs)

Role of Computer in Accounting and Automation – Accounting as an Information System – Accounting Process under Manual and Computerised Accounting – Software for Accounting.

Framework of Accounting Software – Grouping of Accounts – Data Entry in Accounting Software – Generation of Reports – Use of Spreadsheets in Accounting Analysis.

Text Books

1. K.L. Nagarajan, N. Vinayagam & P.L. Mani, “Principles of Accountancy”, S. Chand & Sons, 4th Edition, 2016.
2. T.S. Reddy & Y. Hari Prasad Reddy, “Financial and Management Accounting”, Margham Publications, 4th Edition, 2018.
3. S.N. Maheswari, Suneel K. Maheswari & Sharad K. Maheswari, “An Introduction to Accountancy”, Vikas Publishing House, 12th Edition, 2019.

Reference Books

1. N. Ramachandran & Ram Kumar Kakani, “Financial Accounting for Management”, McGraw Hill, 5th Edition, 2020.
2. Hanif & Mukherjee, “Financial Accounting”, Tata McGraw Hill, 2nd Edition, 2019.
3. S.P. Jain & K.L. Narang, “Financial Accounting”, Kalyani Publishers, 12th Edition, 2014.
4. P.C. Tulsian & Bharat Tulsian, “Financial Accounting”, S.Chand, 2nd Edition, 2016.
5. R.L. Gupta & M. Radhasamy, “Advanced Accountancy – Vol.1”, Sultan Chand & Sons, 13th Edition, 2020.

Web References

1. https://www.civilserviceindia.com/subject/Management/notes/financialaccounting.html
2. https://www.taxmann.com/blogpost/2000001622/accounting-principles-andconcepts.aspx
3. https://courses.lumenlearning.com/sac-finaccounting/chapter/ledgers-journals-andaccounts/
4. http://www.accountingnotes.net/management-accounting/management-accountingmeaning-limitations-and-scope/5859
5. https://efinancemanagement.com/financial-accounting/financial-statement-notes

A20CAD304	ACCOUNTING SOFTWARE LAB (Common to B.C.A. & B.Sc. Mathematics)	L	T	P	C	Hrs
		0	0	4	2	60

Course Objectives

- To develop a deeper knowledge in fundamentals of accounting software.
- To understand the working of business transactions.
- To learn the importance of MIS.
- To gain knowledge about GST and TDS.

Course Outcomes

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

CO1 – Work with chart of accounts in accounting software.
CO2 – Prepare various business transactions in software.
CO3 – Generate various reports including customized reports
CO4 – Handle the preparation and understanding of GST and TDS

UNIT I CHART OF ACCOUNTS (15 Hrs)

An Overview of Accounting Fundamentals – Double Entry Book keeping – Types of Accounts – Golden Rules of Accounts – Source Documents for Accounting – Accounting Equation – Recording Business Transactions – Journal – Ledger – Trial Balance – Subsidiary Books – Financial Statements: Profit and Loss Account – Balance Sheet.
Getting Started with Accounting Software – Company Creation and Management – Company Features and Configuration – Chart of Accounts – Ledger – Grouping – Creation, Display and Deletion.
Inventory Masters – Creating Inventory Masters: Stock Group, Units of Measure, Stock Items, Godown/Warehouse – Stock Category Reports.

UNIT II RECORDING DAY-TO-DAY TRANSACTIONS (20 Hrs)

Business Transactions – Source Document for Voucher – Recording Transactions in Accounting Software – Accounting Vouchers: Receipt Voucher, Contra Voucher, Payment Voucher, Purchase Voucher, Sales Voucher, Debit Note Voucher, Credit Note Voucher, Journal Voucher.
Accounts Payables and Receivables – Maintaining Bill-wise details – Stock Category Report – Changing Financial Year.

UNIT III MIS REPORTS (5 Hrs)

Management Information System (MIS) – MIS Reports in Accounting Software – Trial Balance – Balance Sheet – Profit and Loss Account – Cash Flow Statement – Accounting Ratios. Books and Reports: Day Book – Receipts and Payments – Purchase Register – Sales Register – Bills Receivable and Bills Payable.

UNIT IV HANDLING GST AND TDS (20 Hrs)

Goods and Services Tax (GST) – Recording GST in Accounting Software – Generating GST Reports.
Tax Deducted at Source (TDS) – TDS in Accounting Software – TDS Activation – Statutory Masters – Configuring TDS – Booking of Expenses in Purchase Voucher – TDS Reports.

Text Books

1. Tally Education, Tally Essential Level 1, Sahaj Enterprises, 1st Edition, 2021.
2. Tally Education, Tally Essential Level 2, Sahaj Enterprises, 1st Edition, 2021.
3. Tally Education, Tally Essential Level 3, Sahaj Enterprises, 1st Edition, 2021.

Reference Books

1. DT Editorial Services, “Tally ERP 9 with GST”, DreamTech Press, 1st Edition, 2020.
2. Tally Education, “Tally ERP 9 with GST”, BPB Publishers, 1st Edition, 2018.
3. Vikas Gupta, “Comdex Tally ERP 9 with GST and MS Excel”, DreamTech Press, 1st Edition, 2018.
4. Shraddha Singh, “Tally ERP 9”, V & S Publishers, 1st Edition, 2014.
5. Soumya Ranjan Behera, “Learn Tally ERP 9 with GST”, B.K. Publications, 2th Edition, 2014.

Web References

1. https://www.youtube.com/watch?v=rG_eHA3vN1I
2. https://www.youtube.com/watch?v=Sw2H56aMe-g
3. https://www.youtube.com/watch?v=eA8oK3wn1p4
4. https://www.youtube.com/watch?v=Vi7TzAPjXu0
5. https://www.youtube.com/watch?v=Ipz1VVQGXEc

A20CAD404	FINANCIAL AND MANAGEMENT ACCOUNTING II (Common to B.C.A. & B.Sc. Mathematics)	L 4	T 0	P 0	C 4	Hrs 60

Course Objectives

- To develop a deeper understanding on financial statement analysis.
- To make them understand the accounting ratios.
- To learn the preparation of cost sheet.
- To be familiar with marginal costing and break-even analysis.
- To develop the knowledge of budgeting

Course Outcomes

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

CO1 – Work with the tools of financial analysis
CO2 – Compute Accounting Ratios from financial statements
CO3 – Prepare the cost sheet with unit cost details
CO4 – Work with marginal costing and break-even analysis
CO5 – Prepare the Sales, Production, Cash and Flexible Budgets.

UNIT I FINANCIAL STATEMENTS ANALYSIS (10 Hrs)

Financial Statements – Significance – Users of Financial Statements – Analysis of Financial Statements – Tools of Financial Analysis: Horizontal Analysis, Vertical Analysis, Trend Analysis, and Ratio Analysis. Preparation of Comparative Financial Statements and Common-size Financial Statements. Simple Problems.

UNIT II ACCOUNTING RATIOS (12 Hrs)

Accounting Ratios – Classification of Ratios – Basis of Origin and Functional Classification. Ratios to test Solvency, Profitability, Liquidity, Efficiency and Performance of the business – Computation of Accounting Ratios and Interpretation. Problems on Computation of Ratios from given Financial Statements and other information.

UNIT III COST CONCEPTS AND COST SHEET (12 Hrs)

Cost – Concept and Meaning – Classification of Costs – Elements of Cost – Statement of Cost – Unit Costing – Problems on Cost Sheet.

UNIT IV MARGINAL COSTING AND BREAK-EVEN ANALYSIS (14 Hrs)

Marginal Cost and Marginal Costing – Concept of Contribution – Profit-Volume Ratio – Margin of Safety – Break-Even Analysis: Preparation of Break-Even Chart – Problems on Break-Even Analysis.
Uses of Marginal Costing in decision-making – Pricing Decisions – Make or Buy Decisions – Accepting a Foreign Offer – Sales Mix Decisions.

UNIT V BUDGETING (12 Hrs)

Budget and Budgeting – Types of Budgets – Functional Budgets: Sales Budget, Production Budget, Materials Purchase Budget, Cash Budget. Concept of Flexible Budgeting – Concept of Zero Base Budgeting. Problems on preparation of Sales, Production, Cash and Flexible Budgets.

Text Books

1. P. Periyasamy, “Financial, Cost and Management Accounting”, Himalaya Publishing House, 1st Edition, 2011.
2. T.S. Reddy & Y. Hari Prasad Reddy, “Financial and Management Accounting”, Margham Publications, 4th Edition, 2018.
3. R.S.N. Pillai & B.N. Bagavathi, “Management Accounting”, S. Chand & Sons, 5th Edition, 2010.

Reference Books

1. N. Ramachandran & Ram Kumar Kakani, “Financial Accounting for Management”, McGraw Hill, 5th Edition, 2020.
2. M.N. Arora, “Cost and Management Accounting”, Vikas Publishing House, 10th Edition, 2019.
3. I.C. Jain, “Management Accounting”, Vikas Publishers House, 6th Edition, 2018.
4. N.P. Srinivasan & M. Sakthivel Murugan, “Accounting for Management”, S. Chand & Sons, 6th Edition, 2018.
5. M.Y Khan & P K Jain, “Management Accounting”, McGraw Hill, 9th Edition, 2018.

Web References

1. https://www.civilserviceindia.com/subject/Management/notes/financialaccounting.html
2. https://www.taxmann.com/blogpost/2000001622/accounting-principles-andconcepts.aspx
3. https://www.dynamictutorialsandservices.org/2018/10/management-accounting-notes.html
4. https://books.google.co.in/books?id=LZpdDwAAQBAJ&printsec=frontcoverv=onepage&q&f=false
5. http://www.accountingnotes.net/management-accounting/management-accountingmeaning-limitations-and-scope/5859

DISCIPLINE SPECIFIC ELECTIVE COURSES

ELECTIVES										
Sl. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Discipline Specific Elective (DSE - I) – offered in Third Semester										
1	A20CAE301	Data Mining and Warehousing	DSE	3	-	-	3	25	75	100
2	A20CAE302	Introduction to Data Science using Hadoop	DSE	3	-	-	3	25	75	100
3	A20CAE303	Computer Graphics and Multimedia	DSE	3	-	-	3	25	75	100
4	A20CAE304	Information Security	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - II) – offered in Fourth Semester										
1	A20CAE405	MANET	DSE	3	-	-	3	25	75	100
2	A20CAE406	Python for Data Science	DSE	3	-	-	3	25	75	100
3	A20CAE407	Image Processing	DSE	3	-	-	3	25	75	100
4	A20CAE408	Ethical Hacking	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - III) – offered in Fifth Semester										
1	A20CAE509	Wireless Sensor Network	DSE	3	-	-	3	25	75	100
2	A20CAE510	Data Science using R	DSE	3	-	-	3	25	75	100
3	A20CAE511	Animations and Game Development	DSE	3	-	-	3	25	75	100
4	A20CAE512	Cyber Security and Digital Forensics	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - IV) – offered in Sixth Semester										
1	A20CAE613	Client Server Technology	DSE	3	-	-	3	25	75	100
2	A20CAE614	Data Visualization using MATLAB	DSE	3	-	-	3	25	75	100
3	A20CAE615	Virtual Reality and Augmented Reality	DSE	3	-	-	3	25	75	100
4	A20CAE616	Security in Wireless Sensor Networks	DSE	3	-	-	3	25	75	100

STRUCTURE FOR UNDERGRADUATE PROGRAMME

Sl. No	Course Category	Breakdown of Credits
1	Language	6
2	English	6
3	Discipline Specific Core Courses (DSC)	84
4	Discipline Specific Elective Courses (DSE)	12
5	Inter-Disciplinary courses (IDC)	12
6	Skill Enhancement Courses (SEC)	12
7	Employability Enhancement Courses (EEC*)	-
8	Ability Enhancement Compulsory Courses (AECC)	4
9	Open Elective (OE)	4
10	Extension Activity (EA)	1
	Total	**141**

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

Sl.No	Course Category	Credits per Semester						Total Credits
		I	II	III	IV	V	VI	
1	Language Modern Indian Language (MIL)	3	3	-	-	-	-	6
2	English (ENG)	3	3	-	-	-	-	6
3	Discipline Specific Core Courses (DSC)	12	12	12	16	18	14	84
4	Discipline Specific Elective Courses (DSE)	-	-	3	3	3	3	12
5	Inter-Disciplinary courses (IDC)	4	4	4	-	-	-	12
6	Skill Enhancement Courses (SEC)	2	2	2	2	2	2	12
7	Employability Enhancement Courses (EEC*)	-	-	-	-	-	-	-
8	Ability Enhancement Compulsory Courses (AECC)	2	2	-	-	-	-	4
9	Open Elective (OE)	-	-	2	2	-	-	4
10	Extension Activity (EA)	-	1	-	-	-	-	1
	Total	26	27	23	23	23	19	**141**

**** EEC will not be included for the computation of "Total of credits" as well as "CGPA" calculation***

BCA - Curriculum

SEMESTER – I										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Theory										
1	A20TAT101 / A20HNT101 / A20FRT101	Tamil - I / Hindi – I / French – I	MIL	3	0	0	3	25	75	100
2	A20GET101	General English – I	ENG	3	0	0	3	25	75	100
3	A20CAT101	Problem Solving using C	DSC	4	0	0	4	25	75	100
4	A20CAT102	Digital Logic and Computer Organization	DSC	4	0	0	4	25	75	100
5	A20CAD101	Computational Mathematics	IDC	3	1	0	4	25	75	100
Ability Enhancement and Compulsory Course										
6	A20AET101	Environmental Studies	AECC	2	0	0	2	100	0	100
Practical										
7	A20CAL101	Programming in C Lab	DSC	0	0	4	2	50	50	100
8	A20CAL102	Digital Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20CAS101	Communication Skills Lab	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
10	A20CAC101	Web Programming	EEC	0	0	4	0	100	0	100
							26	**525**	**475**	**1000**

SEMESTER – II										
S. No.	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Theory										
1	A20TAT202 / A20HNT202/ A20FRT202	Tamil - II / Hindi – II / French – II	MIL	3	0	0	3	25	75	100
2	A20GET202	General English-II	ENG	3	0	0	3	25	75	100
3	A20CAT203	Java Programming	DSC	4	0	0	4	25	75	100
4	A20CAT204	Data Structures and Algorithms	DSC	4	0	0	4	25	75	100
5	A20CAD202	Numerical Methods and Statistics	IDC	3	1	0	4	25	75	100
Ability Enhancement and Compulsory Course										
6	A20AET202	Public Administration	AECC	2	0	0	2	100	0	100
Practical										
7	A20CAL203	Java Programming Lab	DSC	0	0	4	2	50	50	100
8	A20CAL204	Data Structures Lab	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20CAS202	Quantitative Aptitude and Logical Reasoning	SEC	0	0	4	2	100	0	100
Extension Activities										
10	A20EAL201	National Service Scheme	EA	0	0	2	1	50	0	50
Employment Enhancement Course										
11	A20CAC202	Java Programming	EEC	0	0	4	0	100	0	100
							27	**575**	**475**	**1050**

SEMESTER – III										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT305	Python Programming	DSC	4	0	0	4	25	75	100
2	A20CAT306	Computer Networks	DSC	4	0	0	4	25	75	100
3	A20CAE3XX	Discipline Specific Elective – I	DSE	3	0	0	3	25	75	100
4	A20CAD303	Financial and Management Accounting - I	IDC	3	1	0	4	25	75	100
5	A20XXO3XX	Open Elective – I	OE	2	0	0	2	25	75	100
Practical Python Programming Lab										
6	A20CAL305	Python and Network Programming Lab	DSC	0	0	4	2	50	50	100
7	A20CAD304	Accounting Software Lab	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CAS303	Android App Development	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20CAC303	Mobile Application Development	EEC	0	0	4	0	100	0	100
							23	**425**	**475**	**900**

SEMESTER – IV										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT407	Operating Systems	DSC	4	0	0	4	25	75	100
2	A20CAT408	Data Base Management Systems	DSC	4	0	0	4	25	75	100
3	A20CAE4XX	Discipline Specific Elective– II	DSE	4	0	0	4	25	75	100
4	A20CAD404	Financial and Management Accounting – II	IDC	3	0	0	4	25	75	100
5	A20XXO4XX	Open Elective – II	OE	2	0	0	2	25	75	100
Practical										
6	A20CAL407	Operating Systems Lab	DSC	0	0	4	2	50	50	100
7	A20CAL408	DBMS Lab	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CAS404	Office Automation Tools	SEC	0	0	2	2	100	0	100
Employment Enhancement Course										
9	A20CAC404	RDBMS	EEC	-	-	4	-	100	-	100
							24	**425**	**475**	**900**

SEMESTER – V										
S. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT509	Web Technology	DSC	4	0	0	4	25	75	100
2	A20CAT510	Software Engineering	DSC	4	0	0	4	25	75	100
3	A20CAT511	Cloud Computing	DSC	3	0	0	3	25	75	100
4	A20CAT512	Artificial Intelligence	DSC	3	0	0	3	25	75	100
5	A20CAE5XX	Discipline Specific Elective–III	DSE	3	0	0	3	25	75	100
Practical										
6	A20CAL509	Web Technology Lab	DSC	0	0	4	2	50	50	100
7	A20CAP501	Mini Project(Java/Python/Web)	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20CAS505	Entrepreneurial Skills	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20CAC505	angularJS	EEC	0	0	4	0	100	0	100
							23	**425**	**475**	**900**

SEMESTER – VI										
S.No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20CAT613	Block chain Technology	DSC	**3**	0	0	3	25	75	100
2	A20CAT614	Internet of Things	DSC	**3**	0	0	3	25	75	100
3	A20CAT615	.Net Framework	DSC	**3**	0	0	3	25	75	100
4	A20CAE6XX	Discipline Specific Elective –IV	DSE	**3**	0	0	3	25	75	100
Practical										
5	A20CAP602	Project Work& Viva-voce	DSC	**0**	0	10	5	40	60	100
Skill Enhancement Course										
6	A20CAS606	Research Methodology	SEC	**0**	0	4	2	100	0	100
Employment Enhancement Course										
7	A20CAC606	Data science	EEC	0	0	4	0	100	0	100
							19	**340**	**360**	**700**

DISCIPLINE SPECIFIC ELECTIVE COURSES

ELECTIVES										
Sl. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**Max. Marks**		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
Discipline Specific Elective (DSE - I) – offered in Third Semester										
1	A20CAE301	Data Mining and Warehousing	DSE	3	-	-	3	25	75	100
2	A20CAE302	Introduction to Data Science using Hadoop	DSE	3	-	-	3	25	75	100
3	A20CAE303	Computer Graphics and Multimedia	DSE	3	-	-	3	25	75	100
4	A20CAE304	Information Security	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - II) – offered in Fourth Semester										
1	A20CAE405	MANET	DSE	3	-	-	3	25	75	100
2	A20CAE406	Python for Data Science	DSE	3	-	-	3	25	75	100
3	A20CAE407	Image Processing	DSE	3	-	-	3	25	75	100
4	A20CAE408	Ethical Hacking	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - III) – offered in Fifth Semester										
1	A20CAE509	Wireless Sensor Network	DSE	3	-	-	3	25	75	100
2	A20CAE510	Data Science using R	DSE	3	-	-	3	25	75	100
3	A20CAE511	Animations and Game Development	DSE	3	-	-	3	25	75	100
4	A20CAE512	Cyber Security and Digital Forensics	DSE	3	-	-	3	25	75	100
Discipline Specific Elective (DSE - IV) – offered in Sixth Semester										
1	A20CAE613	Client Server Technology	DSE	3	-	-	3	25	75	100
2	A20CAE614	Data Visualization using MATLAB	DSE	3	-	-	3	25	75	100
3	A20CAE615	Virtual Reality and Augmented Reality	DSE	3	-	-	3	25	75	100
4	A20CAE616	Security in Wireless Sensor Networks	DSE	3	-	-	3	25	75	100

OPEN ELECTIVE COURSES

COMPLETE LIST OF OPEN ELECTIVES OFFERED BY ALL THE DEPARTMENTS

Open Elective – I (Offered in Semester III)				
S. No	**Course Code**	**Course Title**	**Offering Department**	**Permitted Departments**
1	A20CPO310	Data Structures	Computational Studies	Chemistry, Commerce and Management,English, Mathematics, Media Studies, Physics, Bio Technology , Nutrition and Dietetics
2	A20CPO311	Programming in C	Computational Studies	Commerce and Management, Mathematics, Media Studies, Bio Technology , Nutrition and Dietetics
3	A20CPO312	Programming in Python	Computational Studies	Commerce and Management, Mathematics, Media Studies, Bio Technology , Nutrition and Dietetics

Open Elective – II (Offered in Semester IV)				
S. No	**Course Code**	**Course Title**	**Offering Department**	**Permitted Departments**
1	A20CPO410	Database Management Systems	Computational Studies	Commerce and Management, MediaStudies, Mathematics, Bio Technology , Nutrition and Dietetics
2	A20CPO411	Introduction to Data Science using Python	Computational Studies	Chemistry, Commerce and Management,English, Media Studies, Mathematics, Physics, Bio Technology , Nutrition and Dietetics
3	A20CPO412	Web Development	Computational Studies	Commerce and Management, MediaStudies, Mathematics, Bio Technology , Nutrition and Dietetics

SCHOOL OF ARTS AND SCIENCE

Department of Computational Studies

Bachelor of Computer Application

Minutes of 3rd meeting of Board of Studies

Annexure - II

Annexure – II

		L	T	P	C	Hrs
A20CAT305	**PYTHON PROGRAMMING**	**4**	**0**	**0**	**4**	**60**

Course Objectives
- To acquire programming skill in core python.
- To learn the basic looping and functions.
- To learn how to design python program and applications.
- To acquire the basic packages.
- To develop the object oriented programming.

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

CO1 – Define the structure and components of a python program.
CO2 – Illustrate the concepts of Python decision statements.
CO3 – Use list, tuple, Set and dictionary in python program.
CO4 – Read / write data from/to files and structure a program using Exceptions and Modules.
CO5 – Knowing the basic oops concepts.

UNIT I INTRODUCTION TO PYTHON PROGRAMMING LANGUAGE (10 Hrs)
Introduction to Python Language –- Strengths and Weaknesses – IDLE – Operators – Data Types – Introduction List , Tuple, Set, Dictionary. String : Slicing,Basic operations on strings- Built in methods -

UNIT II DECISION MAKING ,LOOPING & FUNCTIONS (16 Hrs)
Control Flow: Introduction – Control Flow and Syntax – Indenting – Relational Expressions – Logical Expressions – If Statement – If else – elif – Nested if. Loop: The while Loop– Nested while Loop – For Loop – Nested for Loop- –Break and continue Functions: parameters – Return values – Local and global scope – Function composition – Recursion and lambda functions.

UNIT III LIST, TUPLE, SET, DICTIONARY AND ARRAYS (12 Hrs)
Lists: List operations – List slices – List methods – List loop – Mutability – Aliasing – Cloning lists – List parameters – Tuples: Tuple assignment – Tuple as return value – Advanced list processing – List comprehension – Sets – Dictionaries: Operations and methods – Arrays.

UNIT IV FILES, EXCEPTIONS, MODULES AND PACKAGES (12 Hrs)
Built In Functions. Files and Exception: Text Files – Reading and writing files – Format operator – Command line arguments – Errors and exceptions – Handling exceptions – Modules – Standard modules – Packages.

UNIT IV OBJECT ORIENTED PROGRAMMING IN PYTHON (10 Hrs)
Classes and Objects – Constructors – Inheritance – Abstraction

Text Books

1. Martin C Brown, “Python The Complete Reference”, McGraw-Hill Education, 4th Edition,2018
2. Allen B. Downey, “Think Python: How to Think Like a Computer Scientist‘‘, Shroff/O‘Reilly Publishers, 2nd edition, 2016(http://greenteapress.com/wp/thinkpython/).
3. ReemaThareja, “Python Programming Using Problem Solving Approach”, ISBN:9780199480173, Oxford University Press, First edition, 2017.

Reference Books

1. Robert Sedgewick, “Kevin Wayne, Robert Dondero – Introduction to Programming in Python: An Inter-disciplinary Approach”, Pearson India Education Services Pvt. 2016.
2. Timothy A. Budd, “Exploring Python”, Mc-Graw Hill Education (India) Private Ltd.,2015.
3. Ben Stephenson, “The Python Workbook A Brief Introduction with Exercises and Solutions”, Springer International Publishing, Switzerland2014.

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

A20CAT306	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: Parallel– 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 – Sub netting – Network layer protocols: IPV4, IPV6.

UNIT IV TRANSPORT & SESSION LAYER (12Hrs)

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

UNIT V PRESENTATION & APPLICATION LAYER (12Hrs)

Data representation and Comparison of presentation layer - 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/

A20CAL305	PYTHON AND NETWORK PROGRAMMING LAB	L	T	P	C	Hrs
	(Common to B.Sc CS and BCA)	0	0	4	2	30

Course Objectives

- To practice the fundamental programming methodologies in the Python programming language.
- Toapplylogicalskillsforproblemsolvingusingcontrolstructuresandarrays.
- Toimplement,testanddebugprogramsthatusedifferentdatatypes,variables,strings,arrays,pointersandstructures.
- To design basic networking styles and provides recursive solution to problems.
- To understand the miscellaneous aspects of networking.

Course Outcomes

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

CO1 – Apply and practice logical formulations to solve simple problems leading to specific applications.

CO2 – Develop python programs for simple applications making use of basic constructs, arrays and strings.

CO3 – Develop the networking programs using IP.

CO4 – Design the module for Client and Server.

CO5 – Construct the network specializations.

List of Exercises

1. Finding Area of a Triangle, Rectangle and Square.
2. Checking whether a given number is Prime or not.
3. Implementation of User defined functions.
4. Various operations on List and Tuples.
5. Various operations on string and dictionary.
6. Various types of inheritance using python..
7. Detect Network Changes Automatically.
8. Log Management with Python and Network Monitoring with Cacti.
9. NetFlow and sFlow Based Monitoring.
10. Alerting and Email Notification.
11. Testing DHCP Server and Client.
12. Test Network Speed with Python.

Reference Books

1. Stallings, W., “Data and Computer Communications”, 10th Ed., Prentice Hall Int. Ed., 2013.
2. John V Guttag, “Introduction to Computation and Programming Using Python’’, MIT Press, Revised and expanded Edition, 2013.

Web References

1. https://pythonprogramming.net/introduction-learn-python-3-tutorials/
2. ttps://www2.mvcc.edu/users/faculty/jfiore/CP/labs/LaboratoryManualForComputerProgramming.pdf
3. https://www.codecademy.com/learn/learn-python
4. https://www.geeksforgeeks.org/last-minute-notes-computer-network/
5. https://lecturenotes.in

A20CAT407	OPERATING SYSTEMS	L	T	P	C	Hrs
	(Common to BCA and B.Sc CS)	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, process management.
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 – Components of Linux System – Architecture - 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

A20CAT408	DATABASE MANAGEMENT SYSTEMS (Common to BCA and B.Sc CS)	L	T	P	C	Hrs
		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 in database**.**

CO5 – Understand the strategies for Transactions and Management.

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 & PL/SQL (12Hrs)

Basic Concepts – Ordered Indices – B+ Tree Index Files – B-Tree Files – Multiples – Key Access – Static Hashing – Dynamic Hashing - PL/SQL - Basic programs – Functions Cursor- Trigger

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

A20CAL408	DBMS LAB	L	T	P	C	Hrs
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Course Objectives

- To learn and understand DDL & DML
- To learn and understand DCL.
- To implement Basic SQL commands.
- To execute PL/SQL programs.
- To develop GUI applications in any platform.

Course Outcomes

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

CO1 – Implement DDL and DML commands.
CO2 – Implement DCL commands.
CO3 – Analyze PL/SQL programs.
CO4 – Understand PL/SQL programs.
CO5 – Develop GUI applications in their known platform.

List of Exercises

1. Create Table using Data Definition Language (DDL).
2. Modify Table using Data Manipulation Language (DML).
3. Store and Retrieve data through Data Control Language (DCL).
4. Implement Constraints and Built-in functions in various tables.
5. Perform Joins and Group-by functions.
6. Implement Simple Programs in PL/SQL.
7. Create PL/SQL programs using functions.
8. Create PL/SQL programs using Cursor.
9. Create PL/SQL programs using triggers.
10. Developing GUI applications.

    - Student Information System.
    - Inventory Management.
    - Payroll Processing.

Reference Books

1. Ramez Elmasri, Durvasul VLN Somyazulu, Shamkant B Navathe, Shyam K Gupta, Fundamentals of Database Systems, Pearson Education, 7th Edition, 2016.
2. Raghu Ramakrishna, Johannes Gehrke, Database Management Systems, McGraw Hill,3rd Edition, 2014.
3. Abraham Silberschatz, Henry F Korth, S Sudharshan, Database System Concepts", McGraw-Hill Indian Edition, 7th Edition, 2013.
4. Kuhn,"RMAN Recipes for Oracle Database", Apress, 2nd Edition,2013.
5. Date CJ, Kannan A, Swamynathan S, An Introduction to Database System, Pearson Education, 8th Edition, 2006.

Web References

1. https://docs.oracle.com/cd/E11882_01/server.112/e41084/toc.htm MySQL Online Documentation
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3. http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf