

**Outcome Based Curriculum
For
B.Com Accounts and Data Science (Double Main)**

Undergraduate Programme

2020

**Faculty of Commerce
University of Kerala
Thiruvananthapuram**

Scheme and Syllabus for the First Degree Programme in Commerce –Accounts and Data Science(Double Main)under Semester System (To be introduced from 2020 admissions)

The outcome based curriculum aims to equip students with knowledge, skills, values, attitudes, leadership readiness/qualities and lifelong learning. The students on completion of this programme will attain various 21st century skills like critical thinking, problem solving, analytic reasoning, cognitive skills, self-directed learning etc. The curriculum focuses on pragmatist approach whereby practical application of theoretical concepts is taught with substantial coverage of practical and field works

The First Degree Programme in Commerce with Accounts and Data science (Double main) is intended to provide a broad framework and hence designed to address the needs of the students with accounts and data science as the core subjects of study, which is suitable for equipping them to cope with the emerging trends and challenges in the industrial and business world VIZ. preparation and interpretation of financial statements of SP,PS,JSC, etc. and awareness about data source , skill in data compilation, retrieval and related process.

1.1 Eligibility for admission

Eligibility for admissions and reservation of seats for the First Degree Programme in Commerce shall be according to the rules framed by the University from time to time. No student shall be eligible for admission to the First degree programme in Commerce unless he/she has successfully completed the examination conducted by a Board/ University at the +2 level of schooling or its equivalent. During admission marks scored in Accountancy in the Commerce group or Computer science in the science group (only one) is to be added to the total marks secured by the student in plus two to arrive the total index mark

1.2 Registration

Each student shall register for the courses in the prescribed registration form in consultation with the Faculty Advisor within two weeks from the commencement of each semester.

1.3 Duration

The normal duration of the First Degree Programme in Commerce shall be three years consisting of six semesters. The duration of each semester shall be five months inclusive of the days of examinations. Odd Semester (June-October) commences in June and Even Semester (November – March) commences in November every Year.

1.4 Programme Specific Outcomes for B.Com Accounts and Data Science

The Bachelor of Commerce with Accounts and Data Science (double Main) program enables students to attain, by the time of graduation:

- A. Demonstrate the aptitude of Accounts and Computer Application Skills and Computer based problem solving skills.
- B. Display the knowledge of appropriate theory, practices and tools for the specification, design, and implementation
- C. Ability to learn and acquire knowledge through online courses available at different MOOC Providers.
- D. Ability to link knowledge of Accounts with Data Science and other auxiliary disciplines of study.
- E. Display ethical code of conduct in usage of Internet and Cyber systems.
- F. Ability to pursue higher studies of specialization and to take up technical employment.
- G. Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
- H. Ability to operate, manages, deploy, configure computer network, hardware, software operation of an organization.
- I. Ability to present result using different presentation tools.
- J. Ability to appreciate emerging technologies and tools.
- K. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
- L. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
- M. The ability to work independently on a substantial project and as an effective team member.

1.5 Programme Structure

The First Degree Programme in Commerce with Accounts and Data science (Double main) shall include:

1. Language courses
2. Foundation courses
3. Core Course I
4. Core Course II
5. Open Course

Language courses include 4 common courses in English and 2 courses in an additional language chosen by the student. The student shall choose any one of the following additional languages: **Malayalam, Hindi, Sanskrit, French, Tamil, German, Russian and Arabic.**

Foundation courses include 2 courses which are compulsory basic courses. Foundation course one aimed at providing basic education on Contemporary issues on Constitution/ Human rights and foundation course two aimed at providing basic education on Environmental Studies.

Core courses include compulsory courses in the major subject in the two mains and Open course in the 5th semester is a non-major elective offered by other programmes in the colleges to BCom students

The student secures the credits assigned to a course on successful completion of the course. The student shall be required to earn a minimum of 120 credits including credits for language courses, foundation courses, core courses, and open courses within a minimum period of six semesters for the award of the Degree including credit required for social service/ extension activities. The minimum credits required for different courses are given below:

Courses	Credits
Language courses	18
Foundation courses	5
Core courses I	46
Core Course II	48
Open Course	2
Social Service/Extension activities	1

	120
	=====

B.COM ACCOUNTS AND DATA SCIENCE – PROGRAMME STRUCTURE

SEMESTER 1

Course	Course Code	Title	Credit	Instructional Hour	
				Theory	Practical
Language		English	3	5	
Addl. Language		Malayalam/Hindi/Sanskrit/Tamil/Arabic/French/German /Russian	3	5	
Foundation 1	COA 1121	Introduction to the Indian Constitution and Human rights	3	3	
Core I	COA 1131	Financial Accounting	2	3	
Core I	COA 1132	Business Mathematics and Statistics	3	3	
Core II	COA 1141	Introduction to Data Science	4	3	3
TOTAL			18	22	3

SEMESTER 2

Course	Course Code	Title	Credit	Instructional Hour	
				Theory	Practical
Language		English	3	5	
Addl. Language		Malayalam/Hindi/Sanskrit/Tamil/Arabic/French/German /Russian	3	5	
Foundation 2	COA 1221	Environmental Studies	2	2	
Core I	COA 1231	Advanced Financial Accounting	3	3	
Core I	COA 1232	Business laws	3	3	
Core II	COA 1241	Data Analytics using Python	4	4	
Core II	COA1241.1	Python Programming LAB	2		3
TOTAL			20	22	3

SEMESTER 3

Course	Course Code	Title	Credit	Instructional Hour	
				Theory	Practical
Language		English	3	5	
Core I	COA 1331	Fundamentals of Income Tax	4	4	
Core I	COA 1332	Corporate Accounting and Auditing	4	6	
Core II	COA 1341	Database Management System and SQL	4	3	2
Core II	COA 1342	Data Mining Concepts and Techniques	4	5	
TOTAL			19	23	2

SEMESTER 4

Course	Course Code	Title	Credit	Instructional Hour	
				Theory	Practical
Language		English	3	5	
Core I	COA 1431	Taxation Laws and Accounts	4	5	
Core I	COA 1432	Cost Accounting	3	5	
Core II	COA 1441	Apache Hadoop for Data Science	4	5	
Core II	COA 1442	Data Analysis with R	4	2	
Core II	COA 1442.1	R Programming LAB	2		3
TOTAL			20	22	3

SEMESTER 5

Course	Course Code	Title	Credit	Instructional Hour	
				Theory	Practical
Core I	COA 1531	GST	4	5	
Core I	COA 1532	Computerised Accounting	2	2	
Core I	COA 1532.1	Computerised Accounting Practical	2		3
Core I	COA 1533	Internship cum project & Viva voce	4		
Core II	COA 1541	Data Visualisation for Analysis	4	5	
Core II	COA 1542	Applied Predictive Analytics	4	5	
Core II	COA 1543	Modelling using AMOS LAB	2		2
Open 1	COA 1551	Open	2	3	
TOTAL			24	20	5

SEMESTER 6

Course	Course Code	Title	Credit	Instructional Hour	
				Theory	Practical
Core I	COA 1631	Applied Cost Accounting	4	6	
Core I	COA 1632	Management Accounting	4	6	
Core II	COA 1641	Statistical Analysis System	3	4	
Core II	COA 1642	Social Media Analysis	3	4	
Core II	COA 1643	Project & Viva voce	4		5
TOTAL			18	20	5

OPEN COURSES		
Semester	Course Code	Course Title
V <i>(for students from the disciplines other than Commerce)</i>	1551.1	Fundamentals of Financial Accounting
	1551.2	Principles of Management
	1551.3	Capital Market Operations

Notes:

1. The open course offered in the fifth semester is an elective course for students from the disciplines other than Commerce. He/ She can choose any one among the courses offered in that group as part of his/ her course of study.

All courses included under Foundation Course 1, Core Course I and Open Course shall be handled by teachers in Commerce.

All courses included under Foundation Course II and Core Course II shall be handled by teachers in Data Science/Computer Application.

1.6 Practical Sessions

Practical sessions are included for all Core Courses of B. Com Programme. This shall be on a module basis and needs to be included for at least one module where learning through experiencing has maximum relevance. Evaluation will be done internally.

Objectives

1. To impart knowledge and skills on the applications of the concepts learnt in a given context.
2. To learn by experiencing and observing
3. To document and reflect upon learning
4. To develop exhibits of case studies undertaken, analysis made, exercises done and fact finding missions.

The findings will be recorded in the Commerce Lab Record (CLR) along with the learning as the final outcomes. Based on this further assessment may be made in the form of supportive assignments, seminars, group discussions, case analysis, quizzes etc. This would hammer the learning and strengthen the presentation skills of the learner.

1.7 Industrial Visit - cum Study Tour

Study tour to be mandatory for the B.Com Programme. It should cover an organization where functional applications of concepts/ theories covered in the Programme are being practiced. The visit should be pre-planned with an objective to learn identified applications like:-

Accounting processes (Computerized, Digitalized operations)

Data Science Application

Production/ Marketing/ Distribution/ Logistic Management

The total time to be devoted in the organization is two days out of **Five days** set aside for the tour. The outcome of the visit to be documented in a report with the following format

Student Tour Dairy	
1. Name of the College	
2. Name of the Student	
3. B.Com Programme	Semester
4. Name of the Organisation	
5. Date of Visit	
6. Learning Objectives	
· To Observe applications of
.....
· To Understand processes
.....
7. Interactions held
8. Outcome in the form of learning
9. Observations (along with pictures, citations, illustrations)	
Counter Signed by HoD	

1.8 Social Service/ Extension activities

Students have to participate in Extension/ NSS/ NCC or other specified social service, sports, literary and cultural activities during 3rd/ 4th semester. These activities have to be carried out outside the instructional hours and will fetch the required one credit prescribed in the total credits. The coordinators of the social/Extension activities should issue a certificate stating the active participation of students with grade (90% and above activities A Grade, 80% -90% -B, 70% - 80%- C and 50% -70% -D) and the same shall be collected and submitted to the university along with Activity Participation Consolidated List.

1.9 Audit courses (zero credit)

The students are free to do additional courses (skill based, vocational courses) prescribed by the University outside the 25 hour weekly instructional period. These courses may be taken as zero credit courses.

1.10 Attendance

The minimum number of hours of lectures, tutorials, seminars or practical which a student shall be required to attend for eligibility to appear at the end semester examination shall not be less than **75 per cent** of the total number of lectures, tutorials, seminars or practical sessions.

1.11 Evaluation

There shall be Continuous Evaluation (CE) and End Semester Evaluation (ESE) for each course. CE is based on specific components viz., attendance, tests, assignments and seminars. The CE shall be for 20 marks and ESE shall be for 80 marks. The marks of each component of CE shall be: **Attendance – 5,**

assignment / seminar –5 and test papers -10. The teacher shall define the expected quality of an assignment in terms of structure, content coverage, presentation etc. and inform the same to the students. Due weight may be given for punctuality in submission.

1.11.1 Assignments/ Seminars - Each student shall be required to do one assignment or one seminar for each course. The seminars shall be organized by the teacher / teachers in charge of CE and the same shall be assessed by a group of teachers including the teacher / teachers in charge of that course.

1.11.2 Tests For each course there shall be at least one class test during a semester. Valued answer scripts shall be made available to the students for perusal within 10 days from the date of the test.

1.12 End Semester Evaluation (ESE)

End Semester Examination of all the Courses in all semesters shall be conducted by the University. The duration of examination of all courses shall be 3 hours. In the case of the course in which Practicals are mentioned, the duration of the examination shall be 3 hours for theory and 3 hours for Practical examination

1.12.1 Evaluation of Project - The report of the project shall be submitted to the Department in duplicate before the completion of the respective semesters (fifth semester for core course I and sixth semester for core course II). There shall be no CE for project work. A Board of two examiners appointed by the University shall evaluate the report of the project work. The viva – voce based on the project report shall be conducted individually. The maximum marks for evaluation of the project shall be 75 for the report and 25 for Viva-voce = Total 100.

1.12.2 DIVISION OF MARKS (LAB EXAMINATION) FOR COREII(DATA SCIENCE)

First program	- 30 marks
Second program	- 30 marks
Viva Voce	- 10 marks
Lab Record	- 10 marks
Total	- 80 marks

1.12.2 MAJOR PROJECT EVALUATION CRITERIA FOR COREII(DATA SCIENCE)

Project report	- 50 marks
Presentation	- 30 marks
Viva Voce	- 20 marks
Total	- 100 marks

1.16 Promotion to Higher Semesters

Students who complete the semester by securing the minimum required attendance of 75% and by registering for the End Semester Examination of each semester conducted by the University shall be promoted to the next higher semester.

PART I
FOUNDATION COURSE I
CORE COURSES I (ACCOUNTS)
& OPEN COURSE

Foundation Course –COA 1121: INTRODUCTION TO THE INDIAN CONSTITUTION & HUMAN RIGHTS

Instruction Hrs: 3 Hrs per week

Total Credit: 3

Course Objectives	Teaching Learning Process	Course Outcome
The Constitution of India, 1950 is the supreme law of the land. It lays down a framework of values and institutions for the governance of the country. The purpose of this course is to increase constitutional awareness among students on the functions of the Indian Constitution and the manner in which it seeks to order social, political and economic life in India	Lecture, discussion, demonstration, assignment, field experience	<ol style="list-style-type: none">1. Understand the system of political governance in India; appreciate the intent of the Framers of the Constitution and their understanding of Constitutional Values and role of Constitutional Institutions.2. Learn the basic values of the Constitution of India as enacted in the Preamble, Fundamental Rights, Directive Principles of State Policy, and Fundamental Duties Chapter.3. Understand the democratic values that govern the functioning of three arms of government and the ancillary institutions.4. Appreciate the concepts underlying Indian federalism.5. Develop an appreciation for Human Rights values.

Course contents

Module 1: The Constitution as a Concept

(12 Hours)

Unit - I Constitution, Constitutional Law and Constitutionalism.

Unit - II Various models of constitutions (US, UK), Framing of Constitution of India, Nature of Constitution of India.

Unit – III Constituent Assembly Debates (CAD on the Form of the Constitution), Salient features of the Constitution of India.

Unit -IV Preamble and the Constitution of India.

Discussion on Contemporary Issues – Current Debates on the Parliamentary System vs. Presidential System for India; Importance of Cooperative Federalism

Module 2: Fundamental Rights and Directive Principles of State Policy

(15 Hours)

Unit - I Citizenship, State, Types of Fundamental Rights -Right to equality, Right to Freedom, Right against Exploitation, Right to Religion, Cultural and Educational Rights & the Right to Constitutional Remedies.

Unit - II Directive Principles of State Policy and Economic and Social Rights - Relationship between Fundamental Rights and Directive Principles.

Unit - III Constitutional Remedy - Enforcement of Fundamental Rights, Writ Jurisdiction (Article 32 & 226), Public Interest Litigation and Concept of Locus Standing.

Unit - IV Fundamental Duties enshrined under the Constitution of India.

Discussion on Contemporary Issues – Reservation Policy – Concerns and Challenges; MNREGS and the operation of the right to work in India; New Labour Codes and their effectiveness in promoting social and economic rights.

Module 3: Institutions of Governance

(15 Hours)

Unit - I Union & State Executive & Legislature – Powers of President, Vice President, Governor & Council of Ministers – Principles of Collective Responsibility; Union & State Legislature – Composition & Qualification of Members, Functions of Legislature

Unit - II – Judiciary - Composition, Powers and Functions of the Supreme Court of India and High Courts, Hierarchy of and lower judiciary, Judicial Independence and Accountability, Judicial Review and Constitutional Amendments – Basic Structure Doctrine.

Unit - III – Concept of Federalism and essentials of a Federal Structure, Cooperative Federalism, Union State Relations on Legislative, Administrative and Financial Matters

Discussion on Contemporary Issues – Importance of Democratic Values in Parliamentary Procedures; Role of the Governor in Centre State Relations; Misuse of the State Emergency provisions (President's Rule); Role of the Auditor and Controller General in promoting transparency in governance.

Module 4: Human Rights

(12 Hours)

Unit - I Evolution of Human Rights, Human Rights and Natural Rights, the universal character of Human Rights, Types of Human Rights – Civil and Political Rights, Economic Social and Cultural Rights, Groups Rights

Unit - II International Standard Setting on Human Rights – International Bill of Human Rights – Role and Function of UN Human Rights Council

Unit –III Overview of Powers and Functions of National Human Rights Commission, State Human Rights Commission, National Commission for SC/STs/ Backward Classes, National Child Rights Commission, National Commission for Women, National Commission for Minorities

Discussion on Contemporary Issues –Gender stereotypes operate as barriers to gender justice; Relevance of Rights of Disabled Persons

References

1. Durga Das Basu, *Introduction to the Constitution of India* (21st ed., Lexis Nexis).
2. Rashee Jain, *Textbook on Human Rights* (3rd ed., Universal Law Publishing).

Core Course –COA 1131: FINANCIAL ACCOUNTING

Instruction Hrs: 3 Hrs per week

Total Credit: 2

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none"> • To make the students to familiarize with the basics of financial accounting • To enable the students to prepare routine accounting records • To equip the students to prepare financial statements 	Lecture, discussion, demonstration, assignment, field experience	<ul style="list-style-type: none"> • The students prepare the routine records of business • The students generate financial statements of sole proprietor, partnership and nonprofit entities • The students prepare financial statements from incomplete records

Course Content:

Module 1 Introduction to Accounting

Economic activity - business - relevance of recording and reporting - origin of accounting - double entry principle - process in accounting: identifying, measuring, recording, classifying, summarizing, analyzing, interpreting and reporting - role and objectives of accounting - branches of accounting - important terms used in accounting - cash system and accrual system - classification of accounts - modern rules for debit and credit - source of documents.

4 Hrs

Module 2 Preparation of Primary and Secondary Books

Journal - Special Journal: Purchase, Sales, Return outward, Return inward, Bills Receivable, Bills Payable, Journal Proper and Cash Book: Simple, cash book with bank column and petty cash book, imprest system – Ledger: utility, posting and balancing of accounts -Trial Balance.

20 Hrs

Module 3 Preparation of Annual Financial Statements

Annual Financial Statements of sole proprietorship and partnership: Trading Account, Profit and Loss Account and Balance sheet – Adjusting entries- Annual Financial Statements of nonprofit entities: Receipt and payment account, income and expenditure account and Balance sheet

17 Hrs

Module 4 Preparation of Financial Statements from Incomplete Records

Incomplete records: reasons, limitations - calculation of profit by capital comparison - preparation of Trading Account, Profit and Loss Account and Balance sheet from incomplete records

8 Hrs

Module 5 GAAP and Accounting Standards

Accounting Principles, Concepts and Conventions - Accounting Standards: Role and objectives - Need for international accounting standards- Development of IFRS and Ind AS- Adoption or Convergence of IFRS- Definition of financial elements- assets, liabilities, expense, income, equity – Principles of recognition, measurements, presentation and disclosure.

5 Hrs

Reference Books

1. Advanced Accountancy: S P Jain and K L Narang, Kalyani Publishers
2. Advanced Accounting 1: Dr. S M Shukla and S P Gupta, Sahitya Bhavan Publications
3. Advanced Accounting Volume 1: M C Shukla and T S Grewal, S Chand Publishing
4. Advanced Accounting Volume 1: S N Maheswari Vikas Publishing
5. Financial Accounting: R L Gupta and M Radhaswamy S Chand Publishing

Suggested Reading

1. Beginner's Guide to Ind-AS and IFRS : C A Kamal Garg, Bharat Law House
2. Accounting Standards including introduction of Ind AS: Dr D S Rawat, Taxmann

Core Course – COA 1132: BUSINESS MATHEMATICS AND STATISTICS

No. of instructional hours per week: 3

No. of credits: 3

Course Objectives	Teaching Learning Process	Course Outcomes
<ul style="list-style-type: none"> • To familiarise the students with basic Mathematical tools. • To impart skill to apply mathematical tools in financial analysis • To understand statistical principles to collect, tabulate and present business data. • To inculcate methods of statistics to analyse and interpret business data, 	<ul style="list-style-type: none"> • Lecture method • Assignment • Individual and group presentation 	<ul style="list-style-type: none"> • Able to apply mathematical tools to solve general business problems. • Able to apply financial analysis with mathematical base. • Make students able to collect, tabulate and present business data. • Able to perform analysis and interpretation of business data.

Course Contents

Module 1 Number Sense: Fractions and mixed numbers and their operations, percentage, comparing and ordering fractions and decimals - changing from decimals to percentage and decimals to fractions, calculating and converting percentages, fractions and decimals, unit conversions, order of operations in mathematics, permutations and combinations (overview).

(10 hours)

Module 2 Matrix : Types of Matrix - addition, subtraction, multiplication-Determinants-minors and co-factors- ad joint- inverse of a matrix- solution of linear simultaneous equations using Cramer’s rule and inverse-application of matrix to business problems. Set theory: types of sets – operations on sets.

(11 Hours)

Module 3: Mathematics for Financial Analysis: Calculation of simple and compound interest- present and future value- calculation of time value of money- value of an annuity and present value of an annuity- dividend and interest calculation for stocks, bonds and debentures- Simultaneous Linear equations- extrapolation and interpolation with line graphs.

(12 hours)

Module 4 Introduction of Statistics: Meaning and definition of statistics-collection- sampling- methods of sampling- classification, tabulation and presentation of data, preparation of Google forms, measures of

central tenancy- calculation of arithmetic mean and median, measures of dispersion: Quartile deviation - mean deviation and standard deviation. **(11 hours)**

Module 5: Correlation : Meaning and definition – correlation and causation- types of correlation- methods of measuring correlation, Karl Pearson's coefficient of correlation and its interpretation, Probable error, Spearman's Rank correlation, Coefficient of Determination- Coefficient of concurrent deviation-application of different measures of correlation in business.

(10 Hours)

References

1. Gupta S P, Statistical Methods, Himalaya Publishing House, Mumbai.
2. Elhance.D L, Fundamentals of Statistics, Kithab Mahal, Alahabad.
3. Agarwal .B M, Business Mathematics and Statistics, Ane Books Pvt Ltd, New Delhi.
4. Richard L Levin and David S Rubin, Statistics for Management, Prentice Hall of India
5. JK Singh, Business Mathematics, Himalaya Publishing House, New Delhi
6. D C Sancheti and V K Kapoor, Business Mathematics, Sultan Chand and Sons, New Delhi
7. Martin Antony, Norman Biggs. Mathematics for Economics and Finance, Cambridge Low price edition 2000.
8. RS Bhardwaj, Mathematics for Economics and Business, Excel Books, 2010 edn.

Core Course –COA 1231: ADVANCED FINANCIAL ACCOUNTING

Instruction Hrs: 3 Hrs per week

Total Credit: 3

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none"> • To enable the students to have an application knowledge in Ind AS • To equip the students to compute depreciation in different contexts • To develop students to prepare accounts of hire purchase, branches, voyage and farm activity 	<p>Lecture, discussion, demonstration, assignment, field experience</p>	<ul style="list-style-type: none"> • The students apply accounting standards in recording and reporting of financial transactions and events • The students calculate depreciation in practical situation • The students prepare accounts of hire purchase system, Branch, Farm and Voyage

Course Content

Module1- Accounting Standards for Assets, Liabilities and Revenue

Inventories (IAS 2 and Ind AS 2) - Accounting for property, plant, equipment (IAS 16 and Ind AS 16) - Accounting for intangible assets (IAS 38 and Ind AS 38) - Accounting for impairment of assets (IAS 36 and Ind AS 36) - Accounting for borrowing costs (IAS 23 and Ind AS 23) - Investment property (IAS 40 and Ind AS 40) - Revenue from contracts with customers (IFRS 15 and Ind AS 115) - Income tax (IAS 12 and Ind AS 12) - Employee benefits (IAS 19 and Ind AS 19) - Provisions, contingent liabilities and contingent assets (IAS 37 and Ind AS 37).

15 hours

Module2- Depreciation Accounting

Meaning – methods - Fixed and diminishing balance methods –Annuity method – Depreciation fund method – Insurance policy method -Revaluation method- Estimated life and estimated resale value as per AS 6 Depreciation.

10 hours

Module 3- Accounts of Hire Purchase and Installment purchase system

Meaning – difference between Hire Purchase and Installment- Accounting entries in the books of purchaser and vendor- Default in payment- Complete and partial repossession – Installment system – Entries in the books purchaser and seller.

10 hours

Module 4: Branch and Departmental Accounting

Branch Accounts- meaning, features and types of branch accounting- accounting for the branches not keeping full system of accounts- Debtors system, Stock and Debtors system, final accounts – wholesale branch- accounting for branches keeping full system of accounts- adjustment for depreciation of fixed assets, expenses met by Head office for the branch and reconciliation- incorporation of branch Trial Balance in the Head Office books.

Departmental Accounting- meaning - features- advantages- objectives- methods of departmental accounts- allocation and apportionment of departmental expenses- difference between departmental accounts and branch accounts- inter departmental transfers- preparation of departmental trading and profit and loss account.

12 hours

Module 5- Voyage Accounting and Farm Accounting

Voyage Accounts: Meaning- Advantages- Preparation of voyage accounts- Voyage in progress. Farm Accounts: Features – Objectives- Advantages and Disadvantages- Crop Account- Cattle Accounts- Final Accounts of Farms.

7 hours

Reference Books

3. Beginner's Guide to Ind-AS and IFRS : C A Kamal Garg, Bharat Law House
4. Accounting Standards including introduction of Ind AS: Dr D S Rawat, Taxmann
5. Advanced Accountancy: S P Jain and K L Narang, Kalyani Publishers
6. Advanced Accounting 1: Dr. S M Shukla and S P Gupta, Sahitya Bhavan Publications
7. Advanced Accounting Volume 1: M C Shukla and T S Grewal, S Chand Publishing
8. Advanced Accounting Volume 1: S N Maheswari Vikas Publishing
9. Financial Accounting: R L Gupta and M Radhaswamy S Chand Publishing

Core course –COA 1232: BUSINESS LAWS

No: of Instructional Hrs per week – 3

Total Credit: 3

Course Objectives	Teaching Learning Process	Course Outcomes
<ul style="list-style-type: none"> • To develop among students an idea about Indian Business Law and Company law • To orient students about the legal environment in which a business operates and to provide students with the basic knowledge of legal principles behind contractual agreements • To familiarize the students about the salient provisions and procedures of the Companies Act 2013. • To acquaint the students with management and administration disclosure and transparency requirements of the company 	<ul style="list-style-type: none"> • Lecture • Assignment • Individual and Group Presentations • Case Study Discussions • Discussions on relevant Paper cuttings 	<ul style="list-style-type: none"> • Able to identify and understand the fundamental legal principles behind contractual agreements. • Able to appreciate the relevance of business laws to individuals and business organisations and the role of the laws in an economic, political and social context. • Able to develop in the students, acceptable attitudes and viewpoints with respect to business ethics and social responsibility. • Able to familiarise the students, exercise of proper professional and ethical responsibilities towards the potential clients and the legal system

Course Contents

Part I

Module 1: Introduction to Business law: Meaning, importance, sources and branches of law - Law of contract: Definition, nature and types of contracts -Essential elements of a valid contract – offer – acceptance – consideration - capacity of parties - free consent - legality of object and consideration - performance of contract - discharge of contract **(15 Hrs)**

Module 2: Special contracts: Law of Indemnity and Guarantee - nature of liability of surety, rights of surety, discharge of surety. Meaning and definition of guarantee - Law of Bailment and pledge - bailment definition- essential elements - rights and duties of bailer and bailee – finder of lost goods. Pledge - essentials- rights and duties of Pawner and Pawnee - Law of Agency - essentials, kinds of agents- rights and duties agent and principal - creation of agency, termination of agency contract. **(9 Hrs)**

Module 3: Sale of Goods Act 1930: Meaning of contract of sale - formation of contract of sale - Goods and their classification- condition and warranties - transfer of property in goods - performance of contract of sale - unpaid seller and his rights. **(6 Hrs)**

Part II

Module 4: Introduction to Company Law: Definition, features and types of Company - Special privileges to private company and government company –Company Incorporation - Memorandum of Association - Articles of Association - Board of Directors - Board Meetings - Board committees - Company Secretary
(15Hrs)

Module 5: Disclosure and Transparency: - Members and their rights - General Meetings – Types of Resolutions - Annual Report - Annual Return – Rules relating to interested contracts - related party disclosures – e Governance and MCA-21 -DIN and CIN - CSR - Statutory Audit, Secretarial Audit and Cost Audit.
(9Hrs)

Books Recommended

1. Kapoor. N .D, Business law, Sultan Chand and Sons
2. Legal Aspects of Business 3rd Edition, Ravinder Kumar, Cengage Learning
3. Chandha P.R, Business law gajgotia, New Delhi
4. Tulsian P.C, Business Laws, Tata McGraw-Hill publishing Co.Ltd, New Delhi
5. B S Moshal, Modern Business law,Ane books, New Delhi
6. Awathar Singh, Company Law, Eastern Law Books
7. BARE Acts: Contract Act, Sale of Goods Act, Indian Companies Act 2013
8. N.D. Kapoor, Elements of Company Law Sultan Chand and Sons, New Delhi
9. D. Chandra Bose, Business Law, PHI Learning Private Limited
10. Kuchal M C, Secretarial Practice, Vikas Publications, New Delhi.
11. Ashok K Bagrial, Company Law (12th Edition) Vikas Publishing House Pvt. Ltd.

Core course –COA 1331: FUNDAMENTALS OF INCOME TAX

No: of Instructional Hrs per week – 4

Total Credit: 4

Objectives	Teaching learning process	Course outcomes
<ul style="list-style-type: none"> • To gain knowledge about the income tax • Develop insight into the procedural aspects of computation of taxable income under the heads income from salary, house property and gains of business or profession 	<ul style="list-style-type: none"> • Lecture method • Assignments • Problem solving • Case study for computing income from salary 	<ul style="list-style-type: none"> • Acquire knowledge about the basic concepts of Income Tax and heads of income • Able to compute income from salary by considering allowances, perquisites and profit in lieu of salary • Able to compute income from house property • Able to determine taxable profit of business or profession

Course content

Module I

Introduction to Income Tax : History of Income Tax in India - Classification of Taxes – Direct and Indirect Taxes – meaning – features - advantages – disadvantages – Distinction between direct and indirect taxes - Assessee – Assessment Year - Previous Year – Person – Income – deemed income - Heads of income – Gross total income – Total income – Capital and Revenue

12 Hours

Module II

Residential status, incidents of tax and exempted income: Residential status of an individual –HUF – company –and every other persons - Practical problems on determination of residential status and incidence of tax - Incomes Exempt from Tax - Different categories of Exempted Income – Incomes which are neither included in Total Income nor Income Tax is payable – Incomes which are included in Total Income but no income Tax is payable.

12 Hours

Module III

Income from salary : salary - Wages – annuity or pension –perquisites - allowances , profit- in lieu of salary - deductions from salary – treatment of Provident Fund – computation of Taxable salary. (With Practical)

18 Hours

Module IV

Income from house property: Determination of annual value in different cases – deductions – treatment of unrealized rent – treatment of loss from house property - Items of income from house property which are not liable to tax - computation of income from house property

15Hours

Module V

Profit and gains of business and profession: Rules for assessment of business income – deductions expressly allowed – depreciation – methods of depreciations – block of assets – computation of profits and gains of business or profession.

15 Hours

Suggested Text Books

1. Direct Tax Law and Practice – Dr. H C Mehotra and Dr. S P Goyal – Sahitya Bhavan Publications
2. Direct Taxes Sri. T N Manoharan – Snow white Publications
3. Direct Taxes Law and Practice – Dr. Girish Ahuja; Dr. Ravi Gupta, Bharat Law House Pvt. Ltd. New Delhi

Reference

1. Income Tax Act and Rules
2. Income Tax, Vinod K Sinhanian & Monica Sinhanian, Taxman Publications Pvt. Ltd. New Delhi.
3. Direct Taxes, Lal B B, Konark Publishing House, New Delhi.
4. Direct Taxes – Law and practice, Bhagawathi Prasad – Wishwa Prakashana

Core Course – COA 1332: CORPORATE ACCOUNTING AND AUDIT

No: of Instructional Hrs per week – 6

Total Credit: 4

Course Objectives	Teaching Learning Process	Course Outcome
<ol style="list-style-type: none"> 1. To create awareness about corporate accounting in conformity with the provisions of Companies Act, IAS and IFRS. 2. To help the students in preparation of accounts of corporate in preparation of final accounts according to revised companies Act and according IAS – I 3. To enable the students to prepare and interpret financial statements of joint stock companies 4. To gain ability to prepare consolidated statements of group of companies 5. To provide students the knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards. 6. To familiarize students with the audit of Companies and the liabilities of the auditor. 	Lecture Assignments Group task and Presentation Explanatory Quiz Think Pair and share (TPS)	<ul style="list-style-type: none"> • Interpret the provisions in IAS and IFRS • Apply provisions of IFRS in similar situations • Prepares financial statements according to the format prescribed by the companies Act and IAS -1 • Calculate EPS and related performance indicators from the balance sheets of listed companies • Prepares consolidated financial statements of group of companies by considering the adjustments. • Appreciate the consolidated financial statements • List out the requirements of audit in companies, qualification and liabilities of company auditor.

Course content

Module I: Accounting standards-Relevance of Accounting Standards in preparation and presentation of final accounts– Indian GAAP and Global Accounting Standards-Convergence with IFRS. **(13 Hrs)**

Module II: Final Accounts of Companies and Interpretation – company statutory records – preparation of final accounts according to revised schedule III- Form and contents of Balance Sheet (Vertical form with notes), Profit and Loss account (Vertical form with notes) – preparation of final accounts according IAS – I (Form and contents of Balance Sheet - familiarization of forms only) - Profits prior to incorporation. Familiarity with AS 20 – objectives, scope, definition, presentation, measurement –Basic EPS –Diluted EPS –Diluted Potential Equity Shares –Disclosure –EBIT –EPS Analysis. **(25 Hrs)**

Module III: Consolidated Financial Statement (AS 21)

Holding Companies – Preparation of consolidated Balance Sheet – Minority Interest – Pre acquisition Profits – Cost of Control – Inter Company balance - Unrealized profits - Revaluation of assets and liabilities. **(20 Hrs)**

Module IV: Auditing Basics

Auditing Nature, Scope and Significance of Auditing – Types of Audit - Audit Engagement, Audit Program, Audit Working Papers, Audit Note Book, Audit Evidence and Audit Report - Internal Check, Internal Control, Internal Audit-Industry Specific **(20 Hrs)**

Module V: Provision relating to Audit under Companies Act

Auditor's qualifications, disqualifications, appointment, remuneration, removal, powers and duties - Cost Audit, Secretarial Audit - Reporting Requirements under Companies Act, Report vs. Certificate, contents of the reports and qualifications in the report. - Miscellaneous Audit (i) Branch Audit, Joint Audit (ii) Audit of shares and debentures (iii) Audit of divisible profits and dividends (iv) Statutory Auditors vs. Internal Auditors (v) Auditing and Assurance Standards relating to audit of inventories and audit of fixed assets (vi) Auditing of different types of undertaking – Education, Hospital, Co-operative Societies, Banks, Trusts, Municipalities, Panchayat **(30 Hrs)**

Recommended Practical —

1. Create awareness on maintenance of accounts of companies on the basis of live annual reports of companies
2. Preparation of assignments on maintenance of accounts of banks and insurance companies on the basis of visit to branches, wherever available.

References

- Asish K Bhattacharjee, Tata Mc Graw Hill, . Indian Accounting Standards
- Israr Shaikh and Rajesh Makkar, Lexis Nexis. Accounting Standards
- Rajkumar S Adukia, Lexi Nexis, Indian Accounting Standards
- Rawat D S—Taxman Accounting Standards
- Vijayakumar M.P, Snow White, Chennai - Accounting Standards
- RL Gupta and Radhaswamy- Advanced Accounting
- Dr. B D Agarwal - Advanced Financial Accounting
- M C Shukla , TS Grewal and S C Gupta - Advanced Corporate Accounting
- P C Thulsian - Advanced Corporate Accounting

Core Course – COA 1431: TAXATION LAW AND ACCOUNTS

No: of Instructional Hrs per week – 5

Total Credit: 4

Objectives	Teaching learning process	Course outcomes
<ul style="list-style-type: none"> • Provide practical skills on computation of total income and tax liability of individual, firms, co-operative society, company and HUF • Analyze the assessment procedure • Enable students to familiarizes with income tax authorities and their powers 	<ul style="list-style-type: none"> • Lecture method • Case studies for computing total income • Assignments • Group discussions 	<ul style="list-style-type: none"> • Able to compute capital gain and income from other sources • Able to determine Total income of individual, firms, co-operative society, company and HUF • Able to explain various income tax authorities and their powers • Able to compare tax planning, tax management, tax evasion and tax avoidance.

Course content

Module I

capital gain : Capital Asset – Types of capital assets - Transfer - methods of computation of capital gains – capital gains exempt from tax **15 Hours**

Module II

Income from other sources : chargeability – dividend – tax treatment of dividend – interest on securities – kinds of securities – Bond-washing transactions - interest on securities exempt from tax – Deductions permissible from income from other sources. **15 Hours**

Module III

Deductions in computing total income **15 Hours**

Module IV

Assessment of Tax liability of individuals – firms – co-operative society – company – HUF

30 Hours

Module V

Income Tax authorities and Assessment – Different Income Tax authorities – Appointment of Income Tax authorities – Jurisdiction of income tax authorities – Powers of Income Tax authorities – CBDT , Commissioners of income tax, income tax officer, inspectors – Assessing Officer - Tax management - Tax Planning - Tax evasion – Tax avoidance - Tax deducted at sources – Tax collected at sources and Advance Tax.

15 Hours

Suggested Text Books

1. Direct Tax Law and Practice – Dr. H C Mehotra and Dr. S P Goyal – Sahitya Bhavan Publications
2. Direct Taxes Sri. T N Manoharan – Snow white Publications
3. Direct Taxes Law and Practice – Dr. Girish Ahuja; Dr. Ravi Gupta, Bharat Law House Pvt. Ltd. New Delhi

Reference

1. Income Tax Act and Rules
2. Income Tax, Vinod K Sinhanian & Monica Sinhanian, Taxman Publications Pvt. Ltd. New Delhi.
3. Direct Taxes, Lal B B, Konark Publishing House, New Delhi.
4. Income Tax Act , Taxmann

Core course –COA 1432: COST ACCOUNTING

Instruction Hrs: 5 Hrs per week

Total Credit: 4

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none"> • To familiarize the students with cost and cost accounting concepts • To make the students learn cost accounting as a distinct stream of accounting • To make the student acquaint with various elements of cost. 	Lecture Discussion Demonstration Assignment, Field experience	<ul style="list-style-type: none"> • The students have better knowledge about different cost concepts • The students generate various cost accounting records • The students able to reconcile cost and financial profits.

Course Content:

MODULE I: Introduction to Cost Accounting

Meaning and definition—cost concepts—cost centre, cost unit, profit centre, cost control, cost reduction—objectives—Distinction between financial accounting and cost accounting—Methods and Techniques of costing—Advantages of Cost Accounting—Limitations of Cost Accounting—Installation of Costing System—Cost Accounting **(15 Hours)**

MODULE II: Accounting and control of material cost

Material Control—Purchase procedure- EOQ—Levels of inventory - ABC, VED and FSN analyses—JIT System— Perpetual Inventory System-Periodical inventory System—Continuous Stock taking— Materials Losses and their accounting treatment Methods of pricing issue of materials—Primary and Secondary packing materials and their accounting treatment. **(20 Hours)**

MODULE III: Accounting and control of labour cost

Time keeping - Time booking - Systems of Wage Payment - Incentive plans - Idle time - Overtime and their accounting treatment - Labour turnover - Concept of learning curve.

(15 Hours)

MODULE IV: Accounting for overheads

Classification and codification—Departmentalization (Allocation and Apportionment)—Absorption—Determination of overhead rates—under/over absorption— Accounting treatment— Allocation of overheads under Activity Based Costing. **(20 Hours)**

MODULE V: Cost Accounting records and Unit Costing

Integral and non-integral Systems—Preparation and presentation of cost sheets—Reconciliation of Cost and Financial Accounts.—Unit Costing—Tender-Quotations **(20 Hours)**

Recommended structure for preparing Question Paper: Theory-40% Problems—60%

Recommended Practicals:

1. Prepare a list of activities those come across daily, wherein cost accounting applications can be made.
2. Prepare cost sheets in respect of milk production, farming activities, hospitals nearby, margin free shops and small and tiny enterprises in any region.
3. Analyse and present consumption of various materials in the household and explore the possibility of applying inventory control techniques.
4. Prepare comparative cost sheets of products we regularly consume by using published annual accounts.

Books Recommended:

1. SP Jain and KL Narang—*Advanced Cost Accounting*, Kalyani Publishers New Delhi
2. NK Prasad—*Advanced Cost Accounting*, Book Syndicate Pvt. Ltd. Kolkata
3. MY Khan and PK Jain—*Advanced Cost Accounting*, Tata McGraw Hill
4. Thulsian PC—*Practical Costing*, Vikas Publishing House, New Delhi
5. MN Arora, *Principles and Practice of Cost Accounting* Vikas Publishing House, New Delhi
6. BM Nigam and Jain K *Cost Accounting* PHI, New Delhi
7. SN Maheswari—*Cost and Management Accounting*, Sultan Chand & Sons, New Delhi

Core Course – COA 1531: GOODS AND SERVICES TAX

Instruction Hrs: 5 Hrs per week

Total Credit: 4

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none"> • To give the students a general understanding of the GST law in the country • To provide an insight into practical aspects of GST. • To equip them to become tax practitioners. 	Lecture Discussion Demonstration Assignment, Field experience	<ul style="list-style-type: none"> • The students have better knowledge about different GST concepts • The students generate Tax Statements for various business firms. • The students are able to become independent tax practitioners.

Course contents

Module 1 - Introduction to Goods and Services

Evolution of Goods and Services Tax - Methodology of GST – Principles of GST - Taxes Subsumed under GST - Constitutional background - Benefits of implementing GST- Structure of GST- CGST - SGST - IGST - Important concepts and definitions under GST Act - Aggregate turnover, Agent, Agriculturist, Business, Capital goods, Taxable person, Casual taxable person, Non-Resident taxable person, Common Portal, Ecommerce, Composite supply, Mixed supply, Exempted supply, Outward supply, Principal supply, Place of supply, Supplier, Goods, Services, output tax, Job work, Manufacture, Input tax credit, Person, Place of business, Reverse charge, Works contract, , Export of goods / services, Import of goods / services, Intermediary - Taxable territory, Non-taxable territory **(15 hours)**

Module 2 – Registration under GST

Registration - Persons Liable for Registration - Compulsory Registration - Deemed Registration- Procedure for Registration - GSTIN - Amendment of Registration - Cancellation of Registration - Revocation of cancellation- Unique Identification Number - Registration number format. **(15 hours)**

Module3 – Levy and collection of GST

Taxable event - Procedure relating to levy and collection of CGST & SGST - Place of supply - Valuation rules - Taxability of reimbursement of expenses - Exemption from GST - Small supplies and composition scheme - Classification of goods and services - Composite and mixed supplies - Concept of time and place of supply - Import and export time of supply - Place of supply- Significance- Time and

place of supply in case of intra state supply, interstate supply and import and export of goods and services - E-way billing - Reverse Charge Mechanism- Payment of GST - Manner of payment of tax- Rates of GST - Tax Deduction at Source - Collection of Tax at Source – Refunds. **(20 hours)**

Module 4- Input Tax Credit

Cascading Effect of Taxation- Benefits of Input Tax Credit- Manner of claiming input tax credit in different situations - Recovery of Credit - Reversal of credit - Utilization of Input tax credit - Cases in which input tax credit is not available - Tax Invoice - Unauthorized Collection of Tax - Credit Notes - Debit Notes - Electronic Cash Ledger - Electronic Credit Ledger - Electronic liability ledger.

(15 hours)

Module 5- Authorities and Assessment of GST

GST council – Constitution, Structure, Power and Functions - GST authorities – Assessment, appeal and revision authorities - Offences and penalties - An overview of various types of assessment - Self assessment - Summary and scrutiny assessment- Returns - Accounts and Records- Forms of return - Special provisions relating to GST - Taxability of E-commerce - Anti-profiteering -Avoidance of dual control - E-way bills - zero-rated supply.

(25 hours)

References:

1. Indirect Taxes - Vinod K Singania, Taxmann's Publications, New Delhi
2. Indirect Taxes - H.C Mehrotra, Sahitya Bhavan Publications, New Delhi
3. Illustrated Guide to Goods and Service Tax- C A Rajat Mohan- Bharat Publications
4. All About GST- V S Datey- Taxmann Publications.
5. Beginner's Guide to GST- Dr Vandana Bangar and Dr Yogendra Bangar- Aadhya Prakashan Banagar
6. Bare Acts - CGST, SGST and IGST

Core Course – COA 1532: COMPUTERISED ACCOUNTING

No. of instructional hours per week: 5 (2 hour theory and 3 hours practical)

No. of credits: 4

Course Objectives	Teaching Learning Process	Course Outcome
<p>To update and expand the skills in the application of accounting packages.</p> <p>To expose the students to computer application in the field of Accounting.</p> <p>To develop practical skills in the application of Tally Package</p>	<ul style="list-style-type: none"> • Lecture • Practical training • Demonstration Assignment, • Case analysis 	<ul style="list-style-type: none"> • The students have better knowledge about Computerised accounting. • The students get trained in tally software. . • The students are able to become Tally professional who can also handle GST application in Accounts.

Course Contents

Module I: Company creation and set-up of accounts in Tally (8.1 or higher version) Start-up Tally, Quitting Tally, Creation of a Company, Alteration, deleting, and shut a Company - concepts of Grouping of Accounts – Predefined account groups, display or alter groups. Creating Ledger Accounts – Predefined ledger accounts, creation, display, alter and deleting ledger accounts - Inventory – items, groups, units, creating a single stock group, creating a multiple stock group, stock items. **(10 Hrs)**

Module II: Accounting vouchers and its advanced usages - Vouchers, Types of Vouchers used in Tally, Creation of Voucher type, Types of accounting Vouchers , Accounting Features, Maintaining Bill-wise Details, Cost centre and cost category, interest calculation, Reversing journals and optional voucher, Memorandum Voucher - Inventory vouchers – delivery note, physical stock voucher, purchase order, sales order, receipt note, rejection in, rejection out, stock journal, Stock category, bill-wise details, multiple Godowns, different and actual bill quantity- Working with payroll info menu- payroll configuration and pay head creation- pay roll vouchers- payroll reports. **(30 Hrs)**

Module III: Books of accounts and its advanced usages - Cash book, Bank book, Journal Register, Ledger, Purchase, Register, Sales Register, Stock item, Stock group summary, movement analysis, sales order, purchase order, location wise stock reports, stock query, branch accounting, flexible invoicing, discount in invoicing, price list, bank reconciliation, manufacturing account **(20 Hrs)**

Module IV: Financial Management - TDS, Generation and Reconciliation of TDS Challans,

Filing e-TDS return, Calculation of VAT in Tally - Fund flow, receivables turnover, budgeting and controls, variance analysis, ratio analysis, calculating key financial ratios **(20 Hrs)**

Module V: Report Generation and Printing - Display of Trial balance, profit and loss accounts, balance sheets, consolidated statements companies/branches. Printing options, quick format, printing reports, printing of primary books, printing of registers, printing of outstanding statements, printing of inventory books **(10 Hrs)**

Practicals: Application of Tally - creation of companies; creation of primary groups, secondary groups; creation of ledgers; creation of inventory – items, groups, units etc.;

Creation of different types of vouchers; bills wise details; interest calculation, creation of godowns; Preparing, display and alter books of accounts, preparing stock reports, stock query, branch accounts, invoices, and price list and bank reconciliation statement.; Creating payroll vouchers in TALLY; Generating fund flow statements, ratio analysis statements, budgets; preparation of TDS return. ; Generating Trial balance, Profit and Loss Accounts, Balance Sheets, consolidated statement of companies.

Books Recommended:

1. Institute of Computer Accountants .*Tally*, Vikas Publishing House, New Delhi.
2. Tally Academy .*Tally Manual*.
3. TALLY 9 Upto release 3.0, Computech Publications Ltd., New Delhi.

Core course – COA 1533: INTERNSHIP CUM PROJECT

Guideline and Report Format

A. Guideline

i. Objectives

- a. Introducing an organization, its organizational structure, functioning, and environment of the business to the students.

ii. Preparation

- a. Total length should be approximately 30 pages (page numbers indicated below are indicative).
- b. The report must be written in English.
- c. The title page of all students shall be in uniform format according to the template provided as appendix 1
- d. the abstract need to be written in English

The "**Internship**" aims at introducing the student to a range of professions and areas/functions within the company/organization. The student might be engaged in a rotation program between different functions, might be invited to participate in seminars and training programs, or might join one or more managers and accompany them in an apprenticeship mode. In the Internship the student's competencies are broadened through the activities he or she is engaged in.

Parties of Internship

- The Learner
- The Internship Coordinator: - who is in charge of identifying organisations and initiator of internship programme, communicator with the organisations for getting internships, and evaluator of the internship (internal evaluator)
- The Internship mentor: The faculty in charge of mentoring each student. All the faculties in the department shall function as mentor. The HoD shall finalise with the support of internship coordinator, the list of students to be guided and mentored by the faculty at the beginning of the second semester.
- HoD- the head of the department shall monitor the activities of coordinator and mentors to ensure the progress of internship programme.

During the internship

- **Work diary:** - The students should e-mail the work per day at the end of the day before 5pm. They should consult with the external mentor, should send the mail from the organization itself, if possible. Also submit a consolidation (activity report as per university guideline Performa attached)
- **Submission Deadlineday ...Month, date... 202....(year). (as per university of Kerala guidelines)**
 - **You need to submit two (2) printed copy of your report to the HoD, after getting it signed by the internal and external mentors.**
 - Depending on what is agreed in each case; you also submit agreed deliverables to the company/organization.

Oral Presentation

The students will contact the HoD for making an appointment with the Faculty Coordinator for an oral discussion of the internship and the submitted report. It will be a Q&A session, with no requirement of formal presentation.

Company/Organization Appreciation

The representative for the company will be asked to write an appreciation statement about the student's activities during the internship, including overall performance, specific strengths, any weaknesses that the student could work on improving and estimation of learning outcomes.

Evaluation and Grading

Written deliverable, face-to-face discussion and company appreciation are integrated in the final grading.

B. Indicative Structure of the Report

In the following, very general guidelines are provided for the internship report.

1. Title Page and Abstract

It is compulsory to use the language in standard form i.e. in British English. It is also compulsory to submit the report to the concerned internal mentor on the date prescribed. (The project guide and internal mentor shall be one and the same faculty in the department)

2. Executive summary (2 pages)

Key learning acquired and indication of activities undertaken.

3. Acknowledgements

Appropriate acknowledgements towards the company/organization, and other players involved in the process of the internship.

4. Table of Contents

5. Introduction (3 pages)

Presentation of the company/organization:- Description of the main activities and processes of the company/organization. Reflections on the role and importance of the function(s) that you have worked in.

6. Situation Analysis (4-5 pages)

Detailed context of the project integrating directly related literature, Internet sources etc. Depending on the context of the internship, the below can be integrated:

- Best Practices of similar situations/problems
- Analysis of external factors/drivers,
- Analysis of internal factors/drivers,
- Analysis of technology factors,
- Market considerations,
- Competitive considerations (SWOT, Porter...)

7. Key Results/Key Learning (5 pages)

Analysis of the results obtained/learning realized in an appropriate conceptual framework derived from the situation analysis.

8. Observations (4-5 pages)

- Depending on the various aspects of the company/organization that you have become acquainted with, try to make some recommendations/observations related to improvements or changes that you think would be beneficial for the company as a whole. Support them with some data (qualitative and/or quantitative).
- Implementation issues – what should the company keep in mind for successful implementation of these recommendations?

9. Conclusion (3-4 pages)

- Main learning and other "strong" aspects that the internship provided. What you have learnt and what you would like to develop more in your professional future.
- Perspective making with respect to the situation analysis (conceptual framework, best practices, models...).

10. Bibliography

Include references to books, articles, reports referred to in the report in the following format:

..... (Author/s name), (Year): (Title), (Publisher Address). (Page No.)

Indicate interviews if appropriate (person interviewed, his/her position, and date of the interview)

11. Appendices

Beware to join only material that you refer to in the report

Text Format in the Report

Times New Roman 12 or similar, 1.5 line space, Margins 2.5 all around.

Core Course-COA 1631: APPLIED COSTING

Instruction Hrs: 3 Hrs per week

Total Credit - 4

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none"> • To acquaint the students with different methods and techniques of costing. • To enable the students to apply the costing methods and techniques in different types of industries. 	Lecture Discussion Demonstration Assignment, Field experience	<ul style="list-style-type: none"> • The students are able to ascertain cost of different industries by using appropriate methods • The students have the skill to use cost accounting techniques for different managerial decisions.

Course Content:

MODULE I: Specific Order Costing

Job Costing – Meaning - Accounting procedure – Batch Costing - Meaning and accounting procedure - Economic Batch Quantity - Contract Costing – Meaning - Determination of profit or loss on Contracts - Cost plus contracts - Escalation Clause - Sub-contracts. **(20 Hours)**

MODULE II: Process Costing

Features - Treatment of Process losses and abnormal gain – Joint products and by – products - Methods of apportioning joint costs - Equivalent Production. **(20 Hours)**

MODULE III: Service Costing

Meaning—Features—Composite Cost Unit—Service Costing applied on Transport—Hospital—Power House—Canteen. **(15 Hours)**

MODULE IV: Marginal Costing

Meaning-Difference between marginal costing and absorption costing - Break Even Analysis - Cost Volume Profit Analysis - Decision making-Key factor- Make or buy—Product/Sales mix decisions—Pricing decisions—Capacity decisions. **(18 Hours)**

MODULE V: Standard Costing

Meaning—Difference between standard cost and estimated cost— Historical costing vs. standard costing—Constituents of standard cost—Analysis of Variance (Materials only – quantity, price, cost, mix and yield) **(15 Hours)**

Recommended structure for preparing Question Paper: Theory - 30% Problems 70%

Recommended Practicals:

1. Visit a coconut oil mill or similar process industries to have real feel of process industries and prepare process cost accounts using actual data.
2. Visit passenger transport or goods transport utilities and Analyse their cost structure.
3. Visit construction sites and study the pattern of contracting, subcontracting, etc and prepare contract accounts from actual figures.

Books Recommended:

1. Jain SP and Narang K.L—*Advanced Cost Accounting*, Kalyani Publishers New Delhi.
2. Prasad N. *Advanced Cost Accounting*, Book Syndicate Pvt. Ltd. Kolkata.
3. Khan M.Y and Jain P K, *Advanced Cost Accounting*, Tata McGraw Hill.
4. Thulsian P.C,*Practical Costing*, Vikas Publishing House, New Delhi.
5. Arora M.N, *Principles and Practice of Cost Accounting*, Vikas Publishing House, New Delhi.
6. Nigam B.M and Jain K,*Cost Accounting* PHI, New Delhi.
7. Maheswari. S.N,*Cost and Management Accounting*, Sultan Chand & Sons, New Delhi.

Core Course –COA 1632: MANAGEMENT ACCOUNTING

Instruction Hrs: 5 Hrs per week

Total Credit: 4

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none"> • To enable students to acquire sound knowledge of concepts, methods and techniques of management accounting • To make the students develop competence with management accounting usage in managerial decision making and control. 	Lecture Discussion Demonstration Assignment,	<ul style="list-style-type: none"> • The students able to prepare common size statement, comparative statement and Trend analysis. • The students calculate financial ratios and interpret the same • The students prepares cash flow and fund flow statements • Students apply various enterprise performance measurement tools.

Course Content:

Module I: Introduction to Management Accounting

Nature and Functions-Financial vs. Management Accounting- Cost vs. Management Accounting - Role of Management Accountant - role of management accounting in decision making. Tools and techniques of management accounting – Comparative Statement – Common size Statement – Trend Analysis

(18 Hours)

Module II: Ratio Analysis

Meaning, Advantages, Limitations, Classifications of ratios-Calculation of ratios – Current Ratio – Liquid Ratio – Stock Turnover Ratio – Debtors Turnover Ratio – Creditors Turnover Ratio – Operating Ratio – Gross Profit Ratio – Proprietary Ratio – Fixed Assets Turnover Ratio – Debt Equity Ratio – Return on Capital employed Ratio – Capital Gearing Ratio - Comments on the Basis of Ratios.

(18 Hours)

Module III: Fund flow analysis and cash flow analysis

Fund flow statement- Meaning – objectives -uses of Fund Flow statement- differences between Fund Flow Statement and Balance sheet –differences between Fund Flow Statement and Income statement-Preparation of Fund Flow Statement. Cash Flow statement– meaning- objectives and uses-differences between Cash Flow Statement and Fund Flow Statement- Preparation of Cash Flow Statement.

(18 Hours)

Module IV: Budgetary Control

Meaning –Nature and functions-Preparation of Different Types of Budgets, Fixed Versus Flexible Budgeting - uses – functional budgets – cash budget – flexible budget – meaning and concept of master budget. **(18 Hours)**

Module V: Enterprise Performance Measurement Tools

ROI- Residual Income – Economic Value Added – Market Value Added – Balanced Score Card. **(15 Hours)**

Recommended structure for preparing Question Paper: Theory - 30% Problems 70%

Recommended Practical: Students are expected to Analyse live cases of cost and management accounting reports attached to Annual Reports and make a presentation in the class.

Books Recommended: *Note: Latest edition of text book may be used.*

1. Lal, Jawahar. *Cost Accounting*. Tata McGraw Hill Publishing Co., New Delhi.
2. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*, Tata McGraw Hill Co. New Delhi
3. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
4. Man Mohan, Goyal S.N. *Principles of Management Accounting*, Sahitya Bhawan Publications, Agra.
5. Shashi K.Gupta and Sharma R.K. *Management Accounting*, Kalyani Publishers, New Delhi.
6. Gupta S.P and Sharma R.K. *Management Accounting*, Sahitya Bhawan Publications, Agra.
7. Kulshustia and Ramanathan. *Management Accounting*, Sultan Chand & Sons, New Delhi.
8. Maheswari S.N. *Management Accounting and Financial Control*, Sultan Chand & Sons Delhi.
9. Shukla, M.C., T.S. Grewal and M.P. Gupta. *Cost Accounting, Text and Problems*. S. Chand & Co. Ltd., Delhi.
10. Pandey I.M *Principles of Management Accounting*, Vikas Publishing House, New Delhi.
11. Khan M.Y & Jain P.K. *Management Accounting*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
12. Revi M. Kishore. *Management Accounting*, Taxman Publications Pvt.Ltd., New Delhi.
13. Jain, S.P. and K.L. Narang. *Cost Accounting, Principles and Methods*. Kalyani Publishers, Jalandhar.

Open Courses (For students from disciplines other than Commerce)

Open Course I: COA 1551.1- FUNDAMENTALS OF FINANCIAL ACCOUNTING

Instruction Hrs: 3 Hrs per week

Total Credit: 2

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none">To provide basic accounting knowledge as applicable to business.To form a background for higher learning in financial accounting	Lecture Discussion Demonstration Assignment	<ul style="list-style-type: none">Enable the students to acquire knowledge in the basic principles and practices of financial accounting.Equip the students to maintain various types of ledgers and to prepare final account

Course Content

Module I: Introduction to financial accounting – Accounting – meaning, objectives – accounting concepts and conventions – systems of accounting. Accounting Standards – meaning and objectives. Double entry book keeping – basic concepts – rules of debit and credit.

Module II: Recording Business Transactions – Journal – Ledger – Subsidiary books.

Module III: Cash book – Simple cash book, cash book with cash and discount columns, cash book with cash, discount and bank columns – Petty Cash Book – Bank Reconciliation Statement.

Module IV: Trial Balance – meaning and objectives – preparation of Trial Balance – Rectification of errors – Types of errors – detection and rectification of errors – Suspense Account.

Module V: Financial Statements – Final accounts of sole trader – Manufacturing, Trading and Profit and Loss Account – Balance Sheet – Preparation of final accounts with adjustments.

Books Recommended:

1. Naseem Ahmed, Nawab Ali Khan and M.L. Gupta. *Fundamentals of Financial Accounting – Theory and Practice*, Ane Books Pvt. Ltd., New Delhi.
2. Krishnankutty Menon M. and George Chakola. *Principles of Book-Keeping And Accountancy*, Sahitya Bhawan Publications, Agra.
3. Gupta R.L. and Gupta V.K. *Principles and Practice of Accountancy*, Sultan Chand & Sons, New Delhi.
4. Jain S.P. and Narang K.L. *Basic Financial Accounting*, Kalyani Publishers, New Delhi.
5. Maheswari S.N and Maheswari S.K. *Advanced Accounting-Vol.I*, Vikas Publishing House, New Delhi.

Open Course: 1 - COA 1551.2 PRINCIPLES OF MANAGEMENT

Instruction Hrs: 3 Hrs per week

Total Credit: 2

Course Objectives	Teaching Learning Process	Course Outcome
To familiarise the students from other faculties on the framework of management.	Lecture Discussion Demonstration Assignment	Enable the students to acquire knowledge on the fundamentals of management principles and functions.

Course contents

Module 1 - Introduction to Management : - Meaning and definition, scope, importance, management and administration, management levels- Management- science, art or profession- Henry Fayol's principles of management.

Module 2- Planning: - Meaning, objectives, types of plans, steps in planning and limitations of planning.

Module 3- Organising: - Concept, significance, types- formal and informal, line and staff and functional, centralisation, decentralization, delegation and departmentation.

Module 4 - Staffing: - Importance, sources of recruitment and selection, training and development. (Conceptual framework only).

Module 5 - Directing and controlling : - Meaning and elements of direction -Controlling- Meaning - steps-. Methods of establishing control.

Books recommended:

1. Koontz.O. Donnel, Principles of management, Tata Mc grawhill, publishing co, New Delhi.
2. L. M. Prasad, Principles of Management, Sultan Chand & sons, New Delhi.
3. R.C. Bhatia, Business organisation and management, Ane books, P. Ltd. New Delhi.
4. Tripathy Reddy, Principles of Management Tata Mc Graw Hill Publishers, New Delhi.

Open Course 1. COA 1551.3 CAPITAL MARKET OPERATIONS

Instruction Hrs: 3 Hrs per week

Total Credit: 2

Course Objectives	Teaching Learning Process	Course Outcome
<ul style="list-style-type: none">To create an interest among students towards stock market investment	Lecture Discussion Demonstration Assignment	<ul style="list-style-type: none">To familiarize the students with capital market operations.

Course Contents

Module I: Capital Market Meaning – structure- capital market instruments (Brief discussion only) – Primary market (Meaning) – Methods of public issue – Book building – meaning – procedure

Module II: Secondary Market – Leading stock exchanges in India – Securities traded in the stock exchange – ownership and creditor ship securities (Concept only) – Procedure for buying and selling securities – Types of orders – Online trading – Stock market indices (Meaning)

Module III: Dematerialization of Securities – meaning –advantages of dematerialization – Depositories – functions of depositories – Procedure of dematerialization.

Module IV: Types of investors – Speculation Vs Investment – Types of speculators.

Module V: Derivatives – Meaning – Forwards – Futures – Options – Put option - Call option

Books Recommended

1. Kevin S. *Security Analysis and Portfolio Management*, PHI, New Delhi.
2. Preethi Singh. *Dynamics of Indian Financial System*, Ane Books Pvt. Ltd., New Delhi.
3. Sojikutumar.K and Alex Mathew. *Indian Financial System and Markets*, Tata McGraw-Hill Publishing Co.Ltd. New Delhi.
4. Bharathi V. Pathak. *Indian Financial System*, Pearson Education, Noida.

PART I
FOUNDATION COURSE II
CORE COURSES II (DATA SCIENCE)

INTRODUCTION TO DATA SCIENCE

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember data analytics life cycle
	Understand Data pre-processing concepts
	Apply probability theory for data analysis
	Analyse data using worksheet
	Evaluate formulas with Tables
	Create charts for analysis

COURSE CONTENT

Module 1: Fundamentals of Data Science: Introduction, Why data science? Data Analytics life cycle, Types of Data analysis, Types of jobs in data analytics, Data Science tools, Areas of study in data science, Role of SQL in data science, Pros and Cons of data science. **Data Pre-processing:** Introduction, data types and forms, possible data error types, Various data pre-processing operations.

Module 2: Data plotting and Visualization: Introduction, Visual encoding, Data Visualization software and libraries, Basic, specialised and advanced data visualization tools, Visualization of geospatial data, Data visualization types. **Statistical data analysis:** Role and kind of statistics, Descriptive statistics, Probability theory

Module 3: Data Analysis with worksheet-Ranges and Tables-Data Cleaning with Text Functions, Containing Date Values and Containing Time Values; Conditional Formatting; Sorting and Filtering; Subtotals with Ranges; PivotTable

Module 4: Quick Analysis ; Lookup Functions; Data Visualization-Band Chart, Thermometer Chart, Gantt chart, Waterfall Chart, Sparkline and Pivot Charts; Formula Auditing; Inquire;

TEXT BOOKS

- ✓ Gypsy Nandi and Rupam Kumar Sharma, Data Science fundamentals and practical approaches, BPB Publication, First Edition, 2020
- ✓ Bernd Held, Excel Functions and Formulas, BPB Publications.

ENVIRONMENTAL STUDIES (FOUNDATION COURSE)

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember environmental policies
	Understand different eco systems, environmental movements
	Understand types of natural resources
	Remember the causes and impacts of mining
	Understand bio diversity and conservation
	Understand environment pollution

COURSE CONTENT

Module 1: Introduction to environmental studies: Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. **Ecosystems :** What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession.

Module 2: Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water, Heating of earth and circulation of air; air mass formation and precipitation, Energy resources: Renewable and non-renewable energy sources, use of alternate, energy sources, growing energy needs

Module 3: Biodiversity and Conservation: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; Endangered and endemic species of India , Threats to biodiversity: habitat loss, poaching of wildlife , man-wildlife conflicts, biological invasions ; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services : Ecological, economic, social, ethical, aesthetic and Informational value. Environmental **Pollution:** Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution, Nuclear hazards and human health risks, Solid waste management: Control measures of urban and industrial waste, Pollution case studies.

Module 4: Environmental Policies & Practices : Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; International agreements; Montreal and Kyoto protocols and conservation on Biological Diversity (CBD). The Chemical Weapons Convention (CWC). Nature reserves, tribal population and rights, and human, wildlife conflicts in Indian context **Human Communities and the Environment:** Human population and growth: Impacts on environment, human health and welfares, Carbon foot-print, Resettlement and rehabilitation of project affected persons; case studies, Disaster management: floods, earthquakes, cyclones and landslides, Environmental movements: Chipko, Silent valley, Bishnios of Rajasthan, Environmental ethics: Role of Indian and other religions and cultures in environmental conservation, Environmental communication and public awareness, case studies

REFERENCES

- Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
- Gadgil, M., & Guha, R.1993. This *Fissured Land: An Ecological History of India*. Univ. of California Press.
- Gleeson,B. and Low, N. (eds.) 1999. *Global Ethics and Environment*, London, Routledge.
- Gleick, P.H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
- Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. *Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.
- Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339: 36-37.
- McCully, P.1996. *Rivers no more: the environmental effects of dams* (pp. 29-64). Zed Books.
- McNeil, John R. 2000. *Something New Under the Sun: An Environmental History of the Twentieth Century*.

Assignment/Field work

- Visit to an area to document environmental assets; river/forest/flora/fauna, etc.
- Visit to a local polluted site – Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-pond, river, Delhi Ridge, etc.

DATA ANALYTICS USING PYTHON

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember features of python
	Understand the control flow statements
	Understand numpy and pandas library
	Understand data structures
	Understand visualization of variables
	Create user defined modules

COURSE CONTENT

Module 1 – Introduction: Features of Python, Variables, output, input in Python, Operators, **Control flow statements:** Decision making structures, Loops, Nesting of conditional statements and loops, abnormal loop termination, errors and exception handling, user-defined functions

Module 2: Data Structures: List, Tuples, Dictionary, **Modules:** In-built modules and user defined modules. **Numpy library for arrays:** One-dimensional and multi-dimensional

Module 3: Pandas library for data processing: Basics for data frame, import of data, functions of data frame, data extraction, Group by functionality, creating charts for data frame, missing values.

Module 4: mat plot lib library for visualization; seaborn library for visualization: Visualization for categorical variable, visualization of continuous variable.

TEXT BOOK

1. Bharat Motwani, Data Analytics using Python

REFERENCES

1. Jeeva Jose, Taming Python by Programming, Khanna Publishers, New Delhi, 2016.
2. https://www.w3schools.com/python/numpy_intro.asp
3. <https://www.tutorialspoint.com/matplotlib/index.htm>
4. https://www.tutorialspoint.com/python_pandas/index.htm

PYTHON PROGRAMMING LAB**SAMPLE LAB EXERCISES**

1. Programs using Python strings, lists, tuples, and dictionaries.
2. Read and write data from/to files in Python.
3. Programs to demonstrate creating and handling of modules and packages
4. Programs involving regular expressions
5. Programs to draw simple bar chart, pie chart, histogram and scatterplot
6. Create a python program to draw a Histogram, Column Chart, Box plot chart, Pie Chart, and Scatter plot using pandas and mat plot lib.
7. Create a python program to export data (store Data Frame in CSV Format)
8. Create a python program to handle the missing data from a dataset using numpy and pandas.
9. Create a python program to import data from any .csv file and analyze using the statistical functions of pandas tools
 10. (a) Create a python program to draw a Histogram, Column Chart, Box plot chart, Pie Chart, and Scatter plot using pandas and mat plot lib for the following data. The categorical data on 1997 U.S. Health Care Expenditures. The data are in file healthexpendituresdata.csv.
 - (b) The monthly data on the total return from the Standard and Poor 500 stock index (with reinvestment of dividends) from 1970 to 2018. The data are in file SandP500stockpricedata.csv. Create a python program to import data from any .csv file and analyze using the statistical functions of pandas tools. Also create a python program to draw different charts.
 - (c) If at the end of each month, a saver deposited \$100 into a savings account that paid 6% compounded monthly, how much would he have at the end of 10 years? Create a python program to calculate it?

	A	B
1	Category	Expenditures
2	Hospital	371
3	Physician	218
4	Drugs and Supplies	109
5	Other Personal	92
6	Nursing Home	83
7	Dental	51
8	Admin & Insurance	50
9	Public Health	39
10	Home Health	32
11	Research	18
12	Construction	17
13	Eye and Equipment	14

(d) Draw a pie chart and other charts that shows the amount of subscription generated for Indian Bonds from different categories of Investors. Create a python program for the above problem Use pandas and mat plot lib to draw charts

(e) The share holding pattern of a company WIPRO is given. Create a python program for the above problem. Use pandas and mat plot lib to draw charts.

DATABASE MANAGEMENT SYSTEM AND SQL

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember components, advantages and disadvantages of DBMS
	Understand data processing concepts
	Apply different normal forms to suitable databases
	Analyse different data models
	Understand relational calculus
	Create queries for relational operations

COURSE CONTENT

Module 1: BASIC CONCEPTS: Introduction to databases – Conventional file Processing – Data Modeling for a database – Three level architecture – Data Independency – Components of a Database Management System (DBMS) – Advantages and disadvantages of a DBMS – System Environment – Users of DBMS – Transaction Management.

Module 2: DATA MODELS: Introduction – Conceptual data modeling – Motivation - Entities , entity types, various types of attributes, relationships, relationship types - E/R Diagram(ERD) notation - Generalization – Aggregation – Conversion of ERD into relational schema – Introduction to Network data model and Hierarchical data model.

Module 3: RELATIONAL DATA MODEL: Introduction – Keys, relational algebra operators: selection, projection, cross product, various types of joins, division, examples, tuple relation calculus, domain relational calculus. **RELATIONAL DATABASE MANIPULATION:** **Structure d** Query Language (SQL) - Basic data retrieval – nested queries - correlated and uncorrelated - SQL Join – Views.

Module 4: DATABASE DESIGN THEORY: Functional dependencies – Normal forms - Dependency theory - Functional Dependencies(FD) – Armstrong's axioms for FDs - Closure of a set of FDs, Minimal covers – 1NF, 2NF, 3NF and BCNF - Join dependencies and definition of 5NF – Examples.

TEXT BOOKS

- Silberschatz A., Korth H. and Sudarshan S., —Database System Concepts, McGraw Hill, 2011.

REFERENCE

- Elmasri R. and Navathe S.B, Fundamentals of Database Systems, Pearson Education, 2011.
- Raghu Ramakrishnan and Johannes G, Database Management System, McGraw Hill, 2010.

SAMPLE LAB EXERCISES

1) Create a Student table for the following fields: Roll No., Student Name, Marks of three subject

- a. Insert Five Records.
- b. Calculate Total Marks and Percentage of Marks of each student.
- c. Display maximum mark
- d. Display all records in ascending order of Student Names
- e. Calculate average of marks
- f. List all students who got less than 40% marks
- g. List all students who got more than 90% marks
- h. Increase 8 marks for the students where average is less than 40 i.

Display all records in ascending order of total marks

- j. Delete a student

2) Create a Supplier table for the following fields, Supplier ID (primary key), Supplier

Name, Item, Quantity and Price

- a. Insert five records
- b. Display Supplier ID and Supplier Name whose name starts with 'A'
- c. Increase the price of one item by some amount
- d. Display the names of suppliers who supply the same items
- e. Add a new column called Phone Number
- f. Delete a record whose Quantity is 1
- g. Display only Supplier ID and Supplier Name
- h. Display the record in the descending order of price for each item
- i. Display the records of suppliers who supply other than some item/s
- j. Display all records

3) Create an Employee table for the following fields, Employee ID, Employee Name, Date of Birth,

Designation, Salary, Date of Joining

- a. Insert five records
- b. Display the employees who have joined after 2000
- c. Display the record who have highest salary
- d. Display total salary of the employees
- e. Display name of employees in upper case
- f. Display the record of an employee who has highest experience
- g. Increase the salary of the employees by 3000 whose designation is Administrator
- h. Display the records of the employees whose salary is more than the average salary
- i. Delete one record
- j. Display all records

4) create two tables Employee (Employee ID, Employee Name, Department ID, Designation, and Date of Joining) and Department (Department Name and ID). Constraints: Emp ID is primary key and Dept ID is foreign key

- a. Insert five records
- b. Display the fields Emp ID, Emp Name, Dept ID and Dept Name
- c. Display all employees in some department
- d. Display the employees who joined in the month of March
- e. Insert a department in Department table
- f. Insert two employees in the above department in Employees table
- g. Delete a record from Department table
- h. Delete a record from Employee table
- i. Display all the employee details along with their work experience in the company till current date
- j. Display all the employees whose salary is between 25000 and 35000

5) Create a Library table with the following fields, Book ID, Book Name, Author, Purchase Date, Publisher, Price

- a. Insert five records
- b. Display the list of authors of books of a particular publisher
- c. Count the total number of books of a particular publisher
- d. Display the books in ascending order of purchased date
- e. Update any one of the fields name
- f. Insert a new column 'Year of Publish' of the book
- g. Increase the number of copies of a particular book
- h. Delete a record
- i. Insert five more records
- j. Display all records whose price is between 500 and 800

DATA MINING CONCEPTS AND TECHNIQUES

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember fundamentals of data mining
	Understand need for pre-processing
	Understand data integration, transformation and reduction
	Analyse classification and prediction models
	Understand KNN and support vector machine
	Create association rules

COURSE CONTENT

Module 1: Basics of data mining: definition of data, information and data analysis, fundamentals of data mining, data mining stages, Applications of data mining, Data Pre-processing: Need for Pre-processing the Data, Data Cleaning

Module 2: Data Integration and Transformation, Data Reduction, Introduction to data warehouse and business intelligence.

Module 3: Classification models: Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, KNN, Bayesian Classification, neural networks, Support Vector Machines

Module 4: Association rules mining: Mining Frequent Patterns, Associations and Correlations : Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis

TEXT BOOK

- Han, J., Pei, J., & Kamber, M. (2011). *Data mining: concepts and techniques*. Elsevier.

REFERECES

- Hall M, Frank E, Holmes G, Pfahringer B, Reutemann P & Witten, I.H(2009), The WEKA data mining software: an update. *ACM SIGKDD explorations newsletter*, 11(1), 10-18.
- Gupta, G.K (2014) Introduction to Data Mining with Case Studies, 2014, Prentice Hall India.

APACHE HADOOP FOR DATA SCIENCE

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember advanced map reduce API concepts
	Understand data processing in Hadoop
	Apply Hive to YARN administration
	Analyse Hadoop User Environment
	Understand HDFS, NoSQL and Apache Spark
	Create cluster management system using Apache Ambari

COURSE CONTENT

Module 1: Introduction to Hadoop, Understanding the Hadoop Distributed File System (HDFS) Getting Data into Hadoop, Understanding Data Processing in Hadoop.

Module 2: Advance d Map Reduce API Concepts, Introduction to Apache Pig, Advanced Pig Usage, Introduction to Apache Hive, Advanced Hive Usage YARN Administration.

Module 3: SQL on Hadoop Overview, The Hadoop Ecosystem, Cluster Management using Apache Ambari, Scaling Hadoop, Advanced Cluster Configuration, the Hadoop User Environment (HUE).

Module 4: Advance d HDFS, Securing Hadoop, Troubleshooting Hadoop, Integrating Hadoop into the Enterprise, Hadoop in the Cloud, Introduction to NoSQL, Introduction to Apache Spark.

TEXT BOOK

- Hadoop In 24 Hours Sams Teach Yourself.

DATA ANALYSIS WITH R

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember primitives of R
	Understand Basic Data Types, Data Structures, Control Structures, Functions
	Apply large data set with R
	Analyse data using R
	Understand functional programming and operations
	Create a R Package

COURSE CONTENT

Module 1: Introduction to R Programming: Basic Interaction with R, Using R as a Calculator, functions, Control Structures, factors, data frames, Data pipe lines, coding and naming conventions. Data Manipulation: Reading Data, Manipulating and tidying Data with dplyr

Module 2: Visualizing Data: Basic Graphics, The Grammar of Graphics and the ggplot2 Package, Figures with multiple plot, working with Large Datasets **Expressions**, Basic Data Types, Data Structures, Control Structures, Functions, Recursive Functions

Module 3: Advanced R Programming, Working with Vectors and Vectorizing Functions, Advanced Functions, Functional Programming, Function Operations: Functions as Input and Output, Building an R Package: Creating an R Package, R oxygen

Module 4: exploratory data analysis using R functions –sqrt, range, sort, minimum, maximum, median, average, standard deviation, skewness, variance. Correlation and co-variance between variables, Power tests- Bivariate analysis-Paired sample t-test, t-test to compare means-one mean and two means. One factor ANOVA comparing means across several groups, 2-way ANOVA. Simple linear regression.

TEXT BOOK

- Thomas Mailund, Beginning Data Science in R, Data Analysis, Visualization, and Modelling for the Data Scientist, APress
- Keen, K. J. (2010). Graphics for statistics and data analysis with R. CRC Press.

REFERENCES

- Tony Fischetti, Data Analysis with R,
- Joseph Schmuller, Statistical Analysis with R for dummies.

R PROGRAMMING LAB

SAMPLE LAB EXERCISES

1. Find roots of a quadratic equation using R program.
2. Calculate simple interest by creating function in R program.
3. Copy spread sheet data to clipboard and from clipboard transfer to table. Sort the data in ascending order; find average and standard deviation. [Hint `dat <- read.table("clipboard", header=TRUE)`].
4. Read the student name and mark from a text file and store in a table. Find maximum, minimum, average, median and standard deviation of marks. Display histogram and barplot.
5. Read the salesman name and sales amount from a CSV file. Display the average and standard deviation of sales. Visualize using plot and box plot of the sales amount. Inspect the boxplot and comment on the presence of outliers.
6. The profit of a company on five products is given. Find average profit of the company using R function. Plot the data using plot, hist and pie graphs. Write the screen output to text files [Hint: use the function `sink()`].
7. Create dataset of age of 50 students using `rnorm()` with `n=50`, `mean=3.1` and `sd=0.04` and conduct one sample t-test at significance level of 0.05, to check the validity of the statement “the average age of students joining the play school is 3 years”. Display hist diagram. Interpret the result.
8. A table contains expenditure and profit of a company. Conduct Pearson correlation test using R to find the correlation of expenditure on profit. Display data using line graph using `ggplot()`
9. A shopkeeper has data on the sales per day of one month. He introduced a new scheme in the next month. He want to check whether there is any significant differences in average sales of the current month and the previous month. Display boxplot for both the data and interpret the result [Hint create suitable dataset using `rnorm()` and conduct 2 Sample t-test].
10. Crop yield and quantity of fertilizer used in an agricultural field is given. Conduct one way ANOVA test to check whether the quantity of fertilizer used has any impact on the crop yield. Interpret the result.

DATA VISUALIZATION FOR ANALYSIS

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember physical and abstract types
	Understand Visualization, data maps, time series
	Apply design for visualization
	Analyse different data and image models
	Evaluate exploratory data analysis
	Understand text visualization

COURSE CONTENT

Module 1: Value of visualization: What is visualization? – Why create visualizations? – Conveying information to others – Telling stories with data – Data checking and verification - Data Maps – Time series – Graphical excellence.

Module 2: Data and Image Models: Visualization reference model – data: physical and abstract types – metadata, semantics, conceptual data – properties of images – conceptual model – relational data model – statistical data model, dimensions and measures – Roll-up and Drill-down – Visual encoding and sign systems - Multidimensional Data -Large design space.

Module 3: Design of Visualization: Visual encodings, mapping data to image – Design criteria , expressiveness, effectiveness – Data transformation – Presentation, titles, captions, annotations legend and grid lines- Testing designs – Graphical integrity – Charting, Bar chart, Line chart, Dot plot, Tables, Heat-maps - Data-based grids – Multi-functioning labels.

Module 4: Exploratory Data Analysis: EDA vs Classical Data analysis – Goals of EDA – Assumptions– Data diagnostics – Statistical models into graphics – Confirmatory analysis – Hypothesis formulation – Testing procedure, significance – Graphical inference. **Text visualization:** Text data; documents, SMS, tweets, logs, tags - Word clouds, word trees and tag clouds – Theme visualization – Topic modeling –Seriation, Quantification.

REFERENCES

1. Tufte, E(2005). *Envisioning Information*, E. Tufte. Graphics Press, 2005.
2. Tamara Munzner, *Visualization Analysis and Design*, CRC Press, 2014.
3. Nathan Yau, *Visualize This- The Flowing Data Guide to Design, Visualization, and Statistics*, Wiley, 2011.
4. Scott Murray, *Interactive Data Visualization for the Web*, O’Reilly, 2013.
5. Colin Ware, *Visual Thinking for Design*, Morgan Kaufman, 2008.

APPLIED PREDICTIVE ANALYTICS

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember Mean, Standard Deviation, Skewness, Kurtosis, Rank-Ordered
	Understand predictive analytics
	Apply data for predictive modelling
	Analyse measures of success for predictive models
	Evaluate data visualisation for different dimensions
	Create decision trees for modeling

COURSE CONTENT

Module 1: Overview of Predictive Analytics - What Is Analytics? What Is Predictive Analytics? - Supervised vs. Unsupervised Learning, Parametric vs. Non-Parametric Models, Business Intelligence, Predictive Analytics vs. Business Intelligence, Similarities between Business Intelligence and Predictive Analytics, Predictive Analytics vs. Statistics, Statistics and Analytics , Predictive Analytics and Statistics Contrasted, Predictive Analytics vs. Data Mining, Who Uses Predictive Analytics? Challenges in Using Predictive Analytics, Obstacles in Management, Obstacles with Data, Obstacles with Modeling, Deployment

Module 2: Defining Data for Predictive Modeling, Defining the Columns as Measures, Defining the Unit of Analysis, Which Unit of Analysis? Defining the Target Variable, Temporal Considerations for Target Variable, Defining Measures of Success for Predictive Models, Doing Predictive Modeling Out of Order.

Module 3: Data Understanding-What the Data Looks Like, Single Variable Summaries – Mean, Standard Deviation, The Normal Distribution, Uniform Distribution, Skewness, Kurtosis, Rank- Ordered Statistics, Categorical Variable Assessment, Data Visualization in One Dimension, Histograms, Multiple Variable Summaries - Hidden Value in Variable Interactions: Simpson’s Paradox, The Combinatorial Explosion of Interactions, Correlations, Spurious Correlations , Crosstabs, Data Visualization, Two or Higher Dimensions - Anscombe’s Quartet, Scatterplot Matrices.

Module 4: Predictive Modeling - Decision Trees, Building Decision Trees, Decision Tree Splitting Metrics, Decision Tree Knobs and Options, Logistic Regression

TEXT BOOK

Dean Abbot, Applied Predictive Analytics, Principles and Techniques for the Professional Data Analyst, Wiley

MODELLING USING AMOS LAB

SAMPLE LAB EXERCISES

1. Construct a data set to Analyse the score of a student in an entrance test using the variables gender, income of parents, time spent for coaching, marks in qualifying exam and score in the entrance test.
 - a) Analyse the impact of income of parents, time spent for coaching, marks in qualifying exam on score in the entrance test
 - b) Identify the covariance and correlation between the variables time spent for coaching and marks in qualifying exam
 - c) Display the minimization history and standardised estimates as text output
2. Construct a data set to analyse the profit of companies using the variables No. of Stores, No. of Employees and average salary of employee, profit etc
 - a) Construct a path diagram to predict the profit as a combination of other variables
 - b) Test the normality of the data set.
 - c) Find the correlation between average salary of employee and profit, display the correlation of estimates.
 - d) Display the graphic output and copy the path diagram to MS Word
3. Construct a data set to analyse sales of a company using the variables mode of marketing, amount spent for marketing, demand and supply.
 - a) Construct path diagram and determine the correlation and covariance between the variables the amount spent on marketing and demand
 - b) Find the impact of each mode of marketing on demand
 - c) Display minimization history and standardised estimates
 - d) Display the output as excel table output
4. Construct a data set which stores details such as age, annual income, education, job experience in years and gender.
 - a) Identify the impact of education and job experience on annual income
 - b) Find the impact of education and job experience on annual income for male and female separately
 - c) Display the output as Excel table format
5. Prepare a data set to store the details regarding a pandemic in the world such as continent, type of country (developing, developed, under developed), Climate (Cold/moderate etc.), number of cases and number of deaths
 - a) Identify the impact of continent, climate on the number of cases and deaths
 - b) Find the correlation and covariance between number of cases and deaths
 - c) Display minimization history, squared correlation of estimates
6. Construct a data set to store the details such as direct expenses, indirect expenses, direct income, indirect income and profit of a company.
 - a) Analyse the impact of direct expense and indirect expense on profit
 - b) Display the minimization history, squared correlation of estimates
7. Create a data set to predict the rain fall using the data regarding temperature, humidity, wind etc., analyse the impact of humidity on rainfall rate. Also analyse the correlation between temperature and humidity. Display minimization history and display the output in Excel table format.
8. Create a data set to analyse the impact of fuel price etc on stock prepare a data set. Display the relevant analysis reports.
9. Prepare a data set analyse the profit and loss account of a company for the last 20 years and display relevant analysis reports
10. Prepare a data set analyse the trading account of a company for the last 20 years and display relevant analysis reports

STATISTICAL ANALYSIS SYSTEM SAS

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember conditional statement assignments
	Understand SAS data set structure and methods of reading data into SAS
	Understand read and store data
	Understand append and merge data set
	Understand SAS support statements
	Create permanent SAS data set using windows

COURSE CONTENT

Module 1: Getting data into SAS: using SAS data set, understanding SAS data set structure, rules for SAS variable names, understanding SAS variable types, methods of reading data into SAS, going deeper: more techniques for entering data

Module 2: Reading, writing, and importing data: working with SAS libraries and permanent data sets, creating permanent SAS data sets using the windows file name technique, creating permanent SAS data sets using an SAS library, creating a SAS library using a dialog box, creating a SAS library using code, using data in permanent SAS data sets, importing data from another program, discovering the contents of an SAS data set, understanding how the data step reads and stores data

Module 3: Labelling variables with explanatory names, creating new variables, using if-then-else conditional statement assignments, using drop and keep to select variables, using the set statement to read an existing data set, using proc sort, appending and merging data sets, using proc format, finding first and last values

Module 4: Understanding SAS support statements, understanding proc statement syntax, using the id statement in a SAS procedure, using the label statement in a SAS procedure, using the where statement in a SAS procedure, using proc print, going deeper: splitting column titles in proc print, common system options

TEXT BOOK

- Alan C. Elliott, Wayne A. Woodward, SAS Essentials, Wiley, Second Edition

SOCIAL MEDIA ANALYTICS

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Remember web crawling, data aggregation
	Understand foundations of analytics
	Understand the analytics process
	Analyse data integration tools
	Understand types of analytics in social media
	Create a plan to shape data

COURSE CONTENT

Module 1: Social media data : the foundation for analytics, Evaluation of Data, Social media data sources –offline, online, Defining social media data, data sources in social media channels, public and private data, data gathering in social media analytics, social media network support of data collection – API, web crawling.

Module 2: From data to insights: key - Actionable, metric, creating a plan to shape data, choosing a good analytical tool, data aggregation, calculation and display, Social Media and Big Data

Module 3: Defining Analytics in Social Media and Types of Analytics Tools: Analytics in Social Media Defining a Very Broad Term, Types of Analytics in Social Media: Analytics, Listening, Advertising Analytics, Analytics from CMS and CRM, Analytics or Channel Analytics, Social Media Listening: Keyword and Mention-Based Analysis, Interests and Sentiment, Advertising Analytics: Focus on Conversions and ROI of Paid Social Media Campaigns CMS Analytics: Measuring the Performance of the Content Management Team, CRM Analytics: Customer Support and Sales via Social Media

Module 4: Dedicated vs. Hybrid Tools: The Advantages and Disadvantages, Data Integration Tools – advantages and disadvantages. Differences of Social Media Networks: Interactivity: How Social Is the Network? Social Media as a Two-way Channel, The Analytics Process - Investigation Beyond Social Analytics Metrics, Dashboards, and Reports

TEXT BOOK

- Alex Goncalves, Social Media Analytics strategy using data to optimize business performance, Apress

MAJOR PROJECT & VIVA

COURSE OUTCOMES: at the end of the Course, the Student will be able to -

	Apply the knowledge gained through various courses
	Understand structured team work and project management
	Create technical documentation

PROJECT GUIDELINES

- Group Size – Maximum 3
- No. of records – No. of group members+ 1 (Department copy)
- Certificate should include the names of all members

The minimal phases for the project are: Project search, finalization and allocation, Investigation of system requirements, Data and Process Modelling, System Design, Program design, Program coding and unit testing, System integration, System implementation and acceptance testing.

Planning the Project: The Major Project is an involved Exercise which has to be planned well in advance. The topic should be chosen in Semester 5 itself. Related reading, training and discussions should start from semester 5 itself.

Selection of Tools: No restrictions shall be placed on the students in the choice of platforms/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

Selection of Organisation & Guide: No restrictions shall be placed on the students in the choice of organization where project work may be done, in terms of locality, type (public/private) etc. It is the duty of the project coordinator to ensure that the Aim, Objectives and full project guidelines are communicated to the external organization.

Students may also choose to do project in the college/institute (or partially in the college/institute and partially in an external organization), especially product-based work, but in such cases the supervisors must ensure that (i) industry practices are followed (ii) the students undertake a planned

visit to an IT industry with international operations to make up for the loss of experience and (iii) the services of an external guide with industry experience is obtained.

Project Management: Head of the department should publish a list of students, projects topics, internal guide and external organization (if any) and teams agreed, before the end of semester 5. Changes in this list may be permitted for valid reasons and shall be considered favorably by Head of the department any time before commencement of the project.

Documentation: The following are the major guidelines: The final outer dimensions of the report shall be 21 cm X 30 cm. The colour of the flap cover shall be uniform. Only hard binding should be done, with title of the thesis and the words “<BRIEF TITLE> DATA SCIENCE Project Report 200...” displayed on the spine in 20 point, Bold, Times New Roman, as in example below. In case the title is too long, a shorter version of it may be used (Like “Image Pro” instead of ”Image Pro – An Interactive Image Processing package”). It is highly recommended that Latex be used for documentation.

- The text of the report should be set in 12 pt, Times New Roman, Single Spaced.
- Headings should be set as follows: CHAPTER HEADINGS 20 pt, Times New Roman, Bold, All Caps, Centered.

WEB BASED BILLING SOFTWARE DATA SCIENCE PROJECT 2023

1. SECTION HEADINGS 12 pt, Times New Roman, Bold, All Caps, Left Adjusted.
 - 1.1 Section Sub-headings 12 pt, Times New Roman, Bold, Left Adjusted.Titles of Figures, Tables etc are done in 12 point, times New Roman, Italics, Centered.

<PROJECT TITLE>

<STUDENT’S NAME>

<COLLEGE NAME>

PROJECT REPORT

Submitted in partial fulfillment of the
Requirements for the award of
BCom Accounting and Data Science [Double Main] degree of
University of Kerala
2023

Some general guidelines on documentation stylistics are:

- Double quotes and single quotes (“”, “”) should be used only when essential. In most cases words put in quotes are better highlighted by setting them in italics. Eg: This process is known as “morphing”. This process is known as *morphing*.
- Page numbers shall be set at right hand top corner, paragraph indent shall be set as 3.
- Only single space need be left above a section or sub-section heading and no space may be left after them.
- Certificate should be in the format: “Certified that this report titled..... is a bonafide record of the project work done by Sri/Kum..... under our supervision and guidance, towards partial fulfillment of the requirements for the award of the Degree of BCom Accounting and Data Science [Double Main] of the University of Kerala” with dated signatures of Internal; Guide, external guide and also Head of Institute/College.
- If the project is done in an external organization, another certificates on the letterhead of the organization is required: “Certified that his report titled..... is a bonafide record of the project work done by Sri/Kum..... under any supervision and guidance, at theDepartment of..... (Organization) towards partial fulfilment of the requirements for the award of the Degree of BCom Accounting and Data Science [Double Main] of the University of Kerala”.

Project IPR & Utilisation: The intellectual property rights in all project work done by the students shall vest with the University of Kerala, except in cases where some external organizations seek undertaking from students to concede IPR in all work done in their organization or under their guidance. Where possible, students should attempt to obtain at least a joint IPR for the University. In cases where project works are of public utility, students shall be asked to publish their work including source code and documentation, in so far as their rights are clear.