B.A ECONOMICS (UG) COURSE STRUCTURE UNDER CBCS PATTERN

(For the Candidates admitted from (2019-2020 onwards)

Semester		Course Code	Title of the Course	Hrs/ Week	Credit	Internal	External	Total
I	Part-I	LC-I	Language Course-I Tamil	6	3	25	75	100
	Part-II	ELC -I	English Language Course-I	6	3	25	75	100
	Part-III	CC-I	History of Economic Thought	5	4	25	75	100
		CC-II	Micro Economics -I	6	4	25	75	100
		AC-I	Economic Statistics	5	4	25	75	100
	Part-IV	VE	Value Education	2	2	25	75	100
				30	20			
II	Part-I	LC-II	Language Course-II Tamil	6	3	25	75	100
	Part-II	ELC -II	English Language Course-II	6	3	25	75	100
	Part-III	CC-III	Micro Economics-1I	5	3	25	75	100
		AC-II	Statistical Methods	5	5	25	75	100
		AC-III	Statistics :Pertaining to Indian Context	4	4	25	75	100
	Part-IV	SKBC-I	Human Resource Management	2	2	25	25	100
	Part-IV	EVNS	Environmental Studies	2	2	25	75	100
				30	22			
III	Part-I	LC-III	Language Course-III Tamil	6	3	25	75	100
	Part-II	ELC -III	English Language Course-III	6	3	25	75	100
	Part-III	CC-IV	Indian Economic Development	6	5	25	75	100
		CC-V	Macro Economics-I	5	4	25	75	100
		AC-IV	Marketing	5	4	25	75	100
	Part-IV	SKBC-II	Human Resource Development	2	2	25	75	100
	Part-IV		Gender Studies	-	1	25	75	100
				30	22			
	Part-I	LC-IV	Language Course-IV Tamil	6	3	25	75	100

IV								
	Part-II	ELC -IV	English Language Course-IV	6	3	25	75	100
	Part-III	CC-VI	Macro Economics-II	5	4	25	75	100
		CC-VII	Monetary Economics	5	3	25	75	100
		AC-V	International Business Environment	3	4	25	75	100
		AC-VI	Principles of Management	3	3	25	75	100
	Part-IV	SS	Soft Skills	-	2	25	75	100
	Part-IV	NMEC-I	Economics of Infrastructure	2	2	25	75	100
				30	24			
V	Part-III	CC-VIII	Fiscal Economics	6	4	25	75	100
		CC-IX	Capital Market in India	6	5	25	75	100
		CC-X	Tamil Nadu Economy	6	4	25	75	100
		CC-XI	Tourism Management	5	5	25	75	100
	Part-III	EC-I	Principles of Accountancy	5	5	25	75	100
	Part-IV	NMEC-II	Analysis of Indian Economy	2	2	25	75	100
				30	25			
VI	Part-III	CC-XII	International Economics	5	4	25	75	100
		CC- XIII	Agricultural Economics	5	4	25	75	100
		CC-XIV	Rural Industralisation in India	5	4	25	75	100
		CC-XV	Computer Application in Economics	5	4	25	75	100
		EC-II	Entrepreneurial Development	5	5	25	75	100
		EC-III	Personnel Management	5	5	25	75	100
	Part-IV	Extension Activities		-	1	-	-	100
				30	27			
		Total		**180**	**140**			4100
	Part-IV	CC	Comprehensive Course	-	4	-	-	100
		SKBC-III			2	-	-	100
					146			4300

Programme Educational Objectives:

PEO1:Technical Proficiency:

Succeed in getting employment appropriate to their interests and education in different areas such as industry, the professions and government.

PO2: Professional Growth:

Prepare to pursue advanced degrees as the M.A., M.B.A., or Ph.D. in economics, business or related fields and will become an economist, statistician, investment analyst and stock broker through life - long learning.

PO3: Analytical Managerial and Communication Skills:

Exercise the analytical, managerial and communication skills in a responsive, ethical and innovative manner.

Programme Outcomes

PO1: Demonstrate the knowledge in the subject of Economics and apply the principles of the same to the needs of the Employer/ Institution/ Enterprise / Society.

PO2: Gain analytical skills not only in the field of Economics but also other fields.

PO3: Demonstrate Professional ethics, Community living and Nation Building Initiatives.

PO4: Evaluate the functioning of the economic system.

PO5: Design solutions for the economic issues and problems faced by individuals, organizations and society and apply the economic principles that help to explain behavior and the range of institutions that affect the allocation of resources.

PO6: Employ statistical methods in the analysis of economic data and models.

PO7: Apply the fundamental principles of modern economics to economic, social, health and safety and environmental considerations

Programme Specific Outcomes

At the end of the Undergraduate Programme, Students will be able to

PSO1: apply knowledge and principles of Economics in the domain of research and the same to the needs of Employer/ Institution/ Society.

PSO2: solve the complex problems in the field of economics with an understanding of the societal, legal and cultural impacts of the solution (Example: Goods and Service Tax (GST)- Fiscal & Monetary Policy nexus).

PSO3. determine the economic variables including inflation, unemployment and poverty using statistical methods.

PSO4: demonstrate their knowledge of the fundamentals and technical concepts of economics and apply the basic theories of economics in critical thinking and problem solving.

PSO5: analyse the performance of Indian Economy and World Economy

PSO6: analyse the behavior of financial and money markets and make decisions wisely using cost- benefit analysis.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
HISTORY OF ECONOMIC THOUGHT CORE COURSE - I	CO1: Evaluate different streams of economic thinking as well as some personalities who had an impact in history of economic thought. CO2: Interpret and synthesize the contributions made by the various economists in the history of economic thought. CO3: Explain the contributions of Nobel Laureates and Welfare economists.
MICRO ECONOMICS -I CORE COURSE –II	CO1: Distinguish Micro and Macro Economics. CO2: Explain the Law of Diminishing Marginal Utility and Law of Equi- Marginal Utility. CO3: Describe price, income and substitution effects. CO4: Differentiate the Law of Variable proportions and Returns to scale. CO5: Analyse the different types of costs.

ECONOMIC STATISTICS ALLIED COURSE –I	CO1: Discuss and explain what statistics is and how it is used in various fields. CO2: Recognize some common types of sampling design such as simple random sampling, stratified random sampling and quota sampling. CO3: Represent the statistical data with suitable diagrams and graphs. CO4:Calculate the various Measures of Central Tendency, Dispersion and Skewness.
MICRO ECONOMICS – II CORE COURSE – III	CO1: Define the concepts like perfect competition, monopoly, monopolistic competition and price discrimination. CO2: Compare the price determination under different market conditions. CO3:Explain the various theories related to rent, wages, interest and profit.
STATISTICAL METHODS ALLIED COURSE -II	CO1: Recall the key properties of the Binomial, Poisson and Normal Distributions. CO2: Compute and interpret the results of Regression and Correlation analysis. CO3: Explain the various methods of Association of attributes. CO4: Perform the Chi-square test.
STATISTICS: PERTAINING TO INDIANCONTEXT ALLIED COURSE-III	CO1: Explain the origin and growth of statistics in India. CO2: Identify the sources and uses of agricultural, industrial, vital and other basic statistics in India. CO3: Analyse the Agricultural Statistics, Industrial Statistics, Labour Statistics and Financial Statistics. CO4: List out Government and Private Statistical Sources.
HUMAN RESOURCE MANAGEMENT SKII BASED COURSE –I	CO1: Apply their knowledge to utilize the Human Resources effectively for the growth of Indian Economic Development. CO2: Distinguish the Personnel management and Human Resource Management. CO3: Identify the importance of Human resource planning. CO4: Explain the Career Planning, Executive Development and Interpersonal processes.

INDIAN ECONOMIC DEVELOPMENT CORE COURSE – IV	CO1: Distinguish Growth and Development. CO2: Identify the factors inhibiting economic development. CO3:Explain the causes and measures of poverty and unemployment. CO4: Analyse the causes for low agricultural productivity in agriculture. CO5: Describe the development of some large scale industries in India and New Economic Policy.
MACRO ECONOMICS-I CORE COURSE -V	CO1: Identify the macro economic issues in the economy. CO2: Apply their knowledge and skills to work as consultant to prepare micro model and to calculate macro economic variables such as circular flow of income in a society and National Income. CO3: Explain the types of employment and measurement of full employment level. CO4: Describe and evaluate the Classical and Keynesian theory of Employment. CO5: Explain the various theories of consumption function.
MARKETING ALLIED COURSE-IV	CO1: Explain the functions of marketing. CO2: Define the marketing information system and marketing research. CO3:Distinguish marketing management and sales management. CO4: Apply their knowledge in determining the types of brand and pricing. CO5: Describe the channels of distribution.
HUMAN RESOURCE DEVELOPMENT SKIL BASED COURSE –II	CO1: Define the concepts Human resource development, Training and Manpower planning. CO2: Identify the barriers Human Resource Development Programmes. CO3:Apply their knowledge in Manpower Planning and Human Resource Development. CO4: Explain Human Resource Dimensions of New Economic Policy. CO5: Describe Human Resource Development in India.

GENDER STUDIES (Self Study Course)	CO1: Apply their knowledge to identify each others strengths and weakness. CO2: Promote attitudinal change towards a gender balanced ambience and women empowerment. CO3: Determine the areas of Gender Discrimination. CO4: Differentiate women development and gender development. CO5: Identify the safe guarding mechanism for women in India
MACRO ECONOMICS– II CORE COURSE - VI	CO1: Identify the relationship between Marginal Efficiency of Capital and Marginal Efficiency of Investment. CO2: Explain Supply of Money, the Multiplier and Accelerator interaction and the velocity of circulation of money. CO3:Describe Demand for Money and the General Equilibrium Analysis. CO4: Evaluate Modern Theory of Wages and Employment.
MONETARY ECONOMICS CORE COURSE - VII	CO1**: D**efine the concepts of money, inflation, deflation and trade cycle. CO2: List out the causes and effects of inflation and deflation. CO3: Describe the theories of trade cycle. CO4: Identify the Instruments of Monetary and Fiscal Policies. CO5:Explain the various functions of Commercial banks and Reserve Bank of India
INTERNATIONAL BUSINESS ENVIRONMENT ALLIED COURSE –V	CO1: Distinguish the Domestic business and International business. CO2:Explain the socio cultural environment and Technological, Economical, Political, Cross cultural solutions for International business. CO3: Describe the multinational corporations. CO4: Identify the Foreign Trade Procedures. CO5: Analyse the future of international business.
PRINCIPLES OF MANAGEMENT ALLIED COURSE –VI	CO1: explain the nature and scope of management process. CO2:describe the methods of Planning. CO3:analyse the consequences of poor organization. CO4: identify the principles of Delegation and Coordination. CO5: solve the problems in decision making.

ECONOMICS OF INFRASTRUCTURE NON MAJOR ELECTIVE -I	CO1: analyse the main categories of Infrastructure including physical, economic and social with special reference to the Indian situation. CO2: explain the importance, modes of transport and communication system in India. CO3: describe the role of energy resources and banks in Indian economic development. CO4: identify the issues in health services and higher education. CO5: evaluate the special initiatives and programmes in rural and urban infrastructure.
FISCAL ECONOMICS CORE COURSE-VIII	CO1 : explain the scope of public finance and public expenditure. CO2 : analyse the effects, shifting and incidence of Taxation. CO3 : discuss the impact of GST on Indian Economy. CO4 : identify and analyse the causes, effects and burden of public dept.
CAPITAL MARKET IN INDIA CORE COURSE – IX	CO1: differentiate the money market and capital market. CO2: identify the sources of finance and types of shares and debentures. CO3: explain the Different Schemes of Mutual Fund and Unit Trust of India. CO4: apply their knowledge in e- banking services .
TAMILNADU ECONOMY CORE COURSE – X	CO1: recall the basic features of Tamil Nadu Economy. CO2: analyse the industrial development in Tamil Nadu. CO3: identify the State aid to Industrial Development. CO4: explain the Infrastructural Development in Tamil Nadu. CO5: list out the sources of revenue of the State.
TOURISM MANAGEMENT CORE COURSE - XI	CO1: describe the scope of tourism and classification of tourism. CO2: identify the Tourism Accommodation. CO3: recall the role of a tourist guide. CO4: analyse Tourism organizations in India. CO5: apply their knowledge in tourism marketing.
PRINCIPLES OF ACCOUNTANCY ELECTIVE	CO1: explain the branches of accounting. CO2: distinguish the journal and ledger. CO3: identify the kinds of subsidiary books.

COURSE-I	CO4: compute final accounts CO5:describe the methods of depreciation accounting.
ANALYSIS OF INDIAN ECONOMY NON MAJOR ELECTIVE COURSE –II	CO1: identify the basic characteristics of Indian economy. CO2: demonstrate the technological change in Agriculture. CO3: explain the causes of industrial sickness. CO4: analyse the trends in foreign trade in India. CO5: describe the New economic reforms in India.
INTERNATIONAL ECONOMICS CORE COURSE - XII	CO1: distinguish the Internal and International Trade. CO2: list out the types of tariff. CO3: identify the causes for disequilibrium in Balance of Payments. CO4: explain Purchasing Power Parity Theory. CO5: describe functions of International institutions
AGRICULTURAL ECONOMICS CORE COURSE – XIII	CO1: recall the factors affecting cropping pattern in India. CO2: analyse causes of rural indebtedness and the conditions of Agricultural Labourers in India. CO3: identify the sources of agricultural finance. CO4: discuss the causes for Food problem. CO5: evaluate the agricultural policy in India.
RURAL INDUSTRIALISTION IN INDIA CORE COURSE – XIV	CO1: list out features of rural economy in India. CO2: identify the types of rural industries. CO3: recall the various sources of finance to rural industries. CO4: list out the problems of rural industries. CO5: evaluate the Government measures for the promotion of Rural Industries.
COMPUTER APPLICATION IN ECONOMICS CORE COURSE – XV	CO1: explain the basic concepts like computer, hardware, software and internet. CO2: create a word document CO3: recall the procedure to apply the statistical tools with Statistical Packages for Social Science (SPSS) to anlayse the results in various fields. CO4: create power point presentation. CO5: apply their knowledge to use Statistical Packages for Social Science(SPSS) for statistical analysis.
ENTREPRENEURIAL DEVELOPMENT ELECTIVE	CO1: list out the factors affecting entrepreneurial growth. CO2: explain the institutions conducting Entrepreneurship Development Programmes.

COURSE – II	CO3: identify the project and apply the techniques of financial analysis. CO4: describe the functions and growth of women entrepreneur. CO5: recognize the entrepreneurial skills to start a business.
PERSONNEL MANAGEMENT ELECTIVE COURSE -III	CO1: define the concepts of personnel management, recruitment, promotion, transfers, Job evaluation and labour turnover. CO2: identify the sources of recruitment. CO3: list out the methods of job evaluation and training. CO4: compare the advantages of various incentive plans. CO5: identify measures of industrial health and safety.

DEPARTMENT - ENGLISH
COURSE STRUCTURE (CBCS)

NEHRU MEMORIAL COLLEGE (AUTONOMOUS) UG Programme (English) – Curriculum Framework For the candidates admitted from 2019 – 2020 onwards

Sem.	Code	Title	Hrs/Wk	Credits	Marks		
					Int.	Ext.	Ext.
I	LC	Language Course (Tamil) I	6	3	25	75	100
	ELC	English Language Course I	6	3	25	75	100
	CC	Core Course I	6	4	25	75	100
	CC	Core Course II	5	4	25	75	100
	AC	Allied Course I	5	4	25	75	100
	VE	Value Education	2	2	25	75	100
	Total	**6**	**30**	**20**	**150**	**450**	**600**
II	LC	Language Course(Tamil) II	6	3	25	75	100
	ELC	English Language Course II	6	3	25	75	100
	CC	Core Course III	5	4	25	75	100
	AC	Allied Course II*	5	4	25	75	100
	AC	Allied Course III	4	4	25	75	100
	EVS	Environmental Studies	2	2	25	75	100
	SKBC	Skill Based Course I	2	2	25	75	100
	Total	**7**	**30**	**22**	**175**	**525**	**700**
III	LC	Language Course(Tamil) III	6	3	25	75	100
	ELC	English Language Course III	6	3	25	75	100
	CC	Core Course IV	6	5	25	75	100
	AC	Core Course V	5	4	25	75	100
	AC	Allied Course IV	5	4	25	75	100
	SKBC	Skill Based Course II	2	2	25	75	100
	GS	Gender Studies	-	1	25	75	100
	Total	**7**	**30**	**22**	**175**	**525**	**700**

Sem.	Code	Title	Hrs/Wk	Credits	Marks		
					Int.	Ext.	Tot.
	LC	Language Course (Tamil) IV	6	3	25	75	100
	ELC	English Language Course IV	6	3	25	75	100
	CC	Core Course VI	6	5	25	75	100
IV	CC	Allied Course V	5	4	25	75	100
	AC	Allied Course VI	5	4	25	75	100
	NMEC	Non Major Elective Course I	2	2	25	75	100
	SSC	Soft Skill Course	-	2	25	75	100
	Total	**7**	**30**	**23**	**175**	**525**	**700**
V	CC	Core Course VII	6	5	25	75	100
	CC	Core Course VIII	6	5	25	75	100
	CC	Core Course IX	6	5	25	75	100
	CC	Core Course X	5	5	25	75	100
	EC	Elective Course I	5	5	25	75	100
	NMEC	Non Major Elective Course II	2	2	25	75	100
	Total	**6**	**30**	**27**	**150**	**450**	**600**
VI	CC	Core Course XI	6	5	25	75	100
	CC	Core Course XII	6	5	25	75	100
	CC	Core Course XIII	6	5	25	75	100
	EC	Elective Course II	6	5	25	75	100
	EC	Elective Course III	6	5	25	75	100
	EA	Extension Activities	-	1	-	-	-
	Total	**6**	**30**	**26**	**125**	**375**	**500**
	TOTAL	**41**	**180**	**140**	**950**	**2850**	**3800**
		Comprehensive		4			100
		SKBC III (Self Study)		2	25	75	100

Programme Educational Objectives (PEO)

PEO – 1 To qualify the students to be competent individuals to Enlighten and educate the society.

PEO – 2 To provide in-depth knowledge of literature.

PEO – 3 To make them understand the responsibilities that they might remain the base of the society.

PEO – 4 To inculcate the students to be morally and spiritually sound.

Programme Outcome (PO)

PO – 1 Enhancing the students with personal, intellectual and professional skills through language and literature.

PO – 2 Making students to understand their responsibilities and social values.

PO – 3 Realize of their own identity, making them to realize.

PO – 4 Infusing in them the need for betterment.

Programme Specific Outcome (PSO)

PSO – 1 Design solutions to overcome communication problems of the student as a second language speaker.

PSO – 2 Apply ethical principles and commit to professional ethics and responsibilities and norms of literature practice.

PSO – 3 Recognizing the need for extensive reading skills become a life-long reader.

PSO – 4 To function as a team and as an individual member in an effective way amicably with other co-workers and to reach finally as a responsible leader.

PSO –5 To achieve individual and collective freedom and to reject any kind of discrimination in the society.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CORE COURSE – I – PROSE	CO 1: To realize the importance of religious unity. CO 2: To know the history of journals. CO 3: To be cautious of critical situations. CO 4: To inculcate the value of tolerance. CO 5: To realize the importance of spoken English
CORE COURSE – II - FICTION	CO 1: To retain the joy of giving gifts CO 2: To inculcate the values of life CO 3: To Know the time of Victorian life CO 4: Imparting them valiant life in storm CO 5: To be aware of social injustice during the industrial revolution
ALLIED COURSE-I SOCIAL HISTORY OF ENGLAND	CO1: Renew the spirit of learning CO2: Strive to acquire a good life style CO3: Make the learners study the great works CO4: Grant them the aspect of French revolution CO5: Educate them the political parties in England
CORE COURSE – III - POETRY I	CO 1: To be strong during storm of life CO 2: Refinement of character through affliction CO 3: Accountability of resources CO 4: Treatment of all the people with due honour CO 5: Possessing the spirit of equality at adversity
ALLIED COURSE-II HISTORY OF ENGLISH LITERATURE-I (From Pre-Chaucerian Period to the Age of Pope)	CO1: Enhance them work with the available sources CO2:Encourage them to be better with the spirit of enthusiasm CO3:Create an impact through the greatness of Shakespeare CO4:Encourage them to write poetry on their own CO5: Strive to work towards standard ideas
ALIED COURSE-III LITERARY FORMS AND TERMS	CO1: Developing their creativity CO2: Make them use figures of speech in their daily lives CO3: Instill in them the desire to write a biography CO4: To be dramatist if time permits CO5: Motivate them to be a short story writer
SKBC-I REMEDIAL ENGLISH	CO1: encourage them to be writer at a small level CO2: make them use the language correctly CO3: encourage them to be competent in the language CO4: make them write letters properly CO5: to be better doing the daily cores of life

CORE COURSE-IV POETRY II	CO1: Life is followed by adverse times CO2: To be artistic in life CO3: To understand the forthcoming new life after darkness CO4: To realize the betterment of life after hardship CO5: To be patriotic as a citizens of the country
CORE COURSE – V - DRAMA –I	CO 1: Students will know the end of vice and virtue of life CO 2:Students will understand the result of revenge CO 3: Students will be exposed to the life of the middle class CO 4: Students will learn the life of the rich women CO5: Students will understand the power of true love
ALLIED COURSE-IV HISTORY OF ENGLISH LITERATURE-II (From The Age of Johnson to the Postmodern Literature)	CO1: To motivate them to be efficient in learning CO2: Make them acquire the knowledge of Romanticism CO3: Enrich them to be adventurous despite issues in life CO4: Make them accept life as it comes CO5: Teach them to change with the ages
SKBC – II- PHOTO JOURNALISM	CO1: Students gain knowledge and skills of Photography CO2: Can become better photographers and camera technicians CO3: They can become photojournalists and seek opportunity in mass media CO4: Make them become photographers CO5: To be better in the art of photography
CORE COURSE – VI - DRAMA-II	CO 1: Students will understand the feudal life of England CO 2: Students will know the meaningless life of the rich CO 3: Students will know illusions in human life CO 4: Students will understand the life of the rich CO 5: Students will know the rituals of the rich
ALIED COURSE-I HISTORY OF ENGLISH LANGUAGE	CO1: Make the students learn English with pride CO2: Enhance them to be knowledgeable of the evolution of the language CO3: Enrich them to be competent speaker CO4: Make them be familiar with knowledge of English CO5: Enrich them to be proficient with diction
ALIED COURSE VI - PRINCIPLES OF LITERARY CRITICISM	CO1: Understand the misconception of poetry CO2: Understand the lyrical qualities in a ballad CO3: Understand the true reason for studying poetry CO4: Understand the relation between tradition and writing skills CO5: Understand the relation between imagination and a work of art

NMEC COURSE-I ENGLISH FOR BUSINESS COMMUNICATION	CO1: Become familiar with the basics of English CO2: Be a better communicator CO3: Be a competent communicator with clarity CO4: Be a persuasive communicator selling his own goods CO5: Make them proficient in their career
SKBC- SOFT SKILS	CO1: Become a better receiver CO2: Become a better reader CO3: Become a better writer CO4: Become a better speaker CO5: To write a good business letter
CORE COURSE VII-SHAKESPEARE	CO1: Gain an insight into the age of Shakespeare CO2: Realize the themes and techniques of Shakespearean plays CO3: Learn how love works. CO4: Understand the true nature of marriage CO5: Expose to the specific time of history of England
CORE COURSE VIII - INDIAN WRITINGIN ENGLISH	CO1: Know the major aspects Indian life CO2: Know cultural aspects of India. CO3: Understand humor in Indian works CO4: Learn the riots that followed Indian independence CO5: Understand how justice functions in India
CORE COURSE-IX - PHONETICS	CO1: Know the function of speech organs CO2: Learn consonant sounds. CO3: Learn vowel sounds CO4: Understand the syllable structure CO5: Understand stress and intonation
CORE COURSE-X - FEMINIST WRITING IN ENGLISH	CO 1: To understand the role of women in the society CO 2: Know the different levels of inequalities faced by women CO 3: Students will be introduced feminist view to race CO 4: Will understand feminist feelings CO5: Will understand the sufferings undergone by women
ELECTIVE COURSE I-TRANSLATION THEORY AND PRACTICE	CO 1: Students will acquire the basic principles of translation CO 2: Students will understand the relation between translation and life. CO 3: Students will know the process of translation of poetry, drama and prose.. CO 4: Students will be trained from one language to another language CO 5: Students will be exposed to the translated Indian classics.

NMEC – II CHILDREN'S LITERATURE	CO1: Students can experience the pleasure by reading a story CO2: Students will develop a love for children's literature CO3: Students will identify ethics in children's literature. CO4: Students will know the fantasy world of children CO5: Students will acquire modern children literature
CORE COURSE XI- NEW LITERATURES IN ENGLISH	CO1: The learners will understand the nature of colonialism CO2: Students will be familiar with the colonial Post colonial literature CO3: Students will understand the sufferings of the natives. CO4: Students will understand the racial problems CO5: Students will know how minds broke down during colonial days.
CORE COURSE-XII AMERICAN LITERATURE	CO1: Students will understand the difficulties in making choices in life. CO:2 Students will understand the purpose of living. CO3: Students will understand the wealth of America. CO4: Students will understand the light and fantasy of American Literature. CO5: Students will be exposed to fight till the end
CORE COURSE XIII- ENGLISH LANGUAGE TEACHING	CO 1: Students will learn the major problems of English Language Teaching. CO 2: They will acquire the skill of teaching English. CO 3: They will understand the essentials of teaching drama and prose. CO 4: They will know the tools of evaluations. CO 5: They will learn to operate audio, visual equipments
EC – II - COMPARATIVE LITERATURE	CO1: Students will obtain clear concepts of the theories. CO2: Students will be aware of the characteristics of French and American schools. CO3: Students will comprehend the concepts of imitation and influence CO4: Students will know genre studies CO5: Students will understand the relation between literature and other arts
EC – III - - JOURNALISM	Co1: Students will understand ethics of journalism Co2: Students will know different kinds of news Co3: Students will become good reporters Co4: Students will know the techniques of editing Co5: Students will become news story writers.

COMPREHENSIVE PAPER	Co 1: Prose , fiction, poetry Co 2: Poetry ii, drama i drama ii Co 3: Shakespeare, Indian writing English, phonetics Co 4: Feminist writing, new literature Co 5: American literature, English language teaching
SKBC-III PERSONALITY DEVELOPMET (Self Study)	Co 1: Methods to develop personalities Co 2: Will become more confident Co 3: Will become in skilled in verbal and non verbal communication Co 4: Will become more self reliant Co 5: Will be skilled in problem solving

M.A. ENGLISH LITERATURE

COURSE PATTERN (FROM 2019-2020)

Sem.	Course	Course Title	Hrs / Week	Credit	MAX.MARKS		
					Int.	Ext.	Total
I	Core Course I	British Literature I (From Chaucer to the Elizabethan Age 1340-1660)	6	5	25	75	100
	Core Course II	British Literature II (Neo- Classical Age 1660-1798)	6	5	25	75	100
	Core Course III	Indian Writing In English	6	4	25	75	100
	Core Course IV	American Literature	6	4	25	75	100
	Core Course V	Advanced Skills for Spoken Communication	6	4	25	75	100
TOTAL			**30**	**21**	**125**	**375**	**500**
II	Core Course VI	British Literature III (From Wordsworth to Tennyson 1798-1887)	6	5	25	75	100
	Core Course VII	British Literature IV(from 1887 onwards)	6	5	25	75	100
	Core Course VIII	Shakespeare	6	5	25	75	100
	Core Course IX	Non Fictional Prose	6	4	25	75	100
	Core Course X	Applied Linguistics	6	4	25	75	100
TOTAL			**30**	**23**	**125**	**375**	**500**
III	Core Course XI	Literary Criticism I	6	5	25	75	100
	Core Course XII	Research Methodology	6	5	25	75	100
	Core based Elective I	Canadian Literature	6	4	25	75	100
	Core Based Elective II	Post Colonial Literature	6	4	25	75	100
	Open Elective I	Soft Skills For Advanced Learners	6	4	25	75	100
TOTAL			**30**	**23**	**125**	**375**	**500**
IV	Core Course XIII	Literary Criticism II	6	5	25	75	100
	Core Course XIV	Diaspora Literature	6	5	25	75	100
	CCXV	PROJECT WORK	6	5	25	75	100
	Core Based Elective III	Feminist Writing in English	6	4	25	75	100
	Core Based Elective IV	Film Reviews and Presentations	6	4	25	75	100
TOTAL			**30**	**23**	**125**	**375**	**500**
GRAND TOTAL			**120**	**90**	**500**	**1500**	**2000**

Programme Educational objectives (PEO)

Programme Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation. The PEO is measured through employer satisfaction survey(yearly), alumni survey and placement records.

PEO 1: Learners will be ready to serve the human society to fulfill the essential needs.
PEO 2: They will be able to execute their talents in professional organizations.
PEO 3: The Graduates will attain problem solving skills.
PEO 4: Learners will formulate new innovative ideas for the betterment of the society.

Program Outcome (PO)

The POs are narrower statements that describe what the students are expected to know and be able to do by the time of graduation. POs are based on relevance.

PO 1 : Become knowledgeable in the subject of English Literature and apply the principles of the same to the needs of the Employer/Institution/Enterprise/ Society.

PO 2: Gain Analytical skills in the field/area of English Literature

PO 3: Understand and appreciate professional ethics, community living and Nation Building initiatives.

PO 4: Proficiency over a language in analyzing literacy, criticism and in research.

PO 5: Getting ability to formulate hypothesis and to defend.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSOs are Statement that describe what the graduates of a specific educational

Programme should be able to do.

PSO1: Ability to use a glossary of literary terms in the historical context.

PSO 2: Getting knowledge related to genre, style, forms and narratives, technologies and theories.

PSO 3:Learners will be able to conduct and wake up research on a given topic within literary sub fields.

PSO 4: Enriching public speaking skills.

PSO 5: Searching identity, crossing racial barriers, denying gender prejudice in the national and the international literary traditions.

PSO 6: Be able to participate in conferences and workshops and to publish articles in reputed journals.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
BRITISH LITERATURE – I	CO 1: know the beginning of English Literature . CO 2: know the culture of England during the 17th century. CO 3: become familiar with Shakespearean Sonnets. CO 4: read a literary text with historical backgorund. CO5: understand the life of the rich of England in the past
BRITISH LITERATURE – II	CO 1: change their outlook to men and matters. CO 2: enjoy a piece of satire. CO 3: develop a mind setting for adventure. CO4: understand feudal life in England CO 5: avoid vanity in life.
INDIAN WRITING IN ENGLISH	CO 1: remember the past CO 2: understand life in the villages of India. CO 3: work hard for the nation. CO 4: understand the unknown parts in the history of India. CO5: know the relation between literature and economics
AMERICAN LITERATURE	CO 1: know the dark side of human life CO 2: know the parables of the past CO 3: understand the relation between literature and society CO 4: realize the need for ethics in a luxurious life CO5: understand the history of America before Lincoln
ADVANCED SKILLS FOR SPOKEN COMMUNICATION	CO 1: know the types of communication CO 2: communicate shortly and effectively. CO 3: address a gathering more confidently. CO 4: develop their personality CO 5: face interviews successfully

BRITISH LITERATURE – III	CO 1: understand the relation between nature and poets CO 2: understand the value of companionship. CO 3: know the early Greek literature. CO 4: know about early English female writers. CO5 : understand adolescent life
BRITISH LITERATURE – IV	CO 1: understand the need for religion for a healthy life CO 2: realize dangers in modern life CO 3: understand why people sacrifice everything for religion. CO 4: understand the basics of human psychology. CO5: know the English adventurous spirit
SHAKESPEARE	CO 1: study the early romantic works of Shakespeare CO 2: know English chronicles CO 3: understand Shakespeare's views to vaulting ambition. CO 4: understand disguise in literature. CO5: understand the rustic life of Europe
NON FICTIONAL PROSE	CO 1: appreciate ancient wisdom CO 2:study biography completely and objectively CO 3: understand the bond between ancient and the modern knowledge CO 4: introduce to modern prose CO 5: read a prose piece comprehensively
APPLIED LINGUISTICS	CO 1: know different language theories CO 2: know the basics of linguistics. CO 3: understand the different theories of linguistics. CO 4: study different structures more efficiently. CO5: understand the behavior of the language learners

LITERARY CRITICISM – I	CO 1: know the basics logical and critical thinking CO 2: understand how the great epics are connected with each other CO 3: approach a text for analysis CO 4: Evaluate the significance of literature to individual and social life. CO5: the mutual influence of the writer and his text
RESEARCH METHODOLOGY	CO 1: know the kinds of discourse CO 2: Cultivate the knowledge of the fundamentals of research CO 3: know how to collect and arrange data. CO 4: Formulate hypothesis. CO 5:wirte a good thesis
CANADIAN LITERATURE	CO 1: know eminent Canadian writers CO 2: enjoy and appreciate unique features of nature in Canadian literature CO 3: understand native Canadian themes CO 4: Know Canadian ethnic minority studies. CO 5: understand the uniformity in structure in literature
POST COLONIAL LITERATURE	CO 1: Acquire a historical perspective of the post-colonial nations. CO 2: Collect consciousness over imperial effects in the present. CO 3: get a wider knowledge of the problems of the blacks CO 4: Learn the qualities of liberal citizens. CO 5: know about the complex problems of the liberated countries
SOFT SKILLS	CO 1: know the basics of soft skills. CO2 : function as team CO 3: Make appropriate and responsible decisions to become employed. CO 4: Improve Communication skills. CO 5: Get training to acquire personality development.

LITERARY CRITICISM II	CO 1: Receive extensive knowledge of literary theories. CO 2: know about great critics. CO 3: Have specialized insight into the field of current literary approaches. CO 4: Evaluate genres of writing without any bias. CO 5: know the difference between the western and eastern schools of criticism
DIASPORIC LITERATURE	CO 1: know what diasporic literature is CO 2: understand native Indian diasporic works CO 3: study the standard structure of a diasporic work CO 4: Discuss on major themes such as searching for identity, nostalgia that are universal CO 5: understand the unique problems of the settlers
PROJECT	Co 1 : Students can choose any relevant current topic of their interest Co 2 : The Project should contain minimum 25 pages Co 3 : Duration of the research will be of 6 months. Co 4 : MLA Handbook of the latest edition should be followed for guidelines. Co 5 : Plagiarism will not be encouraged.
FEMINIST WRITING IN ENGLISH	CO 1: Identify common literary trends in feminism. CO 2: Read Current social inequalities as seen by female writers. CO 3: study the liberal views of feminist writings CO 4: Recognize the uncommon themes in feminist literature. CO 5: the novel approaches of the feminist writers to common life
FILM REVIEWS AND PRESENTATIONS	CO 1: Develop a broad approach to film appreciation CO 2: Enrich knowledge of different genres of film CO 3: To approach life in its whole CO 4: know the survival techniques CO 5: write good reviews

DEPARTMENT - TAMIL

B.A., TAMIL LITERATURE - COURSE STRUCTURE under CBCS

(for candidates admitted from 2019 – 2020 onwards)

Sem	Part	Course	Title Of The Course(S)	Ins. Hrs Per Week	Cr	Exam Hrs	Int	Ext	Total
I	I	LC – I	பகுதி - 1 தமிழ்	6	3	3	25	75	100
	II	ELC – I	பகுதி - 2 ஆங்கிலம்	6	3	3	25	75	100
	III	CC – I	இக்கால இலக்கியம்	5	4	3	25	75	100
		CC – II	நன்னூல் - எழுத்ததிகாரம்	6	4	3	25	75	100
		AC – I	தமிழக வரலாறும் பண்பாடும்	5	4	3	25	75	100
	IV	VE	மதிப்புக் கல்வி	2	2	3	--	100	100
II	I	LC – II	பகுதி - 1 தமிழ்	6	3	3	25	75	100
	II	ELC – II	பகுதி - 2 ஆங்கிலம்	6	3	3	25	75	100
	III	CC – III	நன்னூல் - சொல்லதிகாரம்	5	4	3	25	75	100
		AC – II	ஆட்சித் தமிழ்	5	4	3	25	75	100
		AC – III	நாடகவியல்	4	4	3	25	75	100
	IV	EVS	Environmental Studies	2	2	3	--	100	100
		SKBC – I	படைப்பிலக்கியம்	2	2	3	--	100	100
III	I	LC – III	பகுதி - 1 தமிழ்	6	3	3	25	75	100
	II	ELC – III	பகுதி - 2 ஆங்கிலம்	6	3	3	25	75	100
	III	CC – IV	சிற்றிலக்கியம்	6	5	3	25	75	100
		CC – V	புறப்பொருள் வெண்பாமாலை	5	4	3	25	75	100
		AC – IV	கல்வெட்டியல்	5	4	3	25	75	100
	IV	SKBC- II	திரைப்படக் கலை	2	2		--	100	100
			Gender Studies	0	1		--	100	100
TOTAL				**30**	**22**				**700**

Sem	Part	Course	Title Of The Course(S)	Ins. Hrs Per Week	Cr	Exam Hrs	Int	Ext	Total
IV	I	LC - IV	பகுதி - 1 தமிழ்	6	3	3	25	75	100
	II	ELC- IV	பகுதி - 2 ஆங்கிலம்	6	3	3	25	75	100
	III	CC -VI	சமய இலக்கியம்	6	5	3	25	75	100
		AC – V	இதழியல்	5	4	3	25	75	100
		AC – VI	நாட்டுப்புறவியல்	5	4	3	25	75	100
	IV	SSC	ஆளுமைத் திறன்	0	2	3	--	100	100
		NMEC I	மேடைத்தமிழ்	2	2	3	--	100	100
V	III	CC – VII	அற இலக்கியம்	6	5	3	25	75	100
		CC- VIII	ஒப்பிலக்கியம்	6	5	3	25	75	100
		CC – IX	நம்பியகப்பொருள்	6	5	3	25	75	100
		CC – X	யாப்பருங்கலக்காரிகை	5	5	3	25	75	100
		EC – I –	*மூலிகை மருத்துவம் பணித்தேர்வுத் தமிழ்	5	5	3	25	75	100
	IV	NMEC II	ஊடகவியல்	2	2	3	--	100	100
VI	I	CC – XI	காப்பியங்கள்	6	5	3	25	75	100
	II	CC – XII	தண்டியலங்காரம்	6	5	3	25	75	100
	III	CC – XIII	சங்க இலக்கியம்	6	5	3	25	75	100
		EC – II	திருக்குறள்	6	4	3	25	75	100
		EC – III	*சுற்றுலாவியல் கணினித் தமிழ் இணையப் பயன்பாடும்	6	5	3	25	75	100
	IV	CH	Comprehensive Course	0	4			100	100
		EA	Extension Activities	0	1				
		SKBC - III	Self Study	0	2				100
									4000

Course Outcomes(Cos)

முதற்பருவம்

CC I இக்கால இலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- மரபுக் கவிதை , புதுக்கவிதை எழுதவைத்து படைப்பாக்க திறனைப் பெறுவர்.
- நாவல், சிறுகதை, உரைநடை எழுதும் திறனைப் பெறுவர்.
- புதிய இலக்கிய உத்திகளை மாணவர்கள் தெரிந்துகொளவர்.

CC II நன்னூல் - எழுத்ததிகாரம்

கற்றல் விளைவுகள் (Course Outcomes)

- இலக்கண விதிப்படி சொற்களை கற்கும் திறன் பெறுதல்.
- புணர்ச்சி இலக்கணத்தை அறிந்து பிழையின்றி எழுதுவர்.
- கல்வி உளவியலின் பயனை அறிவர்.
- எழுத்தின் பிறப்பு இனங்களை தெரிந்து கொள்வர்.

AC I தமிழக வரலாறும் பண்பாடும்

கற்றல் விளைவுகள் (Course Outcomes)

- சங்ககாலத் தமிழக வரலாற்றை தெரிந்து கொள்ளுதல்.
- சோழர், பல்லவர் ஆட்சிமுறையை அறிதல்.
- அரசியல் நிலை மன்னர்களின் ஆட்சி முறையை அறிதல்.
- சமயம், கலை நாகரிகம் பண்பாட்டை அறிதல்.

இரண்டாம்பருவம்

CC III நன்னூல் - சொல்லதிகாரம்

கற்றல் விளைவுகள் கற்றல் விளைவுகள் (Course Outcomes)

- சொற்களைத் தெளிவாகப் உச்சரிப்பர்.
- மரபு பிழை, எழுத்துப் பிழை, வாக்கியப் பிழை இல்லாது சொற்றொடரை எழுதுவர்.
- இடைச் சொற்களின் பயன்பாட்டுத் தன்மையை தெரிய வைத்தல்.

AC II ஆட்சித்தமிழ்

கற்றல் விளைவுகள் (Course Outcomes)

- ஆட்சித் தமிழ் குறித்து விழிப்புணர்வு பெறுவர்.
- ஆட்சித்தமிழ் பயன்பாட்டினை அறிவர்.
- ஆட்சித் தமிழ்ச் சொல்லாக்க முறைகளைக் கற்றுக்கொள்வர்.
- அட்சித்தமிழ் சார்ந்த அரசுத் திட்டங்களை அறிந்துகொள்வர்.

AC III நாடகவியல்

கற்றல் விளைவுகள் (Course Out Come)

- நாடக வரலாற்றை மாணவர்கள் முழுமையாக அறிதல்.
- நாடகம் எழுதவும், நடிக்கவும் பயிற்சி பெறுதல்.
- நாடகச் சான்றோர்களைப் பற்றிய அறிவு பெறுதல்.
- மெய்ப்பாட்டுக் கூறுகளை உணர்தல்.

SKBC I படைப்பிலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- படைப்பிலக்கியத் திறன் பெறுவர்.
- படைப்பிலக்கிய ஆற்றல்வழி தன்னம்பிக்கையும், சமூக அக்கறையும் கொள்வர்.
- படைப்பிலக்கிய உத்திகளைக் கற்று, சிறந்த படைப்புகளை ஆக்கம் செய்வர்.

மூன்றாம் பருவம்

CC IV சிற்றிலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- படைப்பிலக்கிய வகைமை உத்திகளை அறிந்துகொள்வர்.
- இயற்கை வளத்தினை அக்கால மக்கள் போற்றிய திறத்தினை அறிந்துகொள்வர்.
- சிறந்த சிற்றிலக்கியங்கள் குறித்துத் தெளிவு பெறுவர்.

CC V புறப்பொருள் வெண்பாமாலை

கற்றல் விளைவுகள் (Course Outcomes)

- புறம் பற்றிய செய்திகளை வெண்பா வழி அறிதல்.
- போர் அறச் செயல்களை எவ்வாறு கடைப்பிடிக்கப்பட்டன என்பதைத் தெளிதல்.
- தமிழ் மற்றும் தமிழரின் பண்பாட்டை மாணவர்களுக்கு அறிதல்.

AC IV கல்வெட்டியல்

கற்றல் விளைவுகள் (Course Outcomes)

- கல்வெட்டுகள் குறித்து அறிமுகம் பெறுவர்.
- தமிழக வரலாற்றுச் சிறப்புகளை அறிந்து கொள்வர்.
- தமிழர்களின் பழைய எழுத்துமுறைகளை அறிவர்.

SKBC II திரைப்படக் கலை

கற்றல் விளைவுகள் (Course Outcomes)

- திரைப்படத்துறையில் பணியாற்றும் வாய்ப்புகளைப் பெறுவர்.
- திரைப்படத்தின் பல்வேறு கூறுகளை அறிந்து தனக்கு ஏற்ற துறையில் பணியாற்ற விழைவர்.
- குறும்பட, ஆவணப்படக் கலைகளில் வல்லமை பெறுவர்.

நான்காம் பருவம்

CC VI சமய இலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- ஆன்மீக அருளாளர்களின் பக்தித் திறனை அறிவர்.
- அற உணர்வே ஆன்மீகத்தின் அடிப்படையாக இருக்கவேண்டும் என்பதை அறிவர்.
- பிறருக்கு உதவுதலும் அன்பு காட்டுதலும் சமயத்தின் அடிப்படை என்பதை உணர்வர்.
- சமய நல்லிணக்க உணர்வு பெறுவர்.

AC V இதழியல்

கற்றல் விளைவுகள் (Course Outcomes)

- நாளிதழ்கள் செய்கின்ற பணியினை தெரிந்துக் கொள்ளுதல்.
- மக்கள் தகவல் தொடர்பியல் சமூக ஊடகங்கள் செய்யும் பணிகளை தெரிந்துக் கொள்ளுதல்.
- படைப்பிலக்கியத்தை எழுதி இதழ்களுக்கு அனுப்பி வைத்தல்.

AC VI நாட்டுப்புறவியல்

கற்றல் விளைவுகள் (Course Outcomes)

- நாட்டுப்புறப் பண்பாட்டுக் கூறுகளை உணர்வர்.
- நாட்டுப்புறவியல் துறையின் வளர்ச்சி நிலையை தெரிந்துகொள்வர். பண்பாடு, வழக்காறுகள், பழக்க வழக்கங்கள் இவற்றை அறிவர்.
- நாட்டுப்புறக் கலைகளை நிகழ்த்தும் திறன்களை பெறுவர்.

SSC ஆளுமைத் திறன்

கற்றல் விளைவுகள் (Course Outcomes)

- ஆளுமை பண்புகளை வளர்த்துக்கொள்வர்.
- பணிஇடங்களில் சிறப்பாகப் பணியாற்றுவர்.
- நிர்வாகத் திறன் பெற்றவர்களாகத் திகழ்வர்.
- மனித உறவுகளைப் பேணுவர்.

NMEC I மேடைத்தமிழ்

கற்றல் விளைவுகள் (Course Outcomes)

- மாணவர்களை எதிர்காலத்தில் சிறந்த பேச்சாளராகத் தகுதியைப் பெறுவர்.
- மேடைப் பேச்சுகக் கலையின் நுணுக்கங்களை அறிவர்.

ஐந்தாம் பருவம்

CC VII அற இலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- அறக்கோட்பாட்டுடன் வாழ்வதன் சிறப்பினை உணர்வர்.
- வாழ்வியல் முறைகளை அறிந்து சிறப்பர்.

CC VIII ஒப்பிலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- ஒப்பிலக்கிய வரலாற்றை அறிவர்.

- ஒப்பிலக்கியக் கோட்பாடுகள் அறிந்து ஒப்பிலக்கிய ஆய்வுகளில் ஈடுபடுவர். செய்தல்.
- இலக்கியங்களின் வழி பண்பாட்டு வேறுபாடுகளை உணர்வர்.

CC IX நம்பியகப்பொருள்

கற்றல் விளைவுகள் (Course Outcomes)

- தமிழ் அகப்பொருள் இலக்கண மரபுகளை அறிந்துகொள்வர்.
- அகத்திணைக் கூறுகள் குறித்துத் தெளிவு பெறுவர்.
- தம் இல்லற வாழ்வை சிறப்புடன் அமைத்துக் கொள்வர்.

CCX யாப்பருங்கலக்காரிகை

கற்றல் விளைவுகள் (Course Outcomes)

- யாப்பிலக்கண அறிவை பெறுவர்.
- பா வகைகளை அறியச் செய்தல்.
- செய்தல் மரபுக் கவிதை எழுதும் திறன் பெறுவர்.
- கவிதை வடிவங்களை அறிவர்.
- பாப்புனையும் திறன் பெறுவர்.

EC I மூலிகை மருத்துவம்

கற்றல் விளைவுகள் (Course Outcomes)

- மூலிகை மருத்துவத்தினை அறிமுகம் பெறுவர்.
- மூலிகை மருத்துவச் சிறப்புகளை உணர்வர்.
- மூலிகைகளின் பயன்பாட்டினை அறிந்துகொள்வர்.
- மாற்று மருத்துவ முறைகளில் விழிப்புணர்வை ஏற்படுத்துதல்.
- சுய வேலை வாய்ப்புப் பெறுவர்.

EC I பணித்தேர்வுத் தமிழ்

கற்றல் விளைவுகள் (Course Out Come)

- அரசுப் பணிகளுக்கு நடத்தப்படும் தேர்வுகள் குறித்து தெரிந்துகொள்வர்.
- பணித்தேர்வுகளுக்குப் படிக்கும் முறையினை அறிந்துகொள்வர்.

- இலக்கிய,இலக்கங்களில் பணிதேர்வுக்கேற்ற பயிற்சி பெறுவர்.

NMEC II ஊடகவியல்

கற்றல் விளைவுகள் (Course Outcomes)

- ஊடகத்துறையில் ஆர்வம் கொள்வர்.
- ஊடக வேலை வாய்ப்புக்கான அடிப்படைகளை உணர்வர்.
- ஊடகத்துறை குறித்த விரிவான அறிவுத்திறனால் ஊடகத்துறைகளில் வேலைவாய்ப்பு பெறுவர்.

ஆறாம் பருவம்

CC XI காப்பிய இலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- காப்பியங்கள் தமிழ் மொழி வளர்ச்சிக்கு எவ்விதம் பணியாற்றியது என்பதை தெரிந்து கொள்வர்
- சமய தத்துவங்களை அறிந்து கொள்வர்.
- பெண்மையின் பெருமையினை , சிறப்புகளை அறிந்து போற்றுவர்.

CC XII தண்டியலங்காரம்

கற்றல் விளைவுகள் (Course Outcomes)

- கவிதை அழகியல் பற்றிய அறிவு பெறுவர்.
- கவிதை இன்பம் சுவைக்கும் தன்மை பெறுவர்.
- அணி நுட்பங்களை அறிவர்.
- உவமை உருவகம் என இலக்கிய உத்திகளோடு கவிதை எழுதும் திறன் பெறுவர்

CC XIII சங்க இலக்கியம்

கற்றல் விளைவுகள் (Course Outcomes)

- அகவாழ்வியல் நுட்பங்களை உணர்ந்து அக வாழ்க்கையைச் செம்மைப் படுத்திக்கொள்வர்.
- திணைக் கோட்பாட்டுச் சிறப்பினை அறிவர்.
- பழந்தமிழரின் அரசியல் நெறிகளின் மேன்மையை அறிவர்.
- அற நெறி மானிட வாழ்வை மேம்படுத்தும் என்பதை உணர்வர்.
- மனித உறவுகளின் மாண்பினை உணர்வர்.

EC II திருக்குறள்

கற்றல் விளைவுகள் (Course Out Come)

- அறக்கோட்பாட்டுடன் வாழ்வதன் சிறப்பினை உணர்வர்.
- வாழ்வியல் முறைகளை அறிந்து சிறப்பர்.

ECIII சுற்றுலாவியல்

கற்றல் விளைவுகள் (Course Outcomes)

- ஒவ்வொரு இடத்தின் சிறப்புகளை, பண்பாடு பழக்கவழக்கங்களை அறிந்து கொள்ளுவர்.
- உள்நாடு மற்றும் வெளிநாடு சுற்றுலாவின் பெறப்படும் அனுபவங்களைஅறிவர்.
- கூடுதல் மொழி அறிவைப் பெற்று பண்பாட்டுக் கூறுகளை அறிந்து சுற்றுலா வழிகாட்டியாதல்.

ECIII கணினித்தமிழும் இணையப் பயன்பாடும்

கற்றல் விளைவுகள் (Course Outcomes)

- கணினிப் பயன்பாடு குறித்தும் அதன் பயன்களை அறிந்துகொள்வர்.
- இணையப் பயன்பாட்டின் தேவையை உணர்வர்.
- கல்வி,அலுவலகப் பணிகளில் கணினியைக் கையாளும் திறன் பெறுவர்.

M.A. Tamil
Course Structure and Syllabus under CBCS

(For the candidate admitted from the academic year 2019-2020 onwards)

Sem.	Course	Course Title	Ins. Hrs/P	Credit	Exam. Hrs.	Marks		Total
						Int.	Ext.	

			er Week					
I	Core CourseI	இக்கால இலக்கியம் - 1	6	4	3	25	75	100
	Core Course II	இக்கால இலக்கியம் -2	6	4	3	25	75	100
	Core Course III	சிற்றிலக்கியம்	6	4	3	25	75	100
	Core Course IV	சமய இலக்கியம்	6	4	3	25	75	100
	Core Course V	தொல்காப்பியம் எழுத்ததிகாரம்இளம்பூரணர் உரை	6	4	3	25	75	100
		Total	30	20				500
II	Core Course VI	காப்பிய இலக்கியம்	6	4	3	25	75	100
	Core Course VII	அற இலக்கியம்	6	4	3	25	75	100
	Core CourseVIII	சங்க இலக்கியம்I எட்டுத்தொகை	6	4	3	25	75	100
	Core Course IX	தொல்காப்பியம்சொல்லதி காரம்சேனாவரையர் உரை	6	4	3	25	75	100
	Open Elective Course I	*1. பெண்ணியம் 2.தமிழகக்கலைகளும்பண் பாடும்	6	4	3	25	75	100
		Total	30	20				500

III	Core Course X	சங்க இலக்கியம்II பத்துப்பாட்டு	6	5	3	25	75	100
	Core Course XI	ஒப்பீட்டுநோக்கில் உலகச் செம்மொழிகள்	6	5	3	25	75	100
	Core Course XII	தொல்காப்பியம் பொருளதிகாரம் முன் 5 இயல்கள் நச்சினார்க்கினியர் உரை	6	5	3	25	75	100
	Elective Course I	*1.மொழிபெயர்ப்பியல் 2.பொது மொழியியல்	6	5	3	25	75	100
	Elective Course II	*1.பெரியாரியல்**2.**இந்தியத் தத்துவ இயல்	6	5	3	25	75	100
		Total	**30**	**25**				**500**
IV	Core Course XIII	இலக்கியக் கொள்கைகளும் திறனாய்வும்	5	5	3	25	75	100
	Core Course XIV	தொல்காப்பியம் பொருளதிகாரம் - பின் 4 இயல்கள்-பேராசிரியர் உரை	5	5	3	25	75	100
	Elective Course III	* 1. ஊடகவியல் 2.தமிழ் அச்சுக் கலை	6	5	3	25	75	100
	Elective Course IV	* 1.உலக இலக்கியங்கள் 2. இந்திய இலக்கியங்கள்	6	5	3	25	75	100
	Project		8	5				100
		Total	**30**	**25**				**500**
		Total	**120**	**90**				**2000**

நோக்கங்கள்(Programme Objectives)

- தமிழோடு தொடர்புடைய அரசுத்துறைகள், தனியார் துறைகளில் பணியாற்றுவதற்கேற்ற அடிப்படைத் தகுதிக்கான கல்வியை வழங்குதல். தமிழியல் சார்ந்த துறைகளில் சுய வேலை வாய்ப்புகளை ஏற்படுத்திக் கொள்வதற்கான துறைகளை இனம் காட்டுதல், அதற்கான கல்வியை வழங்குதல்.
- தங்கள் பணி நிலைகளில் செம்மையாகப் பணியாற்றுவதற்குரிய கல்வித் திறன், நிர்வாகத்திறன், ஆளுமைப் பண்புகளைப் பெறச்செய்தல்.
- இல்ல வாழ்வியல், பணியிட உறவுகள், சமுதாயத் தொடர்புகள் முதலான நிலைகளில் அன்பும், மனிதநேயப் பண்பும், பெற்றுத் திகழ்ந்திடச் செய்தல்.
- நாட்டுப்பற்று, மொழிப்பற்று, அரசியல் விழிப்புணர்வு, சமுதாயப் பொறுப்புணர்வு,சூழலியல்அக்கறை, சமத்துவ, சகோதரத்துவ எண்ணங்களை வளர்த்துக் கொள்பவர்களாக பட்டதாரிகளை உருவாக்குதல்.
- அறவழிப்பட்ட வாழ்வியல் நோக்கமும், உயர்ந்த வாழ்வியல் குறிக்கோள்களும் கொண்டவர்களாகத் திகழ்ந்திடச் செய்தல்.
- மனித குல மேம்பாட்டுக்கு அடித்தளமிடும் இலக்கியப் படைப்பாளிகளாகத் திகழ்ந்திடும் வேட்கையையும் ஆற்றலையும் பெறச்செய்தல்.

முதுகலைப் படிப்பின் கல்விசார் விளைவுகள்(PEO)

- முதுகலைபயில்பவர்கள் எழுத்து,சொல் இலக்கணங்களை முழுமையாகவும் விரிவாகவும் பயில்வதால் மொழித்திறன் மிக்கவர்களாகத் திகழ்வர்.
- சிறந்த இலக்கியப் பயிற்சியைப்பெறுவர்.
- படைப்பிலக்கியத் திறன் மிக்கவர்களாகத் திகழ்வார்.
- வாழ்வியல்நுட்பங்களை அறிந்துகொள்வதால் உயர்ந்த வாழ்வியல் குறிக்கோள்களுடன் வாழ்வில் வெற்றி பெறுவர்.திறம்படப் பணியாற்றும் திறன் பெறுவர்.
- சமூக அக்கறையுடனும் அற உணர்வுடனும் திகழ்வர்.

முதுகலைப் படிப்பின் குறிப்பிடத்தக்க விளைவுகள்(PSO)

- பள்ளிகள், கல்லூரிகள், பல்கலைக்கழகங்களில் ஆசிரியர் பணிக்குரிய அடிப்படைத் தகுதி பெறுவர்.
- தமிழ் வளர்ச்சித்துறை, அறநிலையத்துறை, செய்தி தகவல் தொடர்புத்துறை, மொழிபெயர்ப்புத்துறை முதலான தமிழோடு தொடர்புடையஅரசுத்துறைகளில் பணிவாய்ப்பு பெறுவர்.
- ஊடகத்துறை போன்றதமிழோடு தொடர்புடைய தனியார் துறைகளில் பணிவாய்ப்பு பெறுவர்.
- அச்சகத்துறைபோன்ற துறைகளில்சுய வேலைவாய்ப்பை ஏற்படுத்திக் கொள்வர்.
- ஆய்வியல் நிறைஞர், முனைவர் பட்ட ஆய்வு மேற்கொள்வதற்கான தகுதியும் திறனும் பெறுவர்.

Course Outcomes(Cos)

முதற்பருவம்

CC Iஇக்கால இலக்கியம் -1(கவிதை,நாடகம், பயண இலக்கியம்)

கற்றல் விளைவுகள் (Course OutCome)

- மனித உறவின் தன்மைகளையும் சிறப்பினையும் அறிந்துகொள்வர் .
- இயற்கையைப் போற்றும் உணர்வு பெறுவர்.
- கவிதைப் போக்கின் பல்வேறு வளர்ச்சி நிலையினை அறிந்துகொள்வர்.
- புத்திலக்கியத்தின் புதுமைகளை அறிவர்.
- காப்பிய, வரலாற்று மாந்தர்களை நவீன மொழியில் நாடகமாக்கும் உத்திகளை அறிவர்.
- உலகத்தின் பல்வேறு நாடுகளின் வளர்ச்சிகளையும் மாந்தர்களின் பண்பு நலன்களையும் அறிவர்
- இன்றைய இலக்கியப் படைப்புச் சூழலை அறிந்து கொள்வதால் படைப்பிலக்கியவதிகளாகத் திகழ்ந்திடும் ஆர்வம் பெறுவர்.

CCII இக்கால இலக்கியம் -II உரைநடை,புனைகதை

கற்றல் விளைவுகள் (Course OutCome)

- தமிழ் உரைநடையில் திறன் பெறுவர்.
- காப்பியப் பயில்வில் தெளிவு பெறுவர்.
- தமிழ் உரைநடை வரலாற்றினை அறிந்துகொள்வர்.
- சிறுகதை உத்திகளை அறிந்து படைப்பாக்க முயற்சியில் ஈடுபடுவர்.
- புதின இலக்கியக் கதைக் களங்களில் தெளிவு பெறுவர்.
- தமிழ் ஆளுமைகள் அவர்களின் படைப்புப் பின்னணி குறித்து அறிந்துகொள்வர்.

CC III சிற்றிலக்கியம்

கற்றல் விளைவுகள் (Course OutCome)

- இடைக்கால இலக்கியப் படைப்புச் சூழலை அறிந்து கொள்வதால் இலக்கிய வளர்ச்சிப் போக்கின் மாற்றங்களை அறிந்துகொள்வர்.
- படைப்பிலக்கிய வகைமை உத்திகளை அறிந்துகொள்வர்.
- இயற்கை வளத்தினை அக்கால மக்கள் போற்றிய திறத்தினை அறிந்துகொள்வர்.
- சிறந்த சிற்றிலக்கியங்கள் குறித்துத் தெளிவு பெறுவர்.

CC IV சமய இலக்கியம்

கற்றல் விளைவுகள் (Course OutCome)

- ஆன்மீக அருளாளர்களின் மெய்மையான தொண்டுகளை அறிவர்.
- அற உணர்வே ஆன்மீகத்தின் அடிப்படையாக இருக்கவேண்டும் என்பதை அறிவர்.
- பிறருக்கு உதவுதலும் அன்பு காட்டுதலும் சமயத்தின் அடிப்படை என்பதை உணர்வர்.
- சமய நல்லிணக்க உணர்வு பெறுவர்.

CC Vதொல்காப்பியம் – எழுத்ததிகாரம்- இளம்பூரணம்

கற்றல் விளைவுகள் (Course OutCome)

- தமிழ் மொழித்திறனில் மேம்பாடடைவர்.
- எழுத்திலக்கணக் கோட்பாடுகளை அறிந்துகொள்வர்.
- தமிழில் கலந்துள்ள பிறமொழிச் சொற்கள் பலவற்றை எளிதில் இனம் காண்பர்.
- தமிழ் எழுத்துக்களின் ஒலிப்பு முறை குறித்த தெளிவு பெறுவர்.
- தமிழ் எழுத்திலக்கண மரபில் தேர்ச்சி பெறுவர்.

இரண்டாம் பருவம்

CC VIகாப்பிய இலக்கியம்

கற்றல் விளைவுகள் (Course OutCome)

- காப்பிய இலக்கியக் கட்டமைப்பு, காப்பிய உத்திகளை அறிந்து கொள்வர் .
- காலந்தோறும் காப்பியப் பாடுபொருள்களில் நிழ்ந்துள்ள மாற்றங்கள் அவற்றிற்கான தேவைகள் குறித்து உணர்வர்.
- அக்கால அரசியல், சமுதாயச் சூழல்களை அறிந்துகொள்வர்.
- இயற்கைச் சூழல்களைப் பாதுகாக்க வேண்டியதன் இன்றியமையாமையை உணர்வர்.
- சொல்லாடல் திறன் பெறுவர்.

CC VII அற இலக்கியம்

கற்றல் விளைவுகள் (Course OutCome)

- அற இலக்கியம் தோன்றுவதற்கான அரசியல், சமுதாய, வாழ்வியல் சூழல்களை அறிந்துகொள்வர்.
- தமிழரின் அறக் கோட்பாடுகளின் தனித்தன்மைகளையும் சிறப்புகளையும் அறிந்து கொள்வர்.
- அறப் பண்புகளை வளர்த்துக்கொண்டு வாழ்வில் மேன்மையடைவர்.
- தனித் திறன்களை மேம்படுத்திக் கொள்வர்.

- நிர்வாகத் திறன் பெறுவர்.
- வாழ்வியல் முறைகள் காலந்தோறும் மாற்றத்திற்கு உட்பட்டவை என்பதில் தெளிவு பெறுவர்.

CC VIIIசங்க இலக்கியம் - 1(எட்டுத்தொகை)

கற்றல் விளைவுகள் (Course OutCome)

- தமிழர் தம் அக வாழ்வியல் அழகியலை அறிந்துகொள்வர்.
- அகவாழ்வியல் நுட்பங்களை உணர்ந்து அக வாழ்க்கையைச் செம்மைப் படுத்திக்கொள்வர்.
- திணைக் கோட்பாட்டுச் சிறப்பினை அறிவர்.
- பழந்தமிழரின் அரசியல் நெறிகளின் மேன்மையை அறிவர்.
- அற நெறி மானிட வாழ்வை மேம்படுத்தும் என்பதை உணர்வர்.
- மனித உறவுகளின் மாண்பினை உணர்வர்.
- சுருங்கச் சொல்லி விளங்க வைக்கும் கலையில் தேர்ச்சி பெறுவர்.
- சிறந்த மனித வாழ்வுக்கு அடிப்படையான பல்வேறு கூறுகளை அறிந்துகொள்வர்.
- தமிழர்தம் தொன்மையான இலக்கியச் செழுமையை உணர்வர்.
- 1□. பழந்தமிழ் இலக்கியம் கற்பிக்கும் வல்லமை பெறுவர்.

CCIXதொல்காப்பியம் – சொல்லதிகாரம்– சேனாவரையம்

கற்றல் விளைவுகள் (Course OutCome)

- சொல்லிலக்கணக் கோட்பாடுகளில் தெளிவு பெறுவர்.
- மொழித்திறனில் வல்லமை பெறுவர்.
- சொற்களின் வகைகள், பயன்பாட்டு நிலைகளை அறிவர்.
- தொடராக்க வல்லமை பெறுவர்.
- தமிழர்களின் சொல்லிலக்கணக் கோட்பாடு தகவல் நோக்கம் மட்டுமன்றி வாழ்வியல் நோக்கங்களையும் உள்ளடக்கியது என்பதை உணர்வர்.
- பெரியோர் கருத்துகளில் மதிப்பு கொள்வர்.
- கருத்துரைக்கும், கருத்து மறுக்கும் முறைகளில் உயர் பண்பு பெறுவர்.

OECI பெண்ணியம்

கற்றல் விளைவுகள் (Course OutCome)

- பாலினச் சமத்துவ உணர்வு பெறுவர்.
- பாலினச் சமத்துவத்தின் தேவையை உணர்வர்.
- பாலினச் சமத்துவ வரலாற்றில் சான்றோர் செய்துள்ள முயற்சிகளை அறிவர்.
- இல்லற, சமுதாய வாழ்வின் மேன்மைக்குப் பாலினச் சமத்துவம் முதன்மையானது என்ற உணர்வைப் பெறுவர்.
- நவீன இலக்கியப் படைப்பு முறைகள், திறனாய்வு முறைகள் குறித்துத் தெளிவு பெறுவர்.
- பெண்ணிய நோக்கிலான ஆய்வுகளை மேற்கொள்ள ஊக்கம் பெறுவர்.

OECI தமிழகக் கலைகளும் பண்பாடும்

கற்றல் விளைவுகள் (Course OutCome)

- தமிழகக் கலைகள் குறித்து அறிந்துகொள்வதால் குறிக்கத் தக்க அல்லது இன்றைய பயன்பாட்டுக்கு உகந்த கலைகளில் உள்ள தொழில் வாய்ப்புகளை அறிவர்.
- அழகுக் கலைகள் சார்ந்த தொழில் வாய்ப்புகளை அறிவர்.
- கலைகளுக்கும் பண்பாட்டுக்குமான தொடர்பை உணர்வதால் கலை வளர்ச்சிக்குத் துணை புரிவது குறித்துச் சிந்திப்பர்.
- தமிழர் தம் பண்பாட்டுக் கூறுகளை அறிந்துகொள்வதால் பண்பட்ட வாழ்வியல் கூறுகளைப் பின்பற்றவேண்டும் என்றஎண்ணத்தினை ஏற்படுத்திக் கொள்வர்.
- இருபதாம் நூற்றாண்டின் பண்பாட்டு மாற்றத்தில் ஊடகங்களின் பின்புலம் குறித்து அறிவதால் ஊடகத் தாக்கங்களில் விழிப்புணர்வு கொள்வர்.

மூன்றாம் பருவம்

CCX சங்க இலக்கியம் - 2பத்துப்பாட்டு

கற்றல் விளைவுகள் (Course OutCome)

- இயற்கையோடியைந்த வாழ்வே பழந்தமிழரின் வாழ்வியலில் முதன்மை

பெற்றிருந்தமையை அறிவர்.

- ஆறுகளையும், இயற்கை வளங்களையும் பழந்தமிழர் போற்றி வாழ்ந்தனர் என்பதை அறிந்துகொள்வர்.
- பழந்தமிழரின் செல்வ வளத்தையும், கடல் கடந்த வணிகச் சிறப்பையும் அறிவர்.
- பழந்தமிழ் இலக்கியம் பயிலும் வல்லமை பெறுவர்.
- பழந்தமிழரின் அரசியல் அறத்தையும், வெற்றிச் சிறப்பையும் அறிவர்.
- ஈதல், இசைபட வாழ்தலே மனித வாழ்வியலின் தலையாய நோக்கம் என்பதை உணர்வர்.

CCXI ஒப்பீட்டு நோக்கில் உலகச் செம்மொழிகள்

கற்றல் விளைவுகள் (Course OutCome)

- உலகச் செம்மொழி இலக்கியங்கள் குறித்து அறிமுகம் பெறுவர்.
- தமிழ் மொழியின் இலக்கியவளத்தை அறிவர்.
- ஒப்பீடு ஆய்ந்துணரும் திறன் பெறுவர்.
- உலக அளவில் தனித்த சிறப்புடைய தமிழின் பெருமையை உணர்வர்.
- மானுட விழுமியங்களே பழந்தமிழ் இலக்கியங்களில் முதன்மை பெற்றிருந்தமையை உணர்வர்.
- செம்மொழிப் பண்புகள் அனைத்தும் உடைய மொழி தமிழ் என்பதை அறிந்துகொள்வர்.

CC XIIதொல்காப்பியம் – பொருளதிகாரம் - முன் 5 இயல்கள் நச்சினார்க்கினியம்

கற்றல் விளைவுகள் (Course OutCome)

- பொருள் இலக்கண அடிப்படைகளை உணர்வர்.
- அகத்திணைக் கோட்பாடுகளின் வழி அக வாழ்வியல் கூறுகளை அறிவர்.
- அக்காலப் போர்முறைகள், மன்னர் - படை வீரர்கள் உறவு நிலை முதலியவற்றை அறிந்துகொள்வர்.
- புறத்திணைப் பாகுபாட்டில் வாழ்வியல்கூறுகள் பொதிந்துள்ளமையை உணர்வர்.
- தமிழர்கள் பொருள் இலக்கணக் கோட்பாட்டில் மானிட வாழ்வின் உயர்வே

முதன்மை பெற்றிருந்தமயை உணர்வர்.

- சங்க இலக்கியங்களை முறையாகப் பயிலும் ஆற்றல் பெறுவர்.

ECI மொழி பெயர்ப்பியல்

கற்றல் விளைவுகள் (Course OutCome)

- மொழிபெயர்ப்புத் துறையில் பணிவாய்ப்புபெறத் தகுதி பெறுவர்.
- மொழிபெயர்ப்பின் இன்றைய தேவைகளை உணர்வர்.
- மொழிபெயர்ப்பின் தன்மைகள், வகைகள் குறித்துத் தெளிவு பெறுவர்.
- மொழிபெயர்ப்பாளரின் தகுதிகளை அறிந்துகொண்டு மொழிபெயர்ப்புத் திறன்களை வளர்த்துக் கொள்வர்.
- மொழி பெயர்ப்பு ஒரு கலை என்பதை உணர்ந்து அதன் நுட்பங்களைக் கற்றுக்கொள்வர்.

ECIபொது மொழியியல்

கற்றல் விளைவுகள் (Course OutCome)

- மொழியியல் குறித்த அறிவு பெறுவர்.
- மொழியின் கட்டமைப்பினை உணர்வதால் மொழித்திறனில் வல்லமை பெறுவர்.
- ஒலியியல், உருபனியல் கோட்பாடுகளை அறிந்துகொள்வதால் இலக்கணத் தெளிவு பெறுவர்.
- தொடரியல் தொடரமைப்பு குறித்துத் தெளிவு பெறுவதால் படைப்பிலக்கிய ஆற்றல் பெறுவர்.
- மொழியியல் கற்பதால் பிறமொழிகளை ஏளிதில் கற்கும் வல்லமை பெறுவர்.

ECII பெரியாரியல்

கற்றல் விளைவுகள் (Course OutCome)

- சமுதாயச் சீர்திருத்தச் சிந்தனைகளை வளர்த்துக்கொள்வர்.
- சமுதாயச் சீர்திருத்த வரலாற்றை அறிந்துகொள்வர்.
- பாலினச் சமத்துவ உணர்வு பெறுவர்.
- சாதி வேறுபாட்டு உணர்வின் குறைகளையும், தீமைகளையும் உணர்வர்.
- பொருளாதாரச் சமத்துவத்தின் மீது விருப்பம் கொள்வர்.

- பகுத்தறிவுச் சிந்தனைகளை வளர்த்துக்கொள்வர்.

ECII இந்தியத் தத்துவ இயல்

கற்றல் விளைவுகள் (Course OutCome)

- கருத்துநிறுவுதல் கருத்துமறுத்துரைத்தலில் ஆற்றல்பெறுவர் கொள்வர்.
- இந்தியத் தத்துவ வரலாற்றை அறிந்துகொள்வர்.
- இந்தியத் தத்துவக் கோட்பாடுகளை அறிவர்.
- சமயங்களுக்கும் தத்துவங்களுக்குமான தொடர்பை அறிந்துகொள்வர்.
- சமயங்களுக்கும் இலக்கியங்களுக்குமான தொடர்பை அறிந்து கொள்வர்.

நான்காம் பருவம்

CCXIII இலக்கியக் கொள்கைகளும் திறனாய்வும்

கற்றல் விளைவுகள் (Course OutCome)

- இலக்கியக் கொள்கைகள் காலமாற்றத்திற்கேற்ப மாற்றமும் வளர்ச்சியும் பெற்றுள்ளமையை அறிந்துகொள்வர்.
- சங்க இலக்கியக் கொள்கைகள் முழுமையான மனித வாழ்வியலோடு இணைந்ததாக இருந்தமையை உணர்வர்.
- மனித சமுதாயக் குறைபாடுகளைக் களைந்து, வாழ்வியல் விழுமியங்களை எடுத்துரைப்பதே அற இலக்கியக் கொள்கைகளாக விளங்கியமையை உணர்வர்.
- சமயப் பின்னணிகளும் பல்வேறு சமயங்களின் தோற்றமும் வருகையும் புதிய இலக்கிய வகைமைகளைப் பாடும் முயற்சியும் சமய இலக்கிய, சிற்றிலக்கியக் கொள்கை உருவாக்கத்திற்குக் காரணம் என்பதை அறிவர்.
- அரசியல், சமுதாயப் பின்னணிகளே இக்கால இலக்கியக் கொள்கைகளை உருவாக்கம் செய்தன என்பதை அறிந்துகொள்வர்.

CC XIVதொல்காப்பியம் – பொருளதிகாரம் - பின் 4 இயல்கள்

பேராசிரியம்

கற்றல் விளைவுகள் (Course OutCome)

- கவிதைச் சுவையுணர் திறன்பெறுவர்.

- இலக்கியத்தில் அணிகளின் இன்றியமையாமையையும், அணிகளின் பயன்பாட்டு முறைகளையும் அறிந்துகொள்வர்.
- யாப்பிலக்கணத்தில் தெளிவு பெறுவர்.
- மரபுக் கவிதையாக்கத் திறன் பெறுவர்.
- மரபு இலக்கியப் பயில்திறன் பெறுவர்.

ECIII ஊடகவியல்

கற்றல் விளைவுகள் (Course OutCome)

- ஊடகத்துறையில் பணிவாய்ப்பு பெறும் திறன் பெறுவர்.
- செய்தி ஊடங்கள் அரசியல், சமுதாயக் களங்களில் ஏற்படுத்தும் விளைவுகளை அறிந்துகொள்வதால் ஊடகத்துறையில் ஆர்வம் கொள்வர்.
- தமிழ் இலக்கியப் பயிற்சியும், இலக்கியத் திறன் மேம்பாடும் ஊடகத்துறை வேலை வாய்ப்புக்குத் துணைபுரியும் என்பதை உணர்வர்.
- தமிழ் இலக்கண அறிவு ஊடக வேலை வாய்ப்புக்கான அடிப்படை என்பதை உணர்வர்.
- படைப்பிலக்கியத் திறனை வளர்த்துக்கொள்ளும் ஆர்வம் பெறுவர்.
- ஊடகத்துறை குறித்த விரிவான அறிவுத்திறனால் ஊடகத்துறைகளில் வேலைவாய்ப்பு பெறுவர்.

ECIII தமிழ் அச்சுக்கலை

கற்றல் விளைவுகள் (Course OutCome)

- சுயவேலை வாய்ப்பினைஏற்படுத்திக்கொள்வர்.
- அச்சகத் துறையின்அடிப்படைகளை அறிவர்.
- அச்சாக்கத்தின் அனைத்துக் கூறுகளிலும் தெளிவு பெறுவர்.
- கணினி அச்சு முறைகளில் தேர்ச்சி பெறுவர்.
- பல்வேறு அச்சாக்க முறைகளில் அறிமுகம் பெறுவர்.

ECIVஉலக இலக்கியங்கள்

கற்றல் விளைவுகள் (Course OutCome)

- உலக இலக்கியங்களில் அறிமுகம் பெறுவர்.
- புதிய இலக்கிய உத்திகளையும், உலக இலக்கியப் போக்குகளையும் அறிந்துகொள்வர்.
- புகழ்பெற்ற உலகப் படைப்புகளைக் கற்கவேண்டிய தேவையை உணர்வர்.
- நவீன இலக்கிய வடிவங்களுக்கான அடிப்படைகளை அறிந்துகொள்வர்.
- ஒப்பிலக்கிய ஆய்வுகளை மேற்கொள்ளும் ஆர்வம்கொள்வர்.
- மொழிபெயர்ப்பின் தேவைகளை உணர்வர்.

ECIV இந்திய இலக்கியங்கள்

கற்றல் விளைவுகள் (Course OutCome)

- இந்திய இலக்கியப் படைப்புகளின் வழி இந்திய மக்களின் வாழ்வியல் குறித்து அறிந்துகொள்வர்.
- இந்திய மொழி இலக்கியப் படைப்புகளுக்கிடையேயுள்ள ஒற்றுமை வேற்றுமைகளை அறிவர்.
- புகழ்பெற்ற இந்திய இலக்கிய ஆளுமைகளை அறிந்துகொள்வர்.
- மொழி பெயர்ப்பின் தேவையை உணர்வர்.

UG Programme B.Com., (Commerce) – Curriculum Framework
(For the Candidates admitted from 2019 – 2020 onwards)

Sem.	Part	Code	Title of the Course	Hrs/ Wk	Credits	Marks		
						Int.	Ext.	Ext.
I	I	LC	LC I - Tamil I	6	3	25	75	100
	II	ELC	ELC II - English I	6	3	25	75	100
	III	CC	CC I –Business Accounting	6	4	25	75	100
		CC	CC II –Business Environment and Ethics	5	4	25	75	100
		AC	AC I – Business Economics	5	4	25	75	100
	IV	VE	VE - Value Education	2	2	25	75	100
	Total		**6**	**30**	**20**	**150**	**450**	**600**
II	I	LC	LC II – Tamil II	6	3	25	75	100
	II	ELC	ELC II - English II	6	3	25	75	100
	III	CC	CC III – Statistical Methods	5	4	25	75	100
		AC	AC II – Modern Banking Practices	5	4	25	75	100
		AC	AC III – Principles of Marketing	4	4	25	75	100
	IV	EVS	SKBC I – Commercial Correspondence	2	2	25	75	100
		SKBC	Environmental Studies	2	2	25	75	100
	Total		**7**	**30**	**22**	**175**	**525**	**700**
III	I	LC	LC III - Tamil III	6	3	25	75	100
	II	ELC	ELC III - English III	6	3	25	75	100
	III	CCL	CCL IV – Computer Application in Business	6	4	40	60	100
		AC	CC V – Auditing Principles and Practice	5	4	25	75	100
		AC	AC IV – Commercial Law	5	4	25	75	100
	IV	SKBC	SKBC II – Advertising and Salesmanship	2	2	25	75	100
		GS	GS - Gender Studies	-	1	25	75	100
	Total		**7**	**30**	**21**	**165**	**535**	**700**

Sem.	Part	Code	Title	Hrs /Wk	Credits	Marks		
						Int.	Ext.	Tot.
IV	I	LC	LC IV - Tamil IV	6	3	25	75	100
	II	ELC	ELC IV - English IV	6	3	25	75	100
	III	CC	CC VI – Financial Accounting	6	4	25	75	100
		CC	CC VII –Introduction of GST	4	3	25	75	100
		AC	AC V –Company Law	3	4	25	75	100
		AC	AC VI – Business Management	3	4	25	75	100
	IV	NMEC	NMEC I – Fundamentals of Accounting	2	2	25	75	100
		SSC	SSC - Soft Skill Course	-	2	-	100	100
		Total	**8**	**30**	**25**	**175**	**625**	**800**
V	III	CCL	CCL VIII – Computerized Accounting	6	5	40	60	100
		CC	CC IX – Cost Accounting	5	4	25	75	100
		CC	CC X – Income Tax Law and Practice	6	4	25	75	100
		CC	CC XI – Corporate Accounting	6	5	25	75	100
		EC	EC I**	5	5	25	75	100
	IV	NMEC	NMEC II – General Commercial Knowledge	2	2	25	75	100
	Extra Credit		EXCL 1 – R Programme	2	2	-	100	100
		Total	**6+1**	**30 +2**	**25+2**	**165**	**535**	**600 +100**
VI	III	CC	CC XII – Management Accounting	5	4	25	75	100
		CC	CC XIII –Financial Management	5	4	25	75	100
		CC	CC XIV – Entrepreneurial Development	5	4	25	75	100
		CC	CC XV – Industrial Relations and Regulations	5	4	25	75	100
		EC	EC II**	5	5	25	75	100
		EC	EC III**	5	5	25	75	100
	IV	EA	Extension Activities	-	1	-	-	-
	Extra Credit		EXC 2 – Group Project	-	2	50	50	100
		Total	**7+1**	**30**	**27+2**	**150 + 50**	**450 + 100**	**600+ 100**
TOTAL			**41+2**	**180 +4**	**140+ 4**	**980 + 50**	**3020+150**	**4000 +200**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1: To attain professional expertise by being competent, creative and ever ready to accept new and challenging roles in Industry and Academics.

PEO 2: To imbibe the entrepreneurial traits in order to embrace innovative opportunities by applying emerging technology, leadership in the process of start-up of a Small Scale Industry.

PROGRAMME OUTCOME (PO)

PO 1: To become knowledgeable in the subject of Commerce and apply the principles of the same to the needs of the Employer / Institution/ Enterprise / Society.

PO 2: To gain Analytical skills in the field of accounting and business

PO 3: To understand and appreciate professional ethics, community living and Nation building initiatives.

PO 4: To develop an understanding of commerce and apply the skills in a continuously changing business environment.

PO 5: To train the students with the much needed business education, so that they are more competitive for employment and higher education and they are work ready upon graduation

PO 6: To build the necessary competencies and creativity and prepare them to undertake entrepreneurship as a desirable and feasible career option.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: To apply the knowledge of Commerce in the domain of Accounting /Business/Technology

PSO 2: To solve the complex problems in the field of Commerce with an understanding of the societal, legal and cultural impacts of the solution

PSO 3: To facilitate students with skills and abilities to become competent and competitive to be assured of good careers and job placements.

PSO 4: To develop entrepreneurship and managerial skills in students so as to enable them to establish and manage their business effectively.

PSO – 5: To develop self -confidence and awareness of general issues prevailing in the society.

PSO – 6: To recognize and understand the ethical responsibility of individual and organization in the society

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CC I - BUSINESS ACCOUNTING	**CO – 1:** recollect the basic concepts, conventions, methods and techniques underlying the accounting practices. **CO – 2:** get the idea for preparing and presenting financial statements in accordance with generally accepted accounting principles. **CO – 3:** apply students' demonstrate skills in critical-thinking and problem-solving **CO – 4:** evaluate conceptual knowledge of the financial accounting and to impart skills for recording various kinds of business transactions
CC II - BUSINESS ENVIRONMENT AND ETHICS	**CO – 1:** explain the various dimensions of business environment **CO – 2:**outline how an entity operates in a business environment **CO – 3:**discuss the effects of government policy on the economic environment **CO – 4:**identify the ethical practices of business
AC I - BUSINESS ECONOMICS	**CO – 1:** recollect the functional areas of economics. **CO – 2:**understand the basic tools applied in the business economics. **CO – 3:**apply the various techniques for identifying the market condition of a firm. **CO – 4:**analyze the concept of economics equilibrium and implications of the business cycle.
CC III – STATISTICAL METHODS	**CO – 1:** collect, process, analyze and present the statistical data. **CO – 2:** acquire the knowledge of applying various statistical tools **CO – 3:** apply students' demonstrate skills in critical-thinking and problem-solving **CO – 4:**understand the necessity of various techniques for robust statistical inference
AC II – MODERN BANKING PRACTICES	**CO – 1:** keep in mind the relationship between banker and customer. **CO – 2:** understand the various products and services offered by the bank. **CO – 3:** apply the regulatory issue that arises in banking sector. **CO – 4:** evaluate ethical issues in banking and consider their implication for conduct of business.
AC III – PRINCIPLES OF MARKETING	**CO – 1:** remember the key concept and elements of marketing management. **CO – 2:** understand the role of marketing in a business context. **CO – 3:** deploy awareness and consideration of tools available to a marketer. **CO – 4:**analyze the global marketing environment and opportunities.

SKBC I – COMMERCIAL CORRESPONDENCE	**CO – 1:**remember the concept and business communication models. **CO – 2:**understand the role of communication as an avenue for business. **CO – 3:**deploy students understand how to write business letter and improve written communication **CO – 4:**interpret the ability to communicate effectively
CCL IV – COMPUTER APPLICATION IN BUSINESS	**CO – 1:** gain the basic knowledge of Microsoft Office **CO – 2:**apply designs to enhance the looks of the presentation **CO – 3:** analyze the use of Microsoft Word, Excel, PowerPoint, Photoshop and PageMaker
CC V – AUDITING PRINCIPLES AND PRACTICE	**CO – 1:** keep in mind current auditing concepts, standards and acceptable practices. **CO – 2:**comprehend preventative internal control measures. **CO – 3:**implement the audit process from planning of audit to completion of audit. **CO – 4:**interpret audit issue and make significant on computer assisted audit techniques
AC IV – COMMERCIAL LAW	**CO – 1:**remember rules and issues relating to the business. **CO – 2:**understand the fundamentals of commercial law **CO – 3:**apply the knowledge and skills in the elective area of the business law. **CO – 4:** evaluate the legal; principles and employ legal techniques to analyze competing consideration and resolve practical problems in the area of commercial law.
SKBC II – ADVERTISING AND SALESMANSHIP	**CO – 1:**keep in mind the communication objectives behind advertisement and promotion. **CO – 2:**point out the advertising and promotion strategies and tactics utilized by communicating agencies. **CO – 3:** implement skills in selecting and integrating element to create effective communication campaigns. **CO – 4:** analyze current and past advertising and promotion campaigns.

CC VI – FINANCIAL ACCOUNTING	**CO – 1:** recollect the rules for admission, retirement and death of the partner in a firm. **CO – 2:** get the idea about computation of various methods of goodwill and settlement of accounts to retiring partners. **CO – 3:** apply the rule of Garner Vs. Murray for settlement of accounts among partners after dissolution. **CO – 4:** analyses the accuracy in the preparation, presentation and interpretation of final settlement of amount to partners.
CC VII – INTRODUCTION OF GST	**CO – 1:** remember the rules and regulation of indirect taxation. **CO – 2:** understand the rules for registrations and its exemptions in taxation. **CO – 3:** implement GST and its working mechanisms. **CO – 4:** analyze and resolve tax problems.
AC V – COMPANY LAW	**CO – 1:**remember the concept about company and its promoters under Companies Act 2013 **CO – 2:**understand legal reasoning and analysis through study of statutes and regulatory practice relating to company law **CO – 3** deploy the documents maintained under Companies Act 2013 **CO – 4:**evaluate the process from formation of company to winding up of the company under company law
AC VI – BUSINESS MANAGEMENT	**CO – 1:**recollect the general framework and understand the key functions in management as applied in practice. **CO – 2:**understand the managerial performance of an organization. **CO – 3:**execute the strength, weakness, opportunities and threat of business management. **CO – 4:**evaluate organizational decision with consideration of the political, legal and ethical aspects of business.
NMEC I – FUNDAMENTALS OF ACCOUNTING	**CO – 1:**recollect the general framework and understand the key functions in accounting in practice. **CO – 2:**understand the accounting methods used in business. **CO – 3:** execute the skills to prepare different types of accounts. **CO – 4:**analyze new approach in implementation of financial statement

CCL VIII – COMPUTERIZED ACCOUNTING	**CO – 1:** understand the basic accounting concepts. **CO – 2:**get the idea about tally accounting software from the business perspective **CO – 3:**apply the basic rules and tricks to drill the transaction **CO – 4:**analyze exposure to latest technology.
CC IX – COST ACCOUNTING	**CO – 1::**keep in mind, the place and role of cost accounting in the modern economic environment. **CO – 2:**Understand the costing system, cost management system. **CO – 3:**Execute overheads problems in the allocations and apportionment. **CO – 4:**Analyze the common cost and revenues
CC X – INCOME TAX LAW AND PRACTICE	**CO – 1:**recollect the fundamental concept of income tax act 1961 **CO – 2:**get the idea of the various sources of incomes **CO – 3:**apply the income tax laws for computation of an individual's adjusted gross incomes **CO – 4::**evaluate computation tax liability of an individuals
CC XI – CORPORATE ACCOUNTING	**CO – 1:**remember the terms of accounting for amalgamation, absorption, acquisition of Companies, Internal and external reconstruction of companies. **CO – 2:**prepare consolidated accounts for a corporate group. **CO – 3:**execute the skill to prepare final accounts for a corporate group like banking companies and insurance companies. **CO – 4:**evaluate the accounting requirements for a corporate group and familiarity with the theory underlying the methods used to account for inter-company investments.
EC I (a) – SERVICES MARKETING	**CO – 1:**remember the various financial products, services, and strategies offered by various institutions. **CO – 2:**understand how the financial services component industries (insurance, banking, securities) interact. **CO – 3:**analyze the structure of the financial markets. **CO 4:** apply the knowledge of various financial products.

EC I (b) – PRINCIPLES AND PRACTICE OF INSURANCE	**CO – 1:**explain the basic principles of insurance and its importance in real life **CO – 2:** identify with the various kinds of insurance, needs and scope of each insurance policy **CO – 3:**compare various kinds of insurance plans as well as the contract selection criteria from a cost-benefit point of view. **CO 4:**familiarize themselves with major insurance products, such as life insurance, health insurance, property and liability insurance.
NMEC II – GENERAL COMMERCIAL KNOWLEDGE	**CO – 1:**understand the basic concepts of business organization **CO – 2:**familiarize the theoretical aspects of transportation and insurance sectors **CO – 3:**identify the basic idea about financing of business
EXCL 1 – R PROGRAMME	**CO – 1:**gain knowledge about different data types and different data structures in R **CO – 2:** understand basic regular expressions in R **CO – 3:**apply the various graphs in R for data visualization **CO - 4:**analyze the uses of R for descriptive statistics and inferential statistics
CC XII – MANAGEMENT ACCOUNTING	**CO – 1:**remember the concepts and importance of management accounting in decision making. **CO – 2:**understand the preparation of various types of budgets. **CO – 3:**apply the idea and practices of budgeting in a business decisions **CO – 4:**analyze financial data from annual reports of companies.
CC XIII – FINANCIAL MANAGEMENT	**CO – 1:**remember the concepts and tools of finance **CO – 2:**understand the importance of working capital and cash budgeting techniques **CO – 3:** apply techniques to project financial statements for forecasting long-term financial needs. **CO – 4:**evaluate capital investment decisions and financial policies to business valuation

CC XIV– ENTREPRENEURIAL DEVELOPMENT	**CO – 1:** remember the legal and financial conditions as well as the importance of the entrepreneurial infrastructure for starting a business venture. **CO – 2:** understand the effectiveness of different entrepreneurial strategies. **CO – 3:** execute the entrepreneurial project and its essential elements. **CO - 4:**analyze the elements of success of entrepreneurial ventures
CC XV – INDUSTRIAL RELATIONS AND REGULATIONS	**CO – 1:**demonstrate descriptive knowledge of the field of industrial relations **CO – 2:**apply the essential concepts of industrial relations and their interrelationship at the personal, organizational and national levels. **CO – 3:**recognize and consider the social, historical and equity issues within industrial relations. **CO - 4:**investigate solutions to industrial relations problems based on research and assessment of current practices.
EC II (a) – FINANCIAL SERVICES AND DERIVATIVES MARKETS	**CO – 1:** remember the various financial products, services, and strategies offered by various institutions. **CO – 2:** think of the various derivatives products available in the markets **CO – 3:**analyze the structure of the financial markets **CO - 4:** apply the knowledge of various financial products.
EC II (b) – INTERNATIONAL TRADE AND EXPORT MANAGEMENT	**CO – 1:**remember the concepts and policies related to international business. **CO – 2:**understand the history and impact of international business **CO – 3:** execute the opportunities and challenges offered by international business. **CO – 4:**estimate various modes of entering international markets.
EC III (a) – FUNDAMENTALS OF CAPITAL MARKET	**CO – 1:**creating awareness on SEBI, its objectives, powers, management & functions. **CO – 2:** familiarizes the students with the mechanism of capital market operations. **CO – 3:** understanding the practical aspects of primary market operations & book building process **CO – 4:**familiarize the students about investment decisions and portfolio decisions

EC III (b) – HUMAN RESOURCE MANAGEMENT	**CO – 1:**remember the importance of human resource management in organizations. **CO – 2:**get the idea about training and development needed to the human resource. **CO – 3:**execute the nature and sources of conflict and different strategies, approaches used in the resolution of conflict. **CO – 4:** analyze the key issues related to administering the human elements such as motivation, performance appraisal, recruitment and training.

M.Com. Course structure under CBCS

Semester	Course code	Course (s)	Title of the Course(s)	Hrs/ week	credit	Marks		Total
						Int	Ext	
I	19PC101	CC-I	Managerial Economics	6	5	25	75	100
	19PC102	CC-II	Business Environment	6	5	25	75	100
	19PC103	CC-III	Corporate Laws	6	4	25	75	100
	19PC104	CC-IV	Advanced cost and Management Accounting	6	5	25	75	100
	19PC105A	ECC-I	Information Technology for management Lab (or)	6	4	25	75	100
	19PC105B		Retail Marketing					
			TOTAL	**30**	**23**	**125**	**375**	**500**
II	19PC206	CC-V	Advanced Financial Management	6	5	25	75	100
	19PC207	CC-VI	Computational Indirect Tax and GST Lab	6	5	25	75	100
	19PC208	CC-VII	Banking and Financial Institutions	6	4	25	75	100
	19PC209	CC-VIII	Security Analysis and portfolio management	6	5	25	75	100
	19PC210A	OEC	OrganisationalBehaviour	6	4	25	75	100
	19PC210B		Accounting for managerial decisions					
			TOTAL	**30**	**23**	**125**	**375**	**500**
III	19PC311	CC-IX	Advanced Corporate Accounting	6	5	25	75	100
	19PC312	CC-X	Research Methodology	6	5	25	75	100
	19PC313A	ECC-II	Advanced Business Statistics and Practical Lab (or)	6	4	25	75	100
	19PC313B		Advertising and Sales Promotion					
	19PC314	CC-XI	International Finance and Institutions	6	4	25	75	100
	19PC315A	ECC-III	Corporate Reporting Practices (or)	6	4	25	75	100
	10PC315B		Consumer Behaviour					
			TOTAL	**30**	**22**	**125**	**375**	**500**
IV	19PC416	CC-XII	Agricultural and Rural Marketing	6	4	25	75	100
	19PC417	CC-XIII	Corporate Ethics	6	4	25	75	100
	19PC418	CC-XIV	Human Resources Management	6	5	25	75	100
	19PC419A	ECC-IV	E- commerce Lab (or) Training and Development	6	4	25	75	100
	19PC419B							
	19PC420	CC-XV	Project work	6	5	25	75	100
			TOTAL	**30**	**22**	**125**	**375**	**500**
			GRAND TOTAL	**120**	**90**	**800**	**1200**	**2000**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1: Subject proficiency:

Every student will scope up with the latest development in contemporary, national and global level through effective transaction of the curricular and co curricular activities. Succeed in obtaining employment appropriate to their interest, education and will become productive and valued professional. Capable to Work in teams with enriched communication and intellectual skills.

PEO 2: Professional Growth:

Become full fledged accounting and finance professionals. Continue to develop professionally equipped through long-life learning, higher education and other creative pursuit in their areas of interest. Students will establish themselves as effective professionals by solving real problems.

PEO 3: Management Skill:

Students will develop strong knowledge base through active learning. Exercise leadership qualities in a responsive, ethical and innovative manner. Demonstrate professional expertise in financial planning and analysis, control support and ethics with the employees. Excel themselves in team work, effective communication and critical thinking.

PEO4: Ability to clear Professional examination:

Able to appear for Integrated professional competence (IPCC) and complete article ship, so as to enable to go for final CA. Apart from that students can clear their SET, NET and move on to teaching profession easily. Excel as the fellow and Associates of ICMA and ICSI.

PEO 5: Accommodate themselves in digital world:

Recognize the need for preparation and ability in the context of socio technological changes'- Commerce and information technology will help them to survive in digital world. Goods and Services Tax and Tally expertise makes him to hold a good position in accounting field. Develop a programme for system based applications and web base creation enterprises.

PEO 6: Multidisciplinary knowledge:

Apply the multidisciplinary knowledge through industrial training provide a sustainable competitive edge in meeting the industrial need. Students will demonstrate their ability to adapt to a rapidly changing environment by having learned and new skills and new competencies.

PEO 6: Undertake Research work:

Engage themselves in research work since they undergo project work and learnt SPSS for analysis of data. It offers opportunity to undertake research work for organizations and publish the data. Students will impart professional knowledge, inter personal and ethical responsibility and to contribute to the society through active research. Will be able to pursue research in their chosen field of marketing, finance and Human resource.

PEO 6: Social Responsibility:

Students will be a responsible citizen and lead the business with moral and ethical value. Develop an acumen which goes much beyond the purview of the curriculum requirements. Will be capable of making a positive contribution to the accountancy in public practices, Government, commerce and industry.

PROGRAM OUTCOME (PO)

PO 1: After completing two years of Masters Degree in Commerce (M.Com) Programme, students would gain a through grounding in the fundamentals of commerce and Finance

PO 2: Students will learn relevant Financial accounting reporting career skills, remember both quantitative and qualitative knowledge to their future careers in business.

PO-3: understand and utilize professional knowledge they gain in E-commerce, GST Research Tools, Export promotion and diverse knowledge in various commerce subjects for business.

PO-4: Conduct export oriented business with agricultural and rural products .

PO-5: The course offers a number of value based and job oriented courses ensures that students are trainee in to up-to-date in Data base management and system analysis and design.

PO-6: Modern tool usage for accounting, and research.

PO-7: Students will be able to demonstrate Filing returns for GST.

PO-8: Students will protect the Environment and helps in its sustainability.

PO-10: Lifelong learning

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Remember the knowledge of commerce in the domain of business field.

PSO2: Understand the complex problems in the field of accounting, taxation and
Business tactics with an understanding of societal, legal and cultural impacts of the solution.

PSO3: Apply theoretical subject knowledge gained in various commerce subjects practically in business and society.

PSO4: Execute the best practices of various commerce and accounting subjects

PSO5: To encompass the diverse knowledge of business and corporate Laws and commerce subject.

PO6: To satisfy educational entrance requirements of relevant professional bodies and to
Launch a career in taxation.

Course Outcomes (Cos)

19PC101 CC I Managerial Economics	On completion of the course, students should be able to ❖ Remember the theory of the firm to model business organizations ❖ Understand demand theory to establish the elasticity of demand ❖ Use demand estimation to forecast demand trends and change ❖ Apply production theory to manage production ❖ Use cost theory to establish short and long run behavior ❖ Describe the market structures to establish market equilibrium
19PC102 CC-II Business Environment	On completion of the course, students should be able to ❖ Know the awareness of environment need for the business. ❖ Describe various economic system ❖ Use Technological environment to succeed ❖ Evaluate foreign and domestic investment available for business ❖ Outline Industrial policies and regulations ❖ Rate various Foreign Direct Investment

19PC103 CC-III Corporate Laws	On completion of the course, students should be able to ❖ Describe SEBI regulation ❖ Outline foreign exchange Management Act ❖ Use intellectual property Act ❖ Rate environment protection Act, and Consumer protection Act
19PC104 CC-IV Advanced cost and Management Accounting	On completion of the course, students should be able to ❖ Compute cost and management accounting ❖ Plan labour cost and labour turnover techniques ❖ Compute process costing in production unit ❖ Prepare Ratio analysis for financial and research purpose ❖ Revise the knowledge on fund flow and cash flow operations ❖ Discuss responsibility accounting
19PC105A ECC-I Information Technology for Management Lab	On completion of the course, students should be able to ❖ To identify managerial challenges and opportunities for organizational advancement that may be resolved by the Application. ❖ To Define and recognize key enabling technologies in organizations. ❖ To make required personal and organizational changes to implement the new technologies. ❖ To prepare Data base.
19PC105B ECC-I Retail Marketing	❖ To Extensive understand of various factors affecting retail marketing. ❖ To Insight into functioning of Retail marketing ❖ To Identify Location mix ❖ To Evaluate location decision ❖ To Discuss Issues affecting retailing in India
19PC206 CC-V Advanced Financial Management	On completion of the course, students should be able to ❖ Outline various concepts, tools and techniques of financial management ❖ Be familiar with approaches for better utilization of financial resources and management of wealth of an organization ❖ Equip to apply the right approach in terms of decision making in different situation to manage business finance more effectively ❖ Explore different alternatives to maximize earning per share and shareholders' wealth. ❖ Estimate working capital requirement ❖ Plan capital structure of business
19PC207 CC-VI Computational Indirect Tax and GST Lab	On completion of the course, students should be able to ❖ Utilize the cognitive and technical skills to generate critical and creative ideas relating to indirect tax. ❖ Plan an Idea on the policy basis and legislative scheme of India's goods and services tax ❖ Create technical skills to examine legislative scheme, its application to commercial transactions. ❖ Rate the advantages of GST to the nation ❖ Preparing in GST registration. ❖ Compile the recent changes in GST

19PC208 CC-VII Banking and Financial Institutions	On completion of the course, students should be able to ❖ Outline banking systems in India ❖ Assess various ratios in banking system ❖ Analyze functions of Digital banking ❖ Predict risk in E banking ❖ Rate various financial institutions available ❖ Create idea on international banking system
19PC209 CC-VIII Security Analysis and Portfolio Management	On completion of the course, students should be able to ❖ Analyse various investment sources in the market ❖ Demonstrate the functions of Stock Exchange ❖ Identify security analysis approach ❖ Plan various portfolio management in investment ❖ Evaluate mutual fund operations ❖ Rate various options in derivatives
INTERNSHIP PROGRAMME	**Learning outcome** ❖ Through the internship, students are expected ❖ To gain experimental learning ❖ To gain working experience in an actual workplace environment ❖ To work in a team and to collaborate with people with diverse background. ❖ To broaden their social and cultural experience, and to develop their social and cultural values and to prepare for their life-long career.
19PC210A OEC Organisational Behaviour	On completion of the course, students should be able to ❖ Outline organizational Nature, scope and types ❖ Analyse individual personality and its determinants ❖ Discuss group behavior and factors influencing group behavior ❖ Identify interpersonal relationship ❖ Critique various conflicts and negotiations ❖ Plan various bargaining techniques.
19PC210B OEC Accounting for managerial decision	On completion of the course, students should be able to ❖ Outline organizational Nature, scope and types ❖ Analyse individual personality and its determinants ❖ Discuss group behavior and factors influencing group behavior ❖ Identify interpersonal relationship ❖ Critique various conflicts and negotiations ❖ Plan various bargaining techniques.
19PC311 CCIX Advanced corporate Accounting	On completion of the course, students should be able to ❖ Revise valuation of goodwill and shares ❖ Compare Amalgamation by merger and External reconstruction ❖ compute holding company accounts ❖ Predict NPA and recovery ❖ Use mandatory accounting standards.

19PC312 CCX Research methodology	On completion of the course, students should be able to ❖ provide an understanding of research and research process ❖ acquaint students with problem identification for research and develop research design ❖ familiarize students with the techniques of data collection, analysis of data and interpretation. ❖ set out the main elements of a potential research, instrument for testing the hypotheses, including a critical and comparative analysis of the proposed theory ❖ set out limits and implications of a research study in preliminary form ❖ prepare a mini dissertation research project.
19PC313A ECC-II Advanced Business statistics and Practical Lab	On completion of the course, students should be able to ❖ Revise statistical concepts and analytical tools in statistics ❖ Utilize basic statistical estimation and analysis on business and economic data. ❖ Demonstrate sampling techniques ❖ Apply various tests and finding their significance ❖ Analyze business and statistical data with statistical software ❖ Demonstrate capabilities as problem solving, critical thinking and communication skills related to statistics ❖ compare various latest statistical tools.
19PC313B ECC II Advertising and sales promotion	On completion of the course, students should be able to ❖ Extensive understanding of Communication process and Advertising ❖ To Insight into Advertising Copy. ❖ To organize advertisement Campaign. ❖ To Evaluate Media Planning. ❖ To Discuss Legal aspect of selling.
19PC314 CCXI International Finance and Institutions	On completion of the course, students should be able to ❖ Understand various concepts of international finance and international financial institutions ❖ Insight into functioning of various types of exposures ❖ Utilise into functioning of forex rate determination theories ❖ Identify Balance of Payment ❖ Evaluate transaction Exposure ❖ Utilise into functioning of forex rate determination theories.
19PC315A ECC III Corporate Reporting Practices	On completion of the course, students should be able to ❖ acquaint with the knowledge of recent changes in financial accounting and reporting practices ❖ Demonstrate accounting polices

19PC315B ECC III Consumer Behaviour	On completion of the course, students should be able to ❖ Understand of consumer behaviour ❖ Insight determinants of marketing decision ❖ Identify group behaviour ❖ Evaluate Models of consumer behaviour ❖ Discuss Consumer research.
19PC416 CC XII Agricultural and Rural marketing	On completion of the course, students should be able to ❖ enlighten the knowledge about rural marketing. ❖ create expert knowledge on rural consumer behavior. ❖ Evaluate Segmentation and Targeting of rural market. ❖ analyze export potential for rural market. ❖ evaluate demand for agricultural products around the world
19PC417 CC XIII Corporate Ethics	On completion of the course, students should be able to ❖ To promote understanding of importance, for business and the community of ethical conduct. ❖ To provide the skills with which to recognize and resolve ethical issues in business. ❖ To enhance awareness and critical self-examination of one's own values. ❖ To evaluate the relevance of personal values in the business and in workplace. setting ❖ To analyze ethical issues in marketing. ❖ To plan ethical issues in finance.
19PC418 CC XIV Human Resources Management	On completion of the course, students should be able to ❖ Identify Role and functions of Human Resources management. ❖ To Compare Human Resources Management and Personnel management. ❖ To analyze man power planning. ❖ To evaluate various training programmes. ❖ To discuss various compensation Packages available. ❖ To predict health, safety and security of workers.
19PC419A ECC IV E-Commerce Lab	On completion of the course, students should be able to ❖ provide exposure to the students about information technology, networks and internet. ❖ provide them with the fundamental knowledge of the use of computers in business. ❖ analyse the concepts of e- commerce. ❖ identify the methodology for on line business dealing, using e-commerce infrastructure.
19PC419B ECC IV Training and Development	On completion of the course, students should be able to ❖ To familiarize basic concepts and principles of training and Development ❖ To evaluate training and learning needs ❖ To Identify Training needs and Assessment ❖ To Discuss Training criteria ❖ To Evaluate Emerging pattern in training and development

B.Com (COMPUTER APPLICATIONS) PROGRAMME

(COURSE STRUCTURE UNDER CBCS for the year 2019-2020 Onwards)

SEM	SUB CODE	TITLE OF COURSE	INS. HOURS	CREDITS	CIA	EXT	TOT
I	19T101	LC-I-Tamil	6	3	25	75	100
	19H101	ELC-I-English	6	3	25	75	100
	19CA101	CC-I-Introduction to Accountancy	6	5	25	75	100
	19CA102	CC-II – Marketing	5	5	25	75	100
	19CA103A	AC-I- Fundamentals of computer Applications	5	3	25	75	100
	19VED	Value Education	2	2	25	75	100
		TOTAL	**30**	**21**	**-**	**-**	**600**
II	19T202	LC-II-Tamil	6	3	25	75	100
	19H202	ELC-II-English	6	3	25	75	100
	19CA203	CC-III- Business Tools for Decision Making	5	3	25	75	100
	19CA202A	AC-II- Data Base Management Systems (Theory – I)	5	5	25	75	100
	19CA203AL	AC-III- RDBMS Lab	4	3	40	60	100
	19XCA21	SKBC-I-Office Management	2	2	25	75	100
	19EVS	EVS – Environmental Studies	2	2	25	75	100
		TOTAL	**30**	**21**	**-**	**-**	**700**
III	19T303	LC-III-Tamil	6	3	25	75	100
	19H303	ELC-III English	6	3	25	75	100
	19CA307	CC-IV- Business Accounting	6	5	25	75	100
	19CA3089	CC-V- Business Communication	5	5	25	75	100
	19CA304AL	AC-IV- PC Package (Practical)	4	3	40	60	100
	19XCA32	SKBC-II- Stock Exchange Practices	2	2	25	75	100
	19GS	Gender Studies	--	1	-	100	100
		TOTAL	**29**	**22**	**-**	**-**	**700**
IV	19T404	LC-IV Tamil	6	3	25	75	100
	19H404	ELC-IV English	6	3	25	75	100
	19CA410	CC-VI- Cost Accounting	5	5	25	75	100
	19CA411	CC-VII-Business Management	5	4	25	75	100
	19CA405A	AC-V- Web Programming	4	4	25	75	100
	19CA406AL	AC-VI- Web Development Lab	3	2	40	60	100
	19CA4N	NMEC1-Prinicipes of Banking	2	2	25	75	100
	19SSC	SSC-Soft Skills	---	2	-	100	100
		TOTAL	**31**	**25**	**-**	**-**	**800**

	19CA513	CC-VIII- Corporate Accounting	6	5	25	75	100
	19CA514	CC-IX-Entrepreneurial Development	6	5	25	75	100
	19CA515L	CC-X-Fundamentals of Computerized Accounting (practical)	6	5	40	60	100
V	19CA516	CC-XI- Python Programming	5	4	25	75	100
	19CA517(a) 19CA517(b)	**EC-I-(a)Business Law(Or) (b)Auditing	5	4	25	75	100
	19CA5N	NMEC II– Principles of Human Resource Management	2	2	25	75	100
		TOTAL	**30**	**25**	**-**	**-**	**600**
	19CA618	CC-XII- Management Accounting	5	4	25	75	100
	19CA619	CC-XIII- Income Tax Law and Practice	5	5	25	75	100
	19CA620L	CC-XIV- Advanced Computerized Accounting (Practical)	5	4	40	60	100
VI	19CA621	CC-XV- Banking Theory Law and Practice	5	4	25	75	100
	19CA622(a) 19CA622(b)	**EC-II-(a)E-Commerce **(Or)** (b)Management Information System	5	4	25	75	100
	19CA623(a)L 19CA623(b)	**EC-III-(a)Commerce Practical**(Or)** (b)Human Resource Management	5	4	40 25	60 75	100
	19EA	EA- Extension Activities	-	1	-	-	-
		TOTAL	**30**	**26**	**--**	**-**	**600**
		TOTAL	**180**	**140**			**4000**
	19CAC	Comprehensive Course	--	4	--	--	100
	19XCA33	SKBC- III (Self Study)	--	2	--	--	100
		GRAND TOTAL	**180**	**146**	**--**	**--**	**4200**

Programme Educational Objectives(PEO)

The graduates will be able to:

PEO-1: Possess competent skills in micro areas like Accounting, Taxation, Companies, Banking, Insurance and E-Commerce.

PEO-2: Develop a programme for system based Applications and Web page creation for business enterprises.

PEO-3: Pursue research in their chosen field of Commerce and Computer Applications

PEO-4: Modeling, Designing, implementing and verifying a computing system, and to meet specified requirements while considering real-world constraints.

PEO-5: Find solutions to the real time problems of business with the specialized knowledge developed through practical training.

PEO-6: Demonstrate team spirit, Enriched communication and Intellectual skills and values continue to learn and adapt to change throughout their career.

Program Outcome (PO)

At the end of the programme, graduates will be able to:

PO-1: Gain knowledgeable in the in the field of Commerce and computer application in business and apply the principles of the same to the needs of the employer / institution / enterprise/ society.

PO-2: Acquiring skills in the field of Commerce and Computer applications.

PO-3: Identify with appreciate Professional ethics and social, legal aspects of Commerce.

PO-4: Demonstrate a fundamental comprehension of business opportunity, evaluation from the Perspective of a Prospective Investor.

PO-5: Identify the most recognized sources of potential fund and Financing business start-ups or expansion.

PO-6: Integrate the ethical behavior in self learning, apply towards lifelong learning and acquiring knowledge in modern corporate and IT sector.

Programme Specific Outcome (PSO)

The graduates will be able to:

PSO - 1: Apply the knowledge of Commerce and its Applications in the domain of Trade, Company and Financial Institutions and IT sector.

PSO- 2: Solve the complex problems in the field of business and software with an understanding of the Societal, Legal and Cultural impacts of the solution.

PSO-3: Demonstrate progressive learning of various tax issues and tax forms related to individuals and others.

PSO-4: Recognize features and roles of Businessmen, Entrepreneur, Managers, Consultant, which will help to possess knowledge and other soft skills.

PSO-5: Acquire practical skills to work as Tax consultant, Audit assistant, and other supporting services.

PSO-6: Apply both quantitative and qualitative knowledge to their future careers in business.

19CA101- CC-I-INTRODUCTION TO ACCOUNTANCY	On completion of the course, students should be able to: CO-1: Exhibit the knowledge of the accounting and book-keeping. CO-2: Acquire the skill to prepare the final accounts for business concerns. CO-3: Apply the accounting rules in determining financial results of Non- profit organization. CO-4: Prepare total debtors and creditors system of financial statements. CO-5: Connect knowledge and record business assets change that are envisaged.
19CA102-CC-II-MARKETING	On completion of the course, students should be able: CO-1: Formulate a marketing plan including marketing objectives, marketing mix and strategies. CO-2: Determine strategies for developing new products and services that are consistent with evolving market needs. CO-3: Develop pricing strategies that take into account perceived value, competitive pressures corporate objectives and efficient distribution of product and services. CO-4: Integrate the principles of business ethics and corporate social responsibility. CO-5: Utilize digital tools to analyze the effectiveness of a marketing campaign.
19CA103A-AC–I-FUNDAMENTALS OF COMPUTER APPLICATIONS	On completion of the course, students should be able to: CO-1: Describe the components and generations of computers. CO-2: Illustrate different types of software and its usage. CO-3: Design flow charts for simple applications. CO-4: Utilize number system to convert one form of data into other form. CO-5: Apply flip flop concepts and create counters & register circuit.
19CA203 - CC III – BUSINESS TOOLS FOR DECISION MAKING	On completion of the course, students should be able to: CO-1: Enlighten the statistics concepts correlation and regression analysis, time series analysis. CO-2: Analyze independently the statistical parameters (Mean, Measures of Dispersion, Correlation Co-efficient, and Indexes) CO-3: Understand the meaning of the calculated statistical indicators. CO-4: Decide a statistical method for solving practical problems. CO-5: Analyze cost of living index and family budget method.

19CA202A - AC-II- Data Base Management Systems (Theory – I)	**On completion of the course, students should be able to:** **CO-1:** Understand the fundamentals of database system **CO-2:** Describe various data models **CO-3**: Design and create tables in database and execute queries **CO-4**: Design a database based on a data models using normalization **CO-5**: Apply Queries to extract information from database
19CA203AL – AC-III – RDBMS LAB	**On completion of the course, students should be able to:** **CO1:** Create and manipulate table of information and analyze various commands. **CO2:** Apply the commands and generate reports. **CO3:** Write sub queries, joins and views for the real time problem and provide solutions.
19XCA21 - SKBC–I– OFFICE MANAGEMENT	**On completion of the course, students should be able to:** **CO-1:** Incorporate and Match the type of communication with the appropriate method. **CO-2:** Demonstrate improving telephone skills and developing filing systems, using electronic filing systems. **CO-3:** Understand the various administrative systems required by an organization through an effective filing system. **CO-4:** Handle office documents and a diary with appropriate confidentiality. **CO-5:** Implementing control measures with individuals when needed to manage documents efficiently.
19CA307-CC-IV-BUSINESS ACCOUNTING	**On completion of the course, students should be able to:** **CO-1:** Familiarize the concept of Branch and departmental accounts. **CO-2:** Enable to understand the concept of partnership accounts admission. **CO-3:** Understand the concept of retirement and death of the partner. **CO-4:** Familiarize the dissolution of partnership firm and its procedures. **CO-5:** Introduce the system of Insurance claims and different kinds of policies.

19CA308-CC-V-BUSINESS COMMUNICATION	**On completion of the course, students should be able to:** **CO-1:** Apply business communication strategies and principles to prepare effective communication for domestic and international business situations. **CO-2:** Identify ethical, legal, cultural, and global issues affecting business communication. **CO-3:** Utilize analytical and problem solving skills appropriate to business communication. **CO-4:** Compose and revise accurate business documents using computer technology, via electronic mail, Internet, and other technologies. **CO-5:** Deliver an effective oral business presentation.

19CA304AL-AC-IV-PC PACKAGE (PRACTICAL)	**On completion of the course, students should be able to:** **CO1:** apply various facilities in MS Word and create different documents. **CO2**: analyze**,** design and develop applications using MS Excel. **CO3:** create presentations on any given topic using MS Power point.
19XCA32-SKBC-II-STOCK EXCHANGE PRACTICES	**On completion of the course, students should be able to:** **CO-1:** Understand the depth knowledge of Indian Financial system. **CO-2:** Evaluate investment advice from Stock players. **CO-3:** Comprehend the functions of stock practices in India. **CO-4:** Grasp the different types of exchanges practices in India. **CO-5:** Identify and interpret business cycle phases and their relationship to short- and long- term capital market returns in stock exchange practices.
19CA410-CC-VI-COST ACCOUNTING	**On completion of the course, students should be able to:** **CO-1:** Understand basic concepts of cost accounting and how to prepare cost sheet. **CO-2:** Explicate the methods of pricing issues and stocks - compute and explain the stock control levels **CO-3:** Computelabour cost using the various methods of remuneration and incentives schemes. **CO-4:** Study the overheads analysis and explain how to allocate and apportion overheads to cost centre. **CO-5:** Describe the valuation process methods of apportioning joint costs to joint-products.
19CA411-CC-VII-BUSINESS MANAGEMENT	**On completion of the course, students should be able to:** **CO-1:** Know the basic concepts, principles and theories of management. **CO-2:** Enrich the goals of organizational planning outcomes, and apply in practice in various situations. **CO-3:** Aware of the concepts, theories and process of organizing. **CO-4:** Learn how to managing people at work effectively with within an organization. **CO-5:** Enhance the leadership styles, qualities and integrates concepts across disciplines.
19CA405A-AC-V-WEB PROGRAMMING	**On completion of the course, students should be able to:** **CO1:** Analyze the HTML elements and design a static web page using HTML. **CO2:** Enlighten the concepts of VB Script and validate the HTML form data using VBScript. **CO3:** Apply the concepts of PHP to write simple server side scripts **CO4:** Illustrate with the database from PHP. **CO5:** Design and develop interactive web page using WAMP.

19CA406AL-AC-VI-WEB DEVELOPMENT LAB	**On completion of the course, students should be able to:** **CO1:** Analyze HTML to create static web pages. **CO2**: Apply PHP and MYSQL to create server side scripts. **CO3**: Create interactive web pages using WAMP.
19CA4N-NMEC-I-PRINCIPLES OF BANKING	**On completion of the course, students should be able to:** **CO-1:** Able to Know the functions and services of commercial banks. **CO-2:** Understand the various products and services offered by the bank. **CO-3:** Identify the different types of customers in banking sectors. **CO-4:** Apply the regulatory issue that arises in banking sector. **CO-5:** Use different kinds of Online Banking services and identify the latest Digital Banking practices.
19CA513-CC-VIII-CORPORATE ACCOUNTING	**On completion of the course, students should be able to:** **CO-1:** Understand exact exposure of share capital, **CO-2:** Identify the main features of a company accounts. **CO-3:** Understand about goodwill and share its adjustments in the books of a company business. **CO-4:** Understanding the Amalgamation, Absorption, Internal l Construction of Companies. **CO-5:** Demonstrate the Holding and Subsidiary Companies.
19CA514-CC-IX-ENTREPRENEURIAL DEVELOPMENT	**On completion of the course, students should be able to:** **CO-1:** Acquire the skills of Entrepreneurship including women. **CO-2:** Discover the ideas through EDP. **CO-3:** Apply the business idea to prepare project proposal **CO-4:** Assess the effectiveness of different entrepreneurial strategies, and effectiveness of SSI units. **CO-5:** Enlighten the importance of financial assistance and services to entrepreneur
15CA515L-CC-X-FUNDAMENTALS OF COMPUTERIZED ACCOUNTING(PRACTICAL)	**On completion of the course, students should be able to:** **CO-1:** Understand the basic concepts accounting and its principles. **CO-2:** Generate trial balance, final accounts and statement of Bank Reconciliation Statement in Tally. **CO-3:** Prepare creation stock groups, stock categories, stock items and inventory report. **CO-4:** Generate cost centre, Cost Category Report, Budgets reports and Payroll Reports. **CO-5:** Display the bills wise details, price list and point of sale.

15CA516-CC-XI-PYTHON PROGRAMMING	**On completion of the course, students should be able to:** **CO1:** Understand the basics and control flow structures of python language. **CO2:** Recognize the functions, user defined and built-in-modules in python. **CO3:** Exhibit the data structure concepts and its problem solving in python. **CO4:** Apply files and exception handling concepts in python to develop scripts. **CO5:** Analyze the object oriented programming concepts in python.
15CA517(a)-EC-I-BUSINESS LAW	**On completion of the course, students should be able to:** **CO-1:** Understand the relevance of business law to individuals and businesses and the role of law in an economic, political and social context **CO-2:** Identify the fundamental legal principles behind contractual agreements. **CO-3:** Acquire the skills Indemnity, Guarantee, Bailment, Pledge and Agency. **CO-4:** Exhibit the skills various Trade Laws of Land - with an expert knowledge of Indian Contract Act, Sale of Goods Act. **CO-5:** Know the different negotiable instruments such as bill of exchange, Cheque , promissory notes.
15CA517(b)- EC-I-AUDITING	**On Completion of the course, students should be able to:** **CO-1:** Demonstrate the different types of audit. **CO-2:** Identify all stages of audit programs and planning. **CO-3:** Apply all the standard audit procedures for internal control. **CO-4:** Examine how to prepare company audit reports. **CO-5:** Ascertain the all types of audit.
19CA5N - NMEC – PRINCIPLES OF HU RESOURCE MANAG	**On Completion of the course, students should be able to:** **CO-1:** Acquire the skills of HRM and HRD **CO-2:** Identify the process and sources of recruitment. **CO-3:** Know the procedure to selection of employees in an organization. **CO-4:** Analyze the techniques to evaluate the training programs using appropriate design. **CO-5:** Evaluate employees to perform a job in an organization.
19CA618-CC – XII – MANAGEMENT ACCOUNTING	**On completion of the course, students should be able to:** **CO-1:** Acquire the knowledge of management accounting and its statements. **CO-2:** Know the changes in financial position of Fund flow Statement and Cash flow Statement. **CO-3:** Identify the Break-Even Analysis and its applications. **CO-4:** Evaluate the techniques for budgeting methods. **CO-5:** Analyze the techniques of capital budgeting system.

19CA619 - CC – XIII – INCOME TAX LAW AND PRACTICE	**On completion of the course, students should be able to** **CO-1:** Illustrate the provisions in the corporate tax laws can be used for tax planning. **CO-2:** Know the different types of incomes and their taxability and expenses and their deductibility. **CO-3:** Compute the self occupational house and Let out house. **CO-4:** Acquaint the various deductions to compute the income under the head business or profession. **CO-5:** Learn the Short term and Long term gain and Income from other sources.
19CA620L - CC – XIV – ADVANCED COMPUTERIZED ACCOUNTING (PRACTICAL)	**On completion of the course, students should be able to:** **CO-1:** Know the concept of CGST, SGST, IGST, and UGST. **CO-2:** Acquire an idea on the policy and legislative scheme of India's Goods and service tax. **CO-3:** Understand the exception limit of GST to the nation. **CO-4:** Acquire the skills of tax liability. **CO-5:** Gain the knowledge to registration of GST.
19CA621-CC – XV – BANKING THEORY LAW AND PRACTICE	**On completion of the course, students should be able to:** **CO-1:** Understand the commercial banking system, structure nationalization, and types of deposits and lending. **CO-2:** Know the procedural formalities in dealing with different types of customers. **CO-3:** Acquire the concepts of Negotiable Instruments like Bill of Exchange, Cheque and Promissory Note. **CO-4:** Know the statutory protection of Paying and Collecting Banker. **CO-5:** Understand the latest developments in banks such as, ATM, EFT, ECS, CTS and Internet Banking system.
19CA622(a) - EC– II – E-COMMERCE	**On completion of the course, students should be able to:** **CO1:** Recognize the components, framework and pros and cons of ecommerce. **CO2:** Understand EDI and VAN **CO3:** Analyze security issues in ecommerce. **CO4:** Understand consumer oriented ecommerce and applications. **CO5:** Describe various e-payment system and risks.

19CA622(b) - EC– II – MANAGEMENT INFORMATION SYSTEM	**On completion of the course, students should be able to:** **CO1:** Illustrate the components, features, growth and limitations of MIS. **CO2:** Understand System concepts and SDLC. **CO3:** Familiar with Management Information System in business management. **CO4:** Understand client server networks and functional management. **CO5**: Analyze functional management system with accounting, human resource management, marketing etc.
19CA623L(a) - EC-III- COMMERCE PRACTICAL	**On Completion of the Course Students Should be able:** **CO-1:** Build a strong foundation of knowledge in different areas of Commerce. **CO-2:** Demonstrate different challan filling in Banking and Stock market practices. **CO-3:** Exhibit Filling up of Jewel loan Application form, procedures for releasing of jewellery in jewel loan. **CO-4:** Write the agenda and minutes of their own and should not used printed formats in General body and Board of Directors Meeting. **CO-5:** Demonstrate Filling up of an application form of LIC, PAN , GST.
19CA623(b) - EC-III- HUMAN RESOURCE MANAGEMENT	**On completion of the course, students should be able to:** **CO-1:** Understand the basic concepts, functions and of HRM, HRIS. **CO-2:** Acquire the skill to prepare a plan for managing a people at work. **CO-3:** Identify the procedure to recruit and select the employees in an organization. **CO-4:** Select suitable methods of training to employees. **CO-5:** Know the techniques to evaluate the performance.

Department of BBA

Sem		Course	Title of the Course	Ins. Hrs	Credits	CIA	EXT	Total
I	I	LC-1	Language Course (Tamil)	6	3	25	75	100
	II	ELC-1	English Language Course	6	3	25	75	100
	III	CC-I	Core course	6	5	25	75	100
		CC-II	Core course	5	4	25	75	100
		AC-I	Allied course	5	4	25	75	100
	IV	VE	Value Education	2	2	25	75	100
Total Hours and Credits (Semester – I)				**30**	**21**	**150**	**450**	**600**
II	I	LC-II	Language Course (Tamil)	6	3	25	75	100
	II	ELC-II	English Language Course	6	3	25	75	100
	III	CC-III	Core course	5	4	25	75	100
		AC-II	Allied course	5	4	25	75	100
		AC-III	Allied course	4	3	25	75	100
	IV	SKBC-I	SKBC	2	2	25	75	100
		EVS	Environmental Studies	2	2	25	75	100
Total Hours and Credits (Semester – II)				**30**	**21**	**175**	**525**	**700**
III	I	LC-III	Language Course (Tamil)	6	3	25	75	100
	II	ELC-III	English Language Course	6	3	25	75	100
	III	CC-IV	Core course	5	5	25	75	100
		CC-V	Core course	6	5	25	75	100
		AC-IV	Allied course	5	4	25	75	100
	IV	SKBC-II	SKBC	2	2	25	75	100
		GS	Gender Studies	0	1	25	75	100
Total Hours and Credits (Semester – III)				**30**	**23**	**175**	**525**	**700**

Semester	Part	Course	Title of the Course	Ins. Hrs	Credits	CIA	EXT	Total Marks
IV	I	LC-IV	Language Course (Tamil)	6	3	25	75	100
	II	ELC-IV	English Language Course	6	3	25	75	100
	III	CC-VI	Core course(P)	5	3	25	75	100
		CC-VII	Core course	4	4	25	75	100
		AC-V	(department of mathematics)	3	2	25	75	100
		AC-VI	Allied course	4	4	25	75	100
	IV	NMEC-I	Non Major Elective	2	2	25	75	100
		SSC	Soft Skill Course	0	2	25	75	100
Total Hours and Credits (Semester – IV)				**30**	**23**	**200**	**600**	**800**
V	III	CC-VIII	Core course	6	5	25	75	100
		CC-IX	Core course	6	5	25	75	100
		CC-X	Core course	6	5	25	75	100
		CC-XI	Core course	5	4	25	75	100
		EC-I	Elective course	5	4	25	75	100
	IV	NMEC-II	Non Major Elective	2	2	25	75	100
Total Hours and Credits (Semester – V)				**30**	**25**	**150**	**450**	**600**
VI	III	CC-XII	Core course	6	5	25	75	100
		CC-XIII	Core course	6	5	25	75	100
		CC-XIV	Core course	5	4	25	75	100
		CC-XV	Core course	5	5	25	75	100
		EC-II	Elective Course	4	4	25	75	100
		EC-III	Elective course	4	3	25	75	100
	IV	EA	Extension Activities	0	1	--	--	--
				30	**27**	**150**	**450**	**600**
			TOTAL	**180**	**140**	**1000**	**3000**	**4000**
Extra Courses (Offered by College)								
		SKBC-III	SKBC (Self study)	-	2	--	100	100
		CC	Comprehension Course	-	4	--	100	100
GRAND TOTAL (for all semesters)				**180**	**146**			**4200**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO-1	**Subject profesiency : Equip with integrated knowledge in the area of marketing, finance, interprersonal management skills, entrepreneurship, stock market, managerial communication and leadership**
PEO-2	**Professional growth: make excellence in teaching, professional and involve in research activities through effective programmes**
PEO-3	**Cater the need of the industry & society: Gain experience in applying management techniques and decision making in various business activities with positive perspectives in future**
PEO-4	**Cater the needs of the Nation & global: Aware the use of computer application in business which connects our national economic development with global**

PROGRAMME OUTCOME (PO)

PO-1	**Acquire knowledge and skills in the field of management and apply such conceptual skills to cater the needs of employer and the society**
PO-2	**Gain analytical skills in the field of management**
PO-3	**Demonstrate and apply all learnt techniques in business or profession & practice ethics in all undertakings for the betterment of community living and nation building**
PO-4	**Manage and carry out the any business situation with the logic management principles even in real life issues**
PO-5	**Integrate management principles for the betterment of business or profession**
PO-6	**Apply various strategies in business to become successful entrepreneur**

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO-1	**Build strong foundation of knowledge in different areas of "management"**
PSO-2	**Integrate knowledge and skills that sustain effectiveness in all activities**
PSO-3	**Acquire knowledge regarding national and international business trends**
PSO-4	**Evaluate and classify various marketing strategies for the success of business which covers human resource, customers, cost benefits, investment decision making etc**
PSO-5	**Become creative thinker, good analyzer and problem solver**
PSO-6	**Explore how technology supports in managing business information**

Course Outcomes(Cos)

Name of the Course	Course Outcomes	
Principles of Accounting-CC-I	CO-1	Understand book keeping, accounting concepts, convention, preparing trial balance and cash book
	CO-2	Applying skills in preparing Final accounts with adjustments
	CO-3	Understand about the different methods of depreciation
	CO-4	Prepare BRS and Insurance claims
	CO -5	Differentiate ingle entry and double entry system
Principles of Management CC-II	CO-1	Understand the scope & nature of management process & levels of management
	CO-2	Learn to frame policy & take decisions in virtual settings. Know the types of planning and decisions.
	CO-3	Identify various types of organizations & span of control, delegation, authority & responsibility in departments
	CO - 4	Utilize the various sources of recruitment & selection. Know the training methods
	CO - 5	Practice control & co-ordination techniques for effective organizational function
Managerial Economics-AC-I	CO-1	Understand the scope & concepts of economics How economics relates with other field of studies and objectives of any firm
	CO-2	Understand and illustrate demand analysis Marginal utility & elasticity of demand
	CO-3	Understand and analyze the cost curves relating to output, variable proportion and return to scale
	CO-4	Understand and analyze the various methods and learn to fix price for different products
	CO -5	Know the classification of markets and levels of competitions
Marketing Management-CC-III	CO-1	Identify core concepts of marketing and the role of marketing in business and society
	CO-2	Develop marketing strategies based on product, price, place and promotion
	CO-3	Communicate unique marketing mixes and selling prepositions for specific product offerings
	CO-4	Apply knowledge and skills to real world experiences
	CO -5	Know the differences between various stages involve in marketing evolution

Business Mathematics and Statistics-AC-II	CO-1	Acquire the statistical concepts of matrix Algebra Transpose & properties, determinants of matrix
	CO-2	Understand and apply sets of numbers & diagram laws
	CO-3	Remember the classification and tabulation. Understand and apply frequency distribution, central tendency, mean, median and mode
	CO-4	Understand and apply correlation & regression
	CO -5	Analyze time series, least square, interpolation and extrapolation and binomial method
BUSINESS ENVIRONMENT AC - III	CO-1	Understand the scope & concepts of economics How economics relates with other field of studies and objectives of any firm
	CO-2	Understand and illustrate demand analysis Marginal utility & elasticity of demand
	CO-3	Understand and analyze the cost curves relating to output, variable proportion and return to scale
	CO-4	Understand and analyze the various methods and learn to fix price for different products
	CO -5	Know the classification of markets and levels of competitions
BANKING THEORY LAW AND PRACTICES (SKBC-I)	CO-1	Understand the classification of banks and role of RBI
	CO-2	Know the functions of commercial banks and the recent facilities provided by banks
	CO-3	Understand the types of accounts and deposits & redressal
	CO-4	Understand the types of borrowing and lending and precautionary steps taken by banks
	CO -5	Understand and demonstrate the various negotiable instruments
E-COMMERCE (SKBC-I)	CO-1	Understand the impact of internet on business
	CO-2	Understand apply web site for various communication
	CO-3	Analyze and apply online marketing
	CO-4	Understand and apply net banking
	CO -5	Understand intruder approaches and antivirus programs

BUSINESS COMMUNICATION-CC-IV	CO-1	Understand the scope of communication and know the importance of oral and written communication in business
	CO-2	Apply communication theories
	CO-3	Know the opportunities in the field of business communication under various situations
	CO-4	Use current technology used in general and business communication
	CO -5	Prepare different types of reports with an appropriate format, organization and language
COST ACCOUNTING-CC-V	CO-1	Apply skills in preparing cost sheet and understand tender and quotations
	CO-2	Understand the different levels of stock
	CO-3	Prepare various wage system
	CO-4	Understand about the different overhead calculation
	CO -5	Prepare and analyze production reports by using process costing system.
BUSINESS LEGISLATION-AC-IV	CO-1	Understand the contract and the elements needed for a valid contract and its types with cases
	CO-2	Understand how to perform the contract and discharge of and remedies for not fulfilling the contract
	CO-3	Know the rules relating to agency and partnership deed
	CO-4	Acquire the knowledge regarding consumer rights and settlement of grievances
	CO -5	Understand the rules relating to run a company
PERSONALITY DEVELOPMENT (SKBC-II)	CO-1	Apply various personality to find solutions for business problems
	CO-2	Evaluate the effects of verbal and non-verbal communication and apply suitable communication methods
	CO-3	Understand and evaluate different personalities which improves inter personal relationship
	CO-4	Evaluate the causes for stress and apply suitable solutions
	CO -5	Analyze various leadership and apply the suitable style according to situation in organization to achieve targets

SOFT SKILLS FOR MANAGERS (SKBC-II)	CO-1	Understand himself or herself to equip with job
	CO-2	Apply the techniques to motivate co-workers and maintain discipline in team work
	CO-3	Evaluate persons and situations then apply The techniques to bring co-operation
	CO-4	Apply methods to reduce self and others' stress in team work
	CO -5	Acquire, analyze and apply interview skills to evaluate employees for job
COMPUTER APPLICATION IN BUSINESS-CC-VI	CO-1	To understand about the usage of computer in business
	CO-2	To apply Microsoft office usage in business
	CO-3	To apply power point presentation in all business events as an attractive tool for easy understanding
	CO-4	To apply various accounting concepts in excel for easy and quick calculation for records
	CO -5	To apply tally for accounting purpose in enterprises
RETAIL MANAGEMENT CC-VII	CO-1	Know the concepts of retailing & retailing in India
	CO-2	Understand the types of retailing & its functions
	CO-3	Students are encouraged to do small retail sales with their own capital
	CO-4	Understand the factors determining retail shops Know the importance of branding, packaging & labeling
	CO -5	Evaluate various sales promotion activities like window display, advertisement, offer etc & could analyze challenges in retailing
		Apply various technology in retailing business
ORGANIZATIONAL BEHAVIOUR-AC-VI	CO-1	Define, explain and illustrate a range of organizational behaviour of individuals and groups
	CO-2	Analyze the behaviour of individuals and groups in terms organizational models & theories
	CO-3	Identify different motivational theories and evaluate motivational strategies used in organizational settings
	CO-4	Evaluate and apply appropriateness of various leadership styles and conflict management strategies used in organizations
	CO -5	Understand the role of organizational culture & able to analyze how it affects work relationship

BANKING – NMEC-I	CO-1	Know the functions of commercial banks
	CO-2	Understand the types of accounts and deposits
	CO-3	Understand the various negotiable instruments
	CO-4	Know the facilities provided by the bank like ATM, debit and credit cards & online banking and mobile banking
	CO -5	Know and understand NEFT, RTGS and De-mat services
HUMAN RESOURCE DEVELOPMENT– NMEC-I	CO-1	Understands the role of a human resource manager
	CO-2	Frame HR planning in an organization
	CO-3	Apply the techniques to recruit right person for the right job in right number and at right time
	CO-4	Apply various types of training to improve the efficiency of employees
	CO -5	Find best ways to perform to get promotion And remain updated
HUMAN RESOURCE MANAGEMENT– CC-VIII	CO-1	Understand the role of HR manager.
	CO-2	Understand and apply man power planning and its methods even in virtual settings
	CO-3	Identify the sources of recruitment and selection process in virtual settings too
	CO-4	Know and evaluate the selection during interview and apply in virtual settings
	CO -5	Find the appropriate method of training, rules relating to transfer, promotion, dismissal etc in order to maximize the contribution of employees
PRODUCTION AND OPERATION MANAGEMENT– CC-IX	CO-1	Analyze the place to start business. Understand & evaluate the factors determine the plant location
	CO-2	Understand the various terms like time study, motion study, method study, normal time, standard time and capacity planning
	CO-3	Prepare aggregate planning and weekly & monthly planning
	CO-4	Identify the various types of plant maintenance and the importance of JIT & sigma
	CO -5	Understand the importance of inventory control, EOQ, ABC analysis & evaluation

MANAGEMENT ACCOUNTING– CC-X	CO-1	Understand objectives, apply management Accounting ideas and practice in making decision making
	CO-2	Applying skills in preparing Financial statements and Ratio analysis
	CO-3	Understand about the preparation of Funds Flow Statements
	CO-4	Understand about the preparation of Funds Flow Statements
	CO -5	Know the difference between absorption costing and marginal costing
INTERNATIONAL BUSINESS– CC-XI	CO-1	Understand the term international trade, identify the mode to enter into global and its limitations
	CO-2	Understand the international business environment and system
	CO-3	Understand the economic integration and related bodies
	CO-4	Recognize FDI & IMF
	CO -5	Analyze international market and strategies with international HRM
ADVERTISING AND SALES PROMOTION – EC-I	CO-1	Understand and apply the concepts relating to advertisement
	CO-2	Measure the effectiveness of advertising mix
	CO-3	Apply ethics in advertising
	CO-4	Apply various sales promotional techniques in sales
	CO -5	Understand and evaluate the selling methods
TOTAL QUALITY MANAGEMENT – EC-I	CO-1	Understand the concepts of TQM
	CO-2	Measure the performance of himself in all tasks
	CO-3	Apply various methods of quality maintenance
	CO-4	Use various tools to enhance quality in management
	CO -5	Strive for getting quality certification

ENTREPRENEURSHIP DEVELOPMENT – NMEC-II	CO-1	Understand & Gain entrepreneur' qualities
	CO-2	Face challenges in job or business
	CO-3	Apply his knowledge in preparing and analyze the worth of project
	CO-4	Apply legal rules relating to business
	CO -5	Face risks in business
ORGANIZATIONAL BEHAVIOUR AND PSYCHOLOGY – NMEC-II	CO-1	Understand the importance of organizational behavior and apply it for better performance
	CO-2	Apply and analyzes various personality in organization and act according to
	CO-3	Engage on self motivation and improve their leadership qualities
	CO-4	Adapt various organizational culture for their survival
	CO -5	Control stress by following various techniques to contribute more to organization
TAXATION FOR MANAGERS CC-XII	CO-1	Understand & apply the basic concepts of taxation especially individual income
	CO-2	Calculate the tax and deductions under income from salary on self
	CO-3	Prepare tax sheets for income from house property by applying rules
	CO-4	Understand and calculate income from other sources of income
	CO -5	Apply the gained knowledge in submitting GST returns
FINANCIAL MANAGEMENT CC-XIII	CO-1	Apply the techniques to maximize profit in business
	CO-2	Apply the concepts of cost of capital
	CO-3	Understand the factors affecting cost of structure
	CO-4	Prepare capital budgets by analyzing various factors
	CO -5	Understand and analyze the factors affection financial plans

ENTREPRENEURIAL DEVELOPMENT CC-XIV	CO-1	Understand the basic development of entrepreneurship as a profession
	CO-2	Understand various business models Barriers to entrepreneurs (especially women entrepreneurs)
	CO-3	Write a business plan describing a new business venture
	CO-4	Know marketing strategies for small business & monitor the performance of a new firm
	CO -5	Understand how to prepare project for a business and appraisal of it Know the social responsibility of entrepreneurs
STRATEGIC MANAGEMENT CC-XV	CO-1	Understand the concept of strategy, mission, vision and objectives
	CO-2	Analyse the effectiveness of strategy through various analysis
	CO-3	Identify various alternate strategies & select appropriate strategy to improve business
	CO-4	Understand the process of formulating and implementing strategies
	CO -5	Understand and apply the control techniques to improve situation and analyze the case
INVESTMENT MANAGEMENT - EC-II	CO-1	Know the features of investment & capital market and its risks
	CO-2	Understand the role and functions of capital market & its reforms
	CO-3	Understand the role of stock exchange, listing & depository system' working
	CO-4	Know the objectives of NSE, OTCEI and guidelines of SEBI
	CO -5	Understand & could apply online stock trading & dematerialization
EXPORT MANAGEMENT – EC-II	CO-1	Understand the essentials of export
	CO-2	Carry on buying and selling of goods and services to other countries to expand business
	CO-3	Apply packaging techniques to attract foreign customers
	CO-4	Identify various documents relating to export and import
	CO -5	Avail government' incentives provided to export

INDUSTRIAL RELATION – EC-III	CO-1	Understand and remember the effectiveness of industrial relation
	CO-2	Make use of the power of trade union & utilizes his rights through trade union
	CO-3	Apply negotiating skills if required
	CO-4	Practice good relationship with co-workers
	CO -5	Take part in participative management
LOGISTICS AND SUPPLY CHAIN MANAGEMENT –EC-III	CO-1	Understand the importance of logistics in business
	CO-2	Understand and follow the functions of supply chain
	CO-3	Apply and maintain the effective transportation network to cater the needs of customers
	CO-4	Understand the success of business depends on good suppliers' relationship
	CO -5	Apply e-techniques to improve business

B.Sc BOTANY COURSE STRUCTURE UNDER CBCS PATTERN
(For the Candidates admitted from 2015 – 2016 Academic year onwards)

Sem	Course	Course Title	Hrs/ week	Credits	Exam hours	Marks		Total
						Int.	Ext.	
I	LC – I	Cheyyul (Ikkala ilakkiyam), Sirukathai, Payan Murai Tamizh, Tamizh ilakkia varalaru	6	3	3	25	75	100
	ELC – I	English for communicative competence	6	3	3	25	75	100
	CC-I	Plant Diversity I (Algae, Fungi, Lichens and Bryophytes)	6	5	3	25	75	100
	CC-II	Practical - I (Plant Diversity I & II)*	3	-	*	-	-	-
	AC –I	Zoology- Animal Structure and function	4	4	3	25	75	100
	AC –II	Zoology Practical*	3	-	*	-	-	-
	VE	Value Education	2	2	3	25	75	100
		Total	**30**	**17**		**-**	**-**	**500**
II	LC – II	Cheyyul (Pakthi, idaikkala ilakkiyam), Tamizh Semmozhi varalaru, Mozhipeyarppriyal, Tamilzh Ilakkiya varalaru	6	3	3	25	75	100
	ELC- II	English for Proficiency	6	3	3	25	75	100
	CC-II	Practical-I (Plant Diversity -I & II)*	3	4	3	40	60	100
	CC-III	Plant Diversity- II (Pteridophytes, Gymnosperms and Paleobotany)	4	4	3	25	75	100
	AC -II	Zoology Practical*	3	4	3	40	60	100
	AC- III	Zoology- Economic Entomology and Vermitechnology	4	4	3	25	75	100
	EVS	Environmental Science	2	2	3	25	75	100
	SKBC	Skill Based Course - I	2	2	3	25	75	100
		Total	**30**	**26**		**-**	**-**	**800**

III	LC -III	Cheyyul (Kappiyangal), Puthinam, Tamizh ilakkia varalaru	6	3	3	25	75	100
	ELC–III	English for Employability	6	3	3	25	75	100
	CC -IV	Microbiology and Plant Pathology	5	5	3	25	75	100
	CC -V	Practical –II (Microbiology and Plant Pathology & Cytology and Genetics)*	3	-	*	-	-	-
	AC -IV	Chemistry- I	5	4	3	25	75	100
	AC - V	Chemistry Practical*	3	-	*	-	-	-
	SKBC-II	Skill Based Course -II	2	2	3	25	75	100
	GS-	Gender Studies	0	1	3	-	100	100
		Total	**30**	**18**		-	-	**600**
IV	LC– IV	Cheyyul (Pazhantamizh illakkiyam), Nandakam, Tamizh ilakkia varalaru, Katturai Varaiviyal	6	3	3	25	75	100
	ELC– IV	English for wisdom and experience	6	3	3	25	75	100
	CC –V	Practical –II (Microbiology and Plant Pathology& Cytology and Genetics)*	3	4	3	40	60	100
	CC- VI	Cytology and Genetics	5	5	3	25	75	100
	AC – V	Chemistry Practical*	3	4	3	40	60	100
	AC –VI	Chemistry –II	5	4	3	25	75	100
	NMEC - I	Candidate has to choose any one of the course offered by the Department/ Other Departments	2	2	3	25	75	100
	SSC	Soft Skills Course	0	2		-	100	100
		Total	**30**	**27**		**-**	**-**	**800**
V	CC– VII	Plant Anatomy and Embryology	6	5	3	25	75	100
	CC – VIII	Plant Systematics and Economic Botany	6	5	3	25	75	100
	CC – IX	Biochemistry and Biophysics	5	4	3	25	75	100
	CC – X	Practical –III (Plant Anatomy and Embryology & Plant Systematic and Economic Botany & Biochemistry and Biophysics	6	5	3	40	60	100
	EC-I	Candidate has to choose any one of the course from GROUP-I	5	5	3	25	75	100
	NMEC - II	Candidate has to choose any one of the course offered by the Department/ Other Departments	2	2	3	25	75	100
		Total	**30**	**26**		**-**	**-**	**600**

VI	CC – XI	Plant Physiology	6	5	3	25	75	100
	CC– XII	Plant Biotechnology	6	5	3	25	75	100
	CC – XIII	Practical –IV (Plant Physiology & Plant biotechnology)	6	5	3	40	60	100
	EC - II	Candidate has to choose any one of the course from GROUP-II	6	5	3	25	75	100
	EC –III	Candidate has to choose any one of the course from GROUP-III	6	5	3	25	75	100
	EA-	EA-Extension Activities	-	1		-	-	-
		Total	**30**	**26**			**-**	**500**
		Over all Total	**180**	**140**		**-**	**-**	**38000**
SELF STUDY COURSES								
		Comprehensive course	0	4	3	-	100	100
	SKBC - III	SKBC - III	0	2	3	-	100	100
		Over all Total (including self study)	**180**	**146**				**4000**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The graduate will be able to:

PEO 1 Graduates of the program will develop a strong and competent knowledge in basic Plant science required for critical learning and research.

PEO 2 Graduate students will develop diversified basic professional skills through various laboratory technical training, communication and presentation skills.

PEO 3 They will possess an ability to identify, formulate, and solve Plant problems to contribute to service efforts to community in both the professional and private realm.

PEO 4 Students familiar in classical botany related topics of course such as levels of plant organization, Taxonomy, anatomy, embryology, physiology, ecology for successful career.

PEO 5 Gradates will integrate related topics from separate parts of the course such as, Techniques, Cell biology, Biochemistry, genetics, Basic biotechnology, molecular biology,

PEO 6: To motivate the student in self-employment through bio-fertilizer preparation.

PROGRAMME OUTCOME (PO)

PO 1 Fundamental and core knowledge & understanding of plant sciences

PO 2 Relevant knowledge of core concepts, principles, themes, terminology, and classification systems in the terrestrial biology disciplines covered in botany

PO 3 Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

PO 4 Scientific explanation for the unity and diversity of life on earth using copious examples

PO 5 Quantitative, qualitative analysis and interpretation of biological data.

PO 6 An ability to function effectively on teams and individually to accomplish a common goal

Program-Specific Outcomes (PSOs)

PSO 1: Achieve knowledge of pure and applied botany.

PSO 2 Ability to use knowledge imbibed for solving biological problems locally and globally.

PSO 3. Inculcate strong fundamentals on modern and classical aspects of Botany.

PSO4. Build life skills in Edible mushroom cultivation, Biofertilizer production, Greenhouse maintenance and Seed technology through value-added courses.

PSO 5. Create platform for higher studies in Botany.

PSO 6. Facilitate students to take-up successful career in Botany.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
PLANT DIVERSITY –I (ALGAE, FUNGI, LICHENS AND BRYOPHYTES)	1. Recognize the lower group of plants. 2. Explain the diversity and complexity of plant kingdom 3. Realize the significance of lower group of plants. 4. Understand the importance of algae 5. Familiar in importance of bryophytes
PLANT DIVERSITY-I & II	1. Create and manipulate table of information Familiarize with the external and internal structure of lower group organism 2. Learn the microscopic technique 3. Learn the survey techniques for evaluating the values of medicinal plants 4. Know about the cellular drawing 5. Gain knowledge on plant pathological diseases
PLANT DIVERSITY-II (PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY	1. Distinguish the first vascular plants and first flowering plants 2. Describe their diversity and complexity 3. Realize their significance of gymnosperm 4. Familier in economic importance of Gymnosperms 5. To know the significance of fossils and geological time scale
BIOFERTILIZERS AND ORGANIC FARMING	1. Isolate, identify and mass multiply biofertilizers 2. Explain the benefits of organic farming 3. Learn the characteristics, identification, cultural methods and maintenance of Azospirillum, Azotobacter, Azolla and Anabaena. 4. Understand the application of AM 5. Familiar in vermicompost making
MICROBIOLOGY AND PLANT PATHOLOGY	1. Explain the classification, nutrition and growth of microbes. 2. Perform the basic techniques in microbial culture production 3. Identify the plant diseases and try to practice the control measures for such diseases 4. Gain knowledge on Host parasite interaction process 5. Gain Knowledge in plant diseases.
MICROBIOLOGY AND PLANT PATHOLOGY & CYTOLOGY AND GENETICS	1. Be able to identify appropriate laboratory procedures for the detection and identification of organisms 2. Basic laboratory skills for the detection and identification of organisms Work effectively as an individual or part of a team 3. Familiar in to identify the various stages during cell division 4. Skilled in problem solving in genetics 5. Students can identify the disease

MUSHROOM TECHNOLOGY	1. Cultivate mushroom cultivation. 2. Explain the nutritive and medicinal value of mushrooms. 3. Depict the common cultivation methods for mushrooms. 4. Provide knowledge on layout for mushroom cultivation 5. Through knowledge on diseases in mushroom
CYTOLOGY AND GENETICS	1. To explain the structure of Cell components and their functions. 2. To have knowledge of the nature and function of genes, processes of inheritance . 3. To describe linkage, crossing over and mutations. 4. Gained knowledge on linkage techniques. 5. Through knowledge with DNA and RNA
HORTICULTURE	1. Demonstrate knowledge and understanding in Current applications of horticultural principles practices in propagation, 2. Familiar in pest management, production, maintenance, and business practices. 3. Apply horticultural principles to the successful growth a 4. Provide knowledge on production of horticultural plants. 5. Demonstrate the knowledge, skills and attributes to be successful contributing members of the horticulture profession.
Food science and Nutrition	1. Recognize the main world food problems and their root causes 2. Describe food components, with emphasis on proteins, carbohydrates and lipids 3. Describe food sensory, and discuss the main food quality attributes as perceived by the senses 4. Describe the principal causes of food deterioration; relate to practical examples 5. Through knowledge on concept of extension.
PLANT ANATOMY AND EMBRYOLOGY	1. To make connections between plant anatomy and the other major disciplines of biology 2. To identify and compare structural differences among different taxa of vascular plants. 3. Embryology gives information to student about the development of embryo to mature seed and original plants. 4. Through with fertilization in plants 5. Gained knowledge on polyembryony
PLANT SYSTEMATICS AND ECONOMIC BOTANY	1. Plant classification gives information about plant to classify in different families. 2. Understand the environments and basic concept of taxonomy, ecology. 3. Herbarium techniques give knowledge to help the identification of plants. **4.** Gained knowledge economic importance of plants**.** 5. Utilization of plants to enable the student about utility in life.

BIOCHEMISTRY AND BIOPHYSICS	1. Learn the Biochemical nature of cell. 2. Know the chemical nature of biomolecules. 3. Describe the structure and general features of enzymes 4. Apply the concept of enzyme activity and enzyme inhibition 5. Trained them on electrophoresis operation.
Plant Anatomy, Embryology, Plant Systematic And Economic Botany & Biochemistry and biophysics.	1. Familiar in plant systematics 2. Students can differentiate the anatomical structures of plant cells 3. They can identify the plants and the importance of it. 4. They can do biochemical estimations in plant samples. 5. Trained them operating instruments used in Biochemistry.
HORTICULTURE AND PLANT BREEDING	1. The breadth and depth of the profession of horticulture 2. Basic horticultural science terminology 3. Understand the developments in plant breeding 4. Understand the concepts of molecular breeding. 5. Through knowledge on crossing techniques.
MEDICINAL BOTANY	1. We able to demonstrate basic skills in herbal identification 2. Demonstrate harvesting and processing of plant materials 3. Be competent in the basic business skills necessary to build and maintain an herbal practice 4. Be able to collaborate with other healthcare providers in partnership 5. Skilled in medicinal preparation.
EDIBLE MUSHROOM CULTIVATION	1. To highlight the potential of these studies to become an entrepreneur 2. Knows the most important kinds of substrata for mushroom cultivation, belonging to the wastes of agricultural 3. To prepare media for the mushroom cultivation from these wastes; - 4. Can work with autoclaves; - can prepare microbiological media; 5. Familiar in mushroom cultivation.
GREEN HOUSE TECHNOLOGY	1. At the end of the course students should know identify the types and structures of existing greenhouse. 2. Learned about how to construct green house 3. In addition, students will learn the different systems for climate control in greenhouse and their management, cooling and heating systems. 4. Finally, students will be familiar with the techniques of light management 5. Students trained on disease and pest management.
PLANT PHYSIOLOGY	1. To understand plant physiological processes and metabolism. 2. To explain the role of micro nutrients in plant growth and development. 3. To relate photosynthesis with the formation of primary and secondary metabolites. 4. To clarify the mechanism and breaking of dormancy. 5. Familiarized on plant movements

PLANT BIOTECHNOLOGY	1. Concepts, tools and techniques related to in vitro propagation of plants. 2. Different methods used for genetic transformation of plants, use of Agro bacterium as a vector for plant transformation, components of a binary vector system. 3. Various case studies related to basic and applied research in plant sciences using transgenic technology. 4. Learn about bioreactors and their importance. 5. Familiar in molecular markers
PLANT PHYSIOLOGY AND PLANT BIOTECHNOLOGY	1. Got knowledge on mechanism of plant physiology. 2. Understand the fundamentals of Recombinant DNA Technology. 3. Know about the Genetic Engineering. 4. Trained in isolation of DNA 5. Understand the principle and basic protocols for Plant Tissue Culture.
PLANT ECOLOGY AND PHYTOGEOGRAPHY	1. To understand ecological relationships between organisms and their environment. 2. To identify diversity of life forms in an ecosystem. 3. Try to identify different ecological units found around your habitat and prepare a list of flora and fauna of that ecological system. 4. Familiar in impact and control measures of pollution 5. Got knowledge on phytogeography
FLORICULTURE	1. Relate the importance of the floriculture industry 2. Describe career opportunities in the floriculture industry 3. Explain the techniques in grading, bunching and shipping cut flowers in preparation for market 4. Knowledge on commercial floriculture. 5. Trained in floral arrangements.
BIOINFORMATICS AND BIOSTATISTICS	1. Students will learn necessary skills in the use of databases and online tools related to biological data. 2. Students will learn about the handling and analysis of databases using online tools. 3. Students will be trained in statistical concepts and principles relevant to biological data and their applications 4. Students trained on biostatistics 5. Students will learn about goodness of fit
SEED SCIENCE TECHNOLOGY	1. Student will have better understanding of seed physiology and vigour. 2. The course knowledge will create trained human resource for seed industry and research organizations. 3. Knowledge on current varieties of field crops, consultant services 4. Knowledge on seed production 5. To acquire knowledge on seed legislation and trading

NURSERY AND GARDENING	1. Provide the necessary technical plant science 2. Horticultural knowledge and skills to successfully operate a small horticulture business. 3. Prepare students for transfer to plant science / horticulture programs at institutions of higher learning 4. Basic and advanced plant science / horticultural skills development and improvement 5. Make the students familiar in marketing procedures.
ALLIED BOTANY - I	1. Explain the arrangement of leaves and inflorescences in the plant kingdom. 2. Construct floral diagram and floral formula for the selected plant species. 3. Predict the structural and functional details of cell organelles and their properties. 4. Demonstrate the Mendelian principles with cheker board. 5. Illustrate the elements of conducting system in plants.
ALLIED BOTANY - II	1. Describe the structure and reproduction methods of algae. 2. Demonstrate the methods of reproduction and life cycle of fungi. 3. Classify the bacteria and viruses based on their structure. 4. Compare and contrast the structure and methods of reproduction of Funaria, Lycopodium and Cycas. 5. Explain the concept of absorption of water and salts.
ALLIED PRACTICAL I & II	1. Create and manipulate table of information Familiarize with the external and internal structure of lower group organism 2. Learn the microscopic technique 3. Learn the survey techniques for evaluating the values of medicinal plants 4. Know about the cellular drawing 5. Gain knowledge on plant pathological diseases

B.Sc., Chemistry COURSE STRUCTURE UNDER CBCS PATTERN

Sem		Course Code	Title of the Course	H/W	Credit	Internal	External	Total
I	Part-I		LC-I Language Course-I Tamil	6	3	25	75	100
	Part-II		ELC-I English Language Course-I	6	3	25	75	100
	Part-III		CC-I General Chemistry – I	5	4	25	75	100
			CC-II Volumetric Analysis Practical– I	3	-	-	-	-
			AC-I Mathematics – I	5	4	25	75	100
			AC-II Mathematics – II	5	4	25	75	100
	Part-IV		VE Value Education	2	2	25	75	100
				32	20			600
II	Part-I		LC-II Language Course-II Tamil	6	3	25	75	100
	Part-II		ELC-II English Language Course-II	6	3	25	75	100
	Part-III		CC-III General Chemistry – II	4	4	25	75	100
			CC-II Volumetric Analysis Practical-I	3	4	40	60	100
			AC-III Mathematics – III	5	4	25	75	100
	Part-IV		SKBC-I Material Chemistry and Nanotechnology	2	2	25	75	100
	Part-IV		EVS Environmental Studies	2	2	25	75	100
				28	22			700
III	Part-I		LC-III Language Course-III Tamil	6	3	25	75	100
	Part-II		ELC-III English Language Course-III	6	3	25	75	100
	Part-III		CC-IV General Chemistry – III	5	5	25	75	100
			CC-V Inorganic Microscale Qualitative Analysis – Practical II	3	-	-	-	-
			AC-IV Physics –I	5	4	25	75	100
			AC-V Practical-I	3	-	-	-	-
	Part-IV		SKBC-II Chemistry of consumer products	2	2	25	75	100
	Part-IV		Gender Studies	-	1	-	100	100
				30	18			600
	Part-I		LC-IV Language Course-IV Tamil	6	3	25	75	100
	Part-II		ELC-IV English Language Course-IV	6	3	25	75	100

IV	Part-III		CC-VI General Chemistry – IV	5	5	25	75	100
			CC-VII Inorganic Microscale Qualitative Analysis – Practical II	3	4	40	60	100
			AC-V Physics –Allied practical II	3	4	40	60	100
			AV-VI Allied Physics – II	5	4	25	75	100
	Part-IV		NMEC-I Agricultural Science	2	2	25	100	100
	Part-IV		SS Soft skill	-	2	25	75	100
				30	27			800
V	Part-III		CC-VIII Inorganic Chemistry – I	6	5	25	75	100
			CC-IX Organic Chemistry – I	6	5	25	75	100
			CC-X Physical chemistry – I	5	5	25	75	100
			CC-XI Gravimetric Analysis & Organic compound analysis	3	-	-	-	-
			CC-XII Physical chemistry experiment & Organic preparation – Lab	3	-	-	-	-
	Part-III		EC-I Analytical chemistry	5	5	25	75	100
	Part-IV		NMEC-II Dairy Chemistry	2	2	25	75	100
				30	22			500
VI	Part-III		CC-XIII Inorganic Chemistry – II	6	5	25	75	100
			CC-XIV Organic Chemistry – II	6	5	25	75	100
			CC-XI Gravimetric analysis & Organic compound analysis	3	5	40	60	100
			CC-XII Physical chemistry experiment & Organic preparation – Lab	3	5	40	60	100
			EC-II Electrochemistry and Molecular Spectroscopy	6	5	25	75	100
			EC-III Molecular Dynamics	6	5	25	75	100
	Part-IV	Extension Activities		-	1	-	-	100
				30	31			700
		Total		**180**	**140**			4000
	Part-IV		CC Comprehensive Course	-	4	-	-	100

Program Educational Objectives (PEO)

PEO1: The objectives of the undergraduate program in Chemistry offered by the Department of Chemistry are designed to the students will able to succeed in obtaining employment appropriate to their interest in chemistry

PEO 2: Education and will become productive and valued professional, Continue to develop professionally through life-long learning,

PEO 3: Higher education and other creative pursuit in their area of expertise or interest.

PEO 4: Exercise leadership qualities in a responsive, ethical and innovative manner.

Program Outcomes (PO)

PO 1: Become knowledge in the subject of chemistry and apply the principles of the same to the needs of Employer/Institution/Enterprise/Society.

PO 2: Gain Analytical skills in the field/area of Chemistry.

PO 3: Understand and appreciate professional ethics, community living and Nation Building initiatives.

PO 4: Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical chemistries.

PO 5: Students will be able to design and carry out scientific experiments as well as Accurately record and analyze the results of such experiments.

PO6: Students will be skilled in problems solving, critical thinking and analytical reasoning as applied to scientific problems.

Program Specific Outcomes (PSO)

PSO 1: Apply the knowledge of chemistry in the domain

PSO 2: Solve the complex problems in the field of chemistry with an understanding of the societal, legal and cultural impacts of the solution. Students will be able to demonstrate their knowledge of the fundamentals and technical concepts of chemistry.

PSO 3: Theory and knowledge: upon completion of the organic chemistry sequence, chemistry majors are able to recognize and apply principles of atomic and molecular
structure to predict chemical properties and chemical reactivity.

PSO 4: Laboratory skills: Upon completion of a degree, chemistry majors are able to employ critical thinking and scientific enquiry in the performance, design, interpretation and documentation of laboratory experiments.

PSO 5: Quantitative skills: Upon completion of chemistry degree are able to interpret and analyze quantitative data. The students are able to understand theoretical concepts of instruments that are most commonly used in most chemistry fields as well as interpret and use data generated in instrumental chemical analysis.

PO 6: Students will be able to explain why chemistry is an integral activity for addressing social, economic and environmental problems. Students will be able to prepare themselves for employment in industry, the professions, and government or to pursue graduate work toward such advanced degrees as the M.Sc., or Ph.D. in chemistry or related fields.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CC-1- General Chemistry-I	CO 1: Explain the shapes of orbital based on quantum number and the occupancy of electrons in various quantum levels. CO 2: Discuss the polarization: covalent bonds polarity and non-polarity, types of reactions and Molecular orbital Theory for various molecule. CO 3: Discuss the preparation and properties of alkanes and cyclo alkanes. CO 4: Explain the polarization effects and bond fissions. CO 5: Discuss the gaseous laws and properties.
CC-2*- VOLUMETRIC ANALYSIS	CO 1: The distinction between qualitative and quantitative chemical analysis. CO 2: The application of statistical methods for the evaluation of laboratory data. CO 3: Methods for calibration and sampling applied to quantitative analysis. CO 4: The performance of graphical analysis to analyses laboratory results. CO 5: To familiarize the complexometry titration.
CC-3- General Chemistry-II	CO1: Acquired knowledge about redox reactions, oxides, oxyacids, halogens and interhalogen compounds. CO2: Learnt thoroughly the preparation, physical, and chemical properties of alkenes, alkynes, and homocyclic aromatic hydrocarbons. CO3: Taught in the field of electrical and magnetic properties of molecules and also studied about the states of matter like liquid, colloids, gels and emulsion. CO 4: To get knowledge about dienes and their stability. CO 5: To familiarize about the colloids and their properties.
Skill Based Subject I - Material Chemistry and Nanotechnology	CO 1: Target knowledge and understanding CO 2:Theoretical and practical knowledge related to modern materials and nanotechnology. CO 3: To develop academic breadth and depth. CO 4: The necessary foundation for training in research. CO 5: The students should able to the skills needed to plan and carry out large scale projects logically and efficiently

CC-4 - GENERAL CHEMISTRY-III	CO 1: Acquired knowledge in the field of position and periodic properties of s-block elements both alkali and alkaline earth metals, diagonal relationship between Li and Mg. CO 2: Learnt extraction, physical, and chemical properties of selected p-block elements like B, C and N families. CO 3: Educated thoroughly both electrophilic and nucleophilic substitution reactions in aromatic hydrocarbons. CO 4: Students should be able to get knowledge in group theory. CO 5: To get knowledge in point group and their properties.
CC-5-Practical-II-Inorganic Micro Scale Qualitative Analysis	CO 1: Types of acid radicals and Basic radicals CO 2: To learn the procedure of radical analysis CO 3: Well trained to analyze simple acid radicals, basic radicals and interfering radicals. CO 4: Get skilled to separate inorganic mixture and identified as individual cations and anions through the experiments. CO 5: Ability to apply in industry
Skill Based Subject II – Chemistry of consumer products	CO 1: Manufacture of candle like household materials. CO 2: Soaps and detergents CO 3: To get knowledge in the manufacture of varnishes and paints CO 4: To acquire knowledge in shave lotion and formulation process. CO 5: To familiarize about the preparation of Hair shampoo in different methods.
CC-6 - GENERAL CHEMISTRY-IV	CO 1: Well educated in p-block elements like oxygen, halogen and noble gas families and get knowledge in inner – transition metals, hydroxyl derivatives. CO 2: Qualified in various types of catalysis and kinetics of the chemical reactions. CO 3: Students should able to know the different types of catalysis and their activity in industries CO 4: To familiarize about homogeneous and heterogeneous catalysis CO 5: To get knowledge about the applications of catalysis in industry

NMEC- I Agricultural Science	CO 1: Acquired knowledge in characteristics of agro ingredients like fertilizers, pesticides, fungicides etc. CO 2: Studied well in the properties of soil, soil formation and how to maintain soil for cultivation. CO 3: To know about soil analysis, get knowledge in required nutrients for soil and pest controlling management. CO 4: To familiarize the classification of pest and safety measurement of pest. CO 5: The students should be able to know about fungicides and herbicides.
CC-7- INORGAMIC CHEMISTRY-I	CO 1: Well qualified in basic and fundamental concepts in coordination chemistry, theories and complexation properties of transition metals. CO 2: The students should be able to understand transition elements and biological importance of transition metals. CO 3: To know about the Applications of coordination chemistry CO 4: The students should be able to Industrial importance of coordination chemistry CO 5: Acquire the knowledge of fuels
CC-8- ORGANIC CHEMISTRY-I	Co 1: Highly developed in three dimensional arrangements of molecules and their orientation towards various chemical constituents. CO 2: Learnt well in the field of optical isomers, geometrical isomers and their selective orientation in enzyme coordination. CO 3: Studied thoroughly the chemistry of carbonyl compounds such as aldehyde, ketone, acids and their derivatives. CO 4: Knowledge assimilated in heterocyclic compounds. CO 5: To familiarize about the polynuclear hydrocarbons.
CC-9- PHYSICAL CHEMISTRY-I	CO 1: State and apply the laws of thermodynamics CO 2: Perform calculations with ideal and real gases CO 3: Predict chemical equilibrium and spontaneity of reactions by using thermodynamic principles. CO 4: Define the phases of matter, describe phases changes and interpret or construct phase diagram Co 5: Define the application of steam distillation.

CC-10-PRACTICAL-III-GRAVIMETRIC AND ORGANIC ANALYSIS	CO 1: Defines the properties of precipitate and precipitating reagents CO 2: Uses the gravimetric calculations CO 3: Identifies the solubility by the systematic method CO 4: Evaluate the analytical data in terms of statistics CO 5: To get knowledge about the instrument UV and Soxhlet
CC-11-PHYSICAL CHEMISTRY EXPERIMENTS AND ORGAMIC PREPARATIONS	CO 1: The preparation for each experiment by studying lab handouts. CO 2: Safety requirements and lab skills to perform physic-chemical experiments CO 3: How to keep records of instruments, parameters and experimental observations. CO 4: Reporting of experimental results in a publication. CO 5: Key experimental techniques including potentiometer, UV – Vis spectroscopy.
ELECTIVE-I-ANALYTICAL CHEMISTRY	CO 1: Explain the theoretical principles and important applications of classical analytical methods within titrations and various techniques within the gravimetric and colorimetric methods. CO 2: Explain the theoretical principles of selected instrumental methods within electro analytical and spectrometric /spectrophotometric methods and main components in such analytical instruments. CO 3: Explain the theoretical principles of various separation techniques in chromatographic and various applications of chromatographic techniques. Understanding computer application for chemistry problems. CO 4: The students should be able to get computer knowledge CO 5: To familiarize computer applications in chemistry
NMEC – II-DAIRY CHEMISTRY	CO 1: Composition, structure or functional relationship and properties of milk, milk components and products. CO 2: Physical, chemical and biochemical changes that occur during processing storage and use of milk and milk components CO 3: Chemical, physical, functional and nutritional properties of milk components. CO 4: Objective measurements, analysis and isolation of milk components. CO 5: Experimental demonstration of chemical and physical reactions of milk components during typical processing conditions.

CC-12- INORGAMIC CHEMISTRY-II	CO 1: To get knowledge about the Nuclear stability. CO 2: The students should be able understand Nuclear reactions and its applications CO 3: students should be able get knowledge in metallic bonds. CO 4: Thought in reaction mechanism of metal complexes and organ metallic compounds such as metal carbonyls, metal alkyls and Ferrocene. CO 5: To familiarize applications of organ metallic compounds.
CC-13- ORGANIC CHEMISTRY-II	CO: 1 The students should be able to learn the preparation and reaction mechanism of nitro compounds, Aromatic amines and diazonium compounds. CO: 2 To familiarize the synthesis and reaction mechanism of amino acids, proteins and nucleic acids. CO: 3 To know about the reaction mechanism of phenols CO: 4 Students should be able to get knowledge about synthesis and reaction mechanism of carbohydrates, Terpenes, alkaloids and vitamins. CO: 5 To familiarize the reaction mechanism of various molecular rearrangements.
EC-II – ELECTROCHEMISTRY AND MOLECULAR SPECTROSCOPY	CO: 1 Students should be able to understand the molecular spectroscopy. CO: 2 To know about the principles and applications of microwave spectroscopy. CO: 3 To familiarize the conductance and electrolytes of the solutions. CO: 4 To know about the concentration cells and different types of electrodes. CO: 5 Students should be able to know the principles and applications of UV visible, Raman, IR, NMR and ESR spectroscopy.
ELECTIVE – II –MOLECULAR DYNAMICS	CO: 1 The students able to get knowledge in classical mechanics CO: 2 To get the better understanding in basic in basic principles of quantum mechanics CO: 3 Acquire the concept of statistical thermodynamics CO: 4 To gain knowledge about the photochemistry CO: 5 The students should be able to know about the principles of photochemical kinetics

AC4-ALLIED CHEMISTRY-I FOR PHYSICS	CO: 1 Students should be able to understand the storage and handling of chemicals CO: 2 To know about the basic principles of quantum numbers and electronic configuration of atoms CO: 3 To familiarize the coordination chemistry and various types of fuels and fertilizers. CO: 4 To know about the polar effects and preparation and properties of halogen containing compounds CO: 5 To get knowledge about the unit cell, elements of symmetry, phase rule, laws of photo chemistry and quantum yield.
AC-5-ALLIED CHEMISTRY PRACTICAL FOR PHYSICS, ZOOLOGY AND BOTONY	CO: 1 Students should be able know about the preparation of primary standard solutions. CO: 2 To understand about the estimation acid-base titrations, permanganometry titrations and EDTA titrations. CO: 3 Students should be known about the analysis of organic compounds CO: 4 To familiarize about the preparation of derivative test for respective functional groups. CO: 5 The students should be able to apply lab experience in the industry
AC6-ALLIED CHEMISTRY-II FOR PHYSICS	CO: 1 Students should be able to know about the nuclear chemistry, bonding in metals and preparation properties of compounds of Sulphur. CO: 2 To familiarize about the carbohydrates and amino acids CO: 3 To know about the synthesis and properties of synthetic polymers and heterocyclic compounds. CO: 4 To understand about the types of stereo isomerism. CO: 5 To familiarize about the rate of reaction and mechanism of the reaction
AC4-ALLIED CHEMISTRY-I FOR ZOOLOGY & BOTONY	CO: 1 Students should be able to principles of volumetric analysis and concentration unites of solutions. CO: 2 To know about the quantum numbers and filling of electrons in various energy levels. CO: 3 To familiarize about the IUPAC name of the organic compounds, different types of isomerism and preparation and properties hetero cyclic compounds. CO: 4 To know about the carbohydrates, amino acids and proteins. CO: 5 To familiarize about the surface chemistry and the preparation and properties of polymers.

AC6-ALLIED CHEMISTRY-II FOR ZOOLOGY & BOTONY	CO: 1 Students should be able to know about the bonding in molecules and molecular orbital's of molecules and ions CO: 2 To familiarize about the coordination chemistry and magnetic properties of matters CO: 3 To know about the nucleic acids, antibiotics and water chemistry CO: 4 To understand the colloids and theories of acid and bases. CO: 5 To know about the laws of photo chemistry and quantum yield.

PG COURSE STRUCTURE UNDER REVISED CBCS PATTERN (2015-2016 ONWARDS)
M.Sc., CHEMISTRY

SEM	Course	Subject Title	Subject Code	Hrs/ Week	Credit	Int	Ext	Total
I	CC-I	Inorganic Chemistry-I		6	4	25	75	100
	CC-II	Organic Chemistry-I		6	4	25	75	100
	CC-III	Physical Chemistry-I		6	4	25	75	100
	CC-IV	Organic Chemistry Practical-I		6	4	40	60	100
	CC-V	Physical Chemistry Practical- I		6	4	40	60	100
II	CC-VI	Inorganic Chemistry-II		5	4	25	75	100
	CC-VII	Organic Chemistry-II		5	4	25	75	100
	CC-VIII	Inorganic Chemistry Practical-I		5	4	40	60	100
	CC-IX	Physical chemistry Practical-II		5	4	40	60	100
	EC-I	Advanced Topics in Physical Chemistry		5	5	25	75	100
	OEC-I*	Green & Industrial Chemistry/Forensic Science		5	4	25	75	100
III	CC-X	Inorganic Chemistry-III		5	4	25	75	100
	CC-XI	Organic Chemistry-III		5	4	25	75	100
	CC-XII	Physical Chemistry-III		5	4	25	75	100
	CC-XIII	Inorganic Chemistry Practical-II		5	4	40	60	100
	CC-XIV	Organic Chemistry Practical-II		5	4	40	60	100
	EC-II	Instrumentation and Material Chemistry		5	5	25	75	100
IV	EC-III	Special Topics in Organic Chemistry		6	5	25	75	100
	EC-IV	Electro and Surface Chemistry		6	5	25	75	100
	PW	Project Work**		18	10	25	75	100
		Grand Total		**120**	**90**	**500**	**1500**	**2000**

PROGRAMME EDUCATIONAL OBJECTIVE (PEO):

PEO 1:Technical Proficiency:

- The program gives success in getting employment in different areas, such as government, public and private sectors.
-

PEO 2: Professional Growth:

- Display to a high level a symmetric and in depth knowledge of their chosen areas of chemistry discipline.
- Demonstrate the standard and specialized technical skills required to safely operate in a research environment related to the chosen specialism.
- Demonstrate and ability to take significant responsibility and work in a self-directed manner both along and in groups and be able to act in a wide variety of professional levels and context both within and outside the discipline.
- Develop learning skills that allow then to self-evaluate and take responsibility for self-directed for their study within or outside the discipline all in continuous professional development

PEO 3: Management Skills:

- Be aware of and be able to manipulate online recourses for the collections and collation of literatures
- Demonstrate ability in critically analyzing and communicating complex sets of data verbally and in written form and have the insight to be able to scrutinize and reflect on aspects of the discipline
- This program helps each individual in developing personality skills like time management, crisis management, stress management, interviews and working as a team and group.

Programme Outcome (PO):

PO: 1 Theory and knowledge upon completion of the general chemistry sequence, chemistry major snare able to recognize and apply the principles of atomic and molecular structure to predict chemical properties and chemical reactivity.

PO: 2 Laboratory skills, upon completion of a degree, chemistry majors are able to employ
critical thinking and scientific inquiry in the performance, design, interpretation and documentation of laboratory experiments, at a level suitable to succeed at an entry- level position in chemical industry or a chemistry graduate programme.

PO: 3 Quantitative skills; upon completion of a chemistry degree, chemistry majors are able to interpret and analyze quantitative data.

PO: 4 Students should be able to work in a chemical or related field.

PO: 5 Students should be able to do the research opportunities to pursue Ph.D. programme targeted approach of CSIR – NET examination. Enormous job opportunities at the level of chemical, pharmaceutical, food products, life oriented material industries.

Programme Specific outcome (PSO):

PSO: 1 Gains complete knowledge about all fundamental aspects of all the elements of chemistry.

PSO: 2 Understands the backgrounds of organic reaction mechanism, complex chemical structures, and instrumental method of chemical analysis, molecular rearrangements and separation techniques.

PSO:3 Appreciates the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds, structural determination of the complexes using theory and instruments

PSO: 4 Gathers attention about the physical aspects of atomic structure, dual behavior, reaction pathway with respect to time , various energy transformations, molecular assembly in Nano level, significance of electrochemistry, molecular segregation using the each symmetry

PSO: 5 Learns about the potential uses analytical Industrial chemistry, Medical chemistry and Green chemistry. Carryout experiments in the area of organic analysis, estimation, Separation, derivative process, inorganic, semi micro analysis, preparation, conduct metric and potentio metric analysis.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CC-I- INORGANIC CHEMISTRY -I	CO: 1 To know the structure and bonding in molecules/ions and predict the structure of molecules/ions. CO: 2 To learn the different definition of acids/bases and predict the reactions between acids and bases. CO: 3 To know the preparation and reactions of Boron group elements. CO: 4 To learn the selected crystal structure and to explain what kind of parameters that affects the crystal structure of the compound. CO: 5 To become familiar with some application of oxy acids of Sulphur, phosphorous and interhalogen compounds.
CC-II - ORGANIC CHEMISTRY -I	CO: 1 To learnt the nomenclature of the hetero nuclear aromatic compounds. CO: 2 To learnt the concept of stereochemistry and its importance CO: 3 To know what is aliphatic nucleophilic substitution. CO: 4 To familiarize the various types of aliphatic nucleophilic substitution reaction and their mechanism. CO: 5 To know the aliphatic electrophilic substitution reactions and their mechanisms and the concept of aromaticity.
CC-III - PHYSICAL CHEMISTRY -I	CO: 1 To study symmetry elements and symmetry operations. CO: 2 To know the orthogonality theorem and its consequences CO: 3 To learnt the determination of IR and Raman activity of vibrational modes in nonlinear molecules and to study selection rules for electronic transition. CO: 4 To know the detail study of Simultaneous reactions and study the kinetics of different types of reactions CO: 5 To learnt the reaction rate theories and reactions in solution and to know the concept of activity and activity coefficients and determination of activity coefficients.

CC-IV- ORGANIC CHEMISTRY PRACTICAL-I	CO: 1 To familiarize the solubility nature of organic substance of different functional group. CO: 2 To learnt the pilot separation of bimixtures CO: 3 To familiarize the systematic procedures of organic substance analysis CO: 4 To learnt two stage preparation involving nitration and bromination and involving molecular rearrangement oxidation. CO: 5 To learnt the preparation of derivative all functional groups and know the techniques involving drying and Recrystallization
CC-V - PHYSICAL CHEMISTRY PRACTICAL-I	CO: 1 To the preparation for each experiment and links therein. CO: 2 To know about the safety requirements and lab skills to perform physic-chemical experiments. CO: 3 Methods to measure equilibrium concentration and equilibrium constants for acid- base, solubility and complexation reactions by varying concentration and temperature CO: 4 To the preparation of buffer solutions at a required pH, given a choice of solution of acid/conjugate base pairs CO: 5 To know the principle and mechanism of conductometric and potentiometric titrations.
CC-VI- INORGANIC CHEMISTRY - II	CO: 1 To be able to use Crystal Field Theory to understand the magnetic properties of coordination compounds. CO: 2 To be able to describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters CO: 3 To become familiar with some applications of coordination compounds and to be able predict the geometries of simple molecules. CO: 4 To be able recognize the types of isomers in coordination compounds. CO: 5 To familiarize the preparation and properties of organometallic compounds.

CC-VII- ORGANIC CHEMISTRY - II	CO: 1 To learnt about the some specific examples of elimination reactions. CO: 2 The students should be able to know the basic mechanism of oxidation reactions CO: 3 To become familiarize the conformational analysis and dynamic stereo chemistry CO: 4 To know about the preparation and properties of carbohydrate, protein and peptides CO: 5 The students should be able to know about the nucleic acid and structure of DNA and RNA
CC – VIII - INORGANIC CHEMISTRY PRACTICAL-I	CO: 1 Well trained to analyze simple acid radicals, basic radicals and interfering radicals. CO: 2 Get skilled to separate inorganic mixture and identified as individual cations and anions through the experiments. CO: 3 To know the colorimetric experiments and analysis the colored solutions. CO: 4 To gain knowledge in analysis of inorganic mixture CO: 5 To get analyzing capacity of inorganic samples.
CC-IX- PHYSICAL CHEMISTRY PRACTICAL - II	CO: 1 The students should be able to know about the distribution law and principles of CST experiment. CO: 2 To familiarize the conductometric titrations. CO: 3 To know about the determination of activity and activity coefficient. CO: 4 To get knowledge about the adsorption properties. CO: 5 To familiarize the critical solution temperature
EC-I – (ELECTIVE COURSE) ADVANCED TOPICS IN PHYSICAL CHEMISTRY	CO: 1 The students should be able to know about the basics concept of quantum mechanics and orthogonality theorem CO: 2 To learnt about the application of wave mechanics and approximation methods. CO: 3 To understand the molecular spectroscopy CO: 4 To familiarize the basic principles, instrumentations and applications of IR, NMR and ESR spectroscopy CO: 5 To know the detail study of the photo chemistry and Radiation chemistry.

OEC – I*(OPEN ELECTIVE COURSE) GREEN AND INDUSTRIAL CHEMISTRY	CO: 1 The students should be able to understand the environment eco system, food chain and environmental pollutions CO: 2 To know about the green chemistry and water management and waste management. CO: 3 To learnt about the water chemistry and chemistry of explosive CO: 4 The students should be able to know about the Rupper, plastics and polymers. CO 5 To leant about the types of fuels and manufactures
OEC-I*(OPEN ELECTIVE COURSE) FORENSIC SCIENCE	CO: 1 The students should be able to understand the introduction to forensic science and collection of sampling CO: 2 To know the detail study of classification and techniques of finger printing CO:3 To familiarize biological sampling and know about the structure of blood and hemoglobin CO: 4 To know about the types of poison and analytical procedure. CO: 5 To clear understand about the types of drug dependence.
CC-X- INORGANIC CHEMISTRY – III	CO: 1 The students should be able to know about the principle, instrumentation and applications of electronic spectroscopy CO: 2 To familiarize the principle and applications of EPR spectroscopy CO: 3 To learnt about the Macrocyclic molecules and catalysis CO: 4 To understand the principles, analytical techniques and applications of TLC, HPLC, TGA, DTA , SEM and TEM CO: 5 To familiarize the Bioinorganic chemistry reaction mechanism and its applications.
CC-XI - ORGANIC CHEMISTRY -III	CO: 1 To learnt the addition and carbon-carbon multiple bon reactions and mechanisms CO: 2 To understand the properties of protecting functional groups CO: 3 To know about the principles and reaction mechanisms of retrosynthesis CO: 4 To know about the Nuclear magneticresonance spectroscopy, proton chemical shift, spin-spin coupling, coupling constants and application to organic structures ^{13}C resonance spectroscopy CO: 5 To learnt about the synthesis and reactions of alkaloids and Terpenes

CC – XII - PHYSICAL CHEMISTRY – III	CO: 1 The students should be able to understand the derivation of Maxwell – Boltzmann distribution equation. CO: 2 To know about the derivation of quantum statistics. CO: 3 To learnt about the quantum mechanical applications of Molecular orbital theory and hybridization of molecules. CO: 4 To familiarize the nanoscience and nanotechnology CO: 5 To know the various types of errors and linear regression and standard deviations.
CC-XIII - INORGANIC CHEMISTRY PRACTICAL- II	CO: 1 To know about the volumetric and gravimetric analysis of cations and anions. CO: 2 Making informal choice among post graduate opportunities for work or further Education. CO: 3 To know how to characterize products by physical and spectroscopic methods. CO: 4 To learnt the preparations ofpotassium and cobalt complexes. CO: 5 To familiarize the gravimetricand Titrimetric estimation ofmetal ions.
CC-XIV- ORGANIC CHEMISTRY PRACTICAL-II	CO: 1 To know about the estimation of phenol, aniline. CO: 2 To learnt about the estimation of saponification of oils and iodine vaue of oils CO: 3 To prepare p-bromo acetanilide from aniline CO: 4 To prepare 1,3,5- tribromobenzene from benzene . CO: 5 To familiarize the Preparation of p-nitroaniline fromacetanilide.
EC-II – INSTRUMENTATIO N AND MATERIAL CHEMISTRY	CO: 1 The students should be able to learn about the structural elucidation of simple molecules and ions. CO: 2 To learnt about the applications of mass bauer spectroscopy. CO: 3 To know about the principles of NQR spectroscopy CO: 4 To learnt about the principles of X-ray diffraction studies. CO: 5 To familiarize the radioactive decay and isotopic dilution methods.

EC-III- SPECIAL TOPICS IN ORGANIC CHEMISTRY	CO: 1 The students should be able to know about the fundamental concept of Jablonski diagram CO: 2 To know about the photo chemical rearrangement reactions. CO: 3 To know about the basic principles and mechanisms of pericyclic reactions. CO:4 To learnt about the basic properties and reaction mechanisms of heterocyclic compounds CO: 5 To familiarize about the principles of mass spectroscopy and ORD and CD.
EC- IV – (ELECTIVE COURSE) – ELECTRO AND SURFACE CHEMISTRY	CO: 1 The students should be able to understand the basic theories at the electrolyte-electrode interfaces. CO: 2 Outline electrochemical principles in corrosion and energy storage CO: 3 To know about the solubility product, common ion effect and neutral salt effects. CO: 4 To familiarize about the principles of chemisorption and physisorption. CO: 5 To know about the role of surface in catalysis and photo catalysis.

Department of B.Sc., COMPUTER SCIENCE (UG)

BACHELOR OF SCIENCE IN COMPUTER SCIENCE							
Curriculum Framework for the candidates to be admitted for the year 2019-2020							
SEM	**PART**	**TITILE**	**HRS**	**CRE**	**CIA**	**EE**	**TOT**
I	**I**	Language Course - I (Tamil)	6	3	25	75	100
	II	English Language Course - I (English)	6	3	25	75	100
	III	Core Course - I Problem solving using Python	5	5	25	75	100
		Core Course - II Problem Solving Lab	3	2	40	60	100
		Allied Course - I Basic Mathematics	4	4	25	75	100
		Allied Course - II Operations Research	4	4	25	75	100
	IV	VE - Value Education	2	2	25	75	100
II	**I**	Language Course - II (Tamil)	6	3	25	75	100
	II	English Language Course - II (English)	6	3	25	75	100
	III	Core Course - III Programming in C and Data structures	6	5	25	75	100
		Core Course – IV Data structures Using C Lab	3	2	40	60	100
		Allied Course - III Numerical and Statistical Methods	5	4	25	75	100
	IV	SKBC - I Data Analytic Lab	2	2	25	75	100
		EVS - Environmental Science	2	2	25	75	100
III	**I**	Language Course - III (Tamil)	6	3	25	75	100
	II	English Language Course - III (English)	6	3	25	75	100
	III	Core Course - V Object oriented programming using C++	5	5	25	75	100
		Core Course - VI OOPS Lab	3	2	40	60	100
		Allied Course - IV Applied Physics I	5	4	25	75	100
		Allied Course - V Applied Physics I Lab	3	-	-	-	-
	IV	SKBC - II Image Editing Lab	2	2	25	75	100
		GS - Gender Studies	0	1	25	75	100

SEM	PART	TITILE	HRS	CRE	CIA	EE	TOT
IV	I	Language Course - IV (Tamil)	6	3	25	75	100
	II	English Language Course – IV(English)	6	3	25	75	100
	III	Allied Course - V Applied Physics Lab	3	4	40	60	100
		Core Course - VII Database Systems	5	5	25	75	100
		Core Course - VIII RDBMS Lab	3	2	40	60	100
		Allied Course - VI Applied Physics II	5	4	25	75	100
	IV	NMEC I	2	2	25	75	100
		SSC - Soft Skills Course	0	2	25	75	100
V	III	Core Course - IX Programming in JAVA	6	5	25	75	100
		Core Course - X Principles of Operating System	5	5	25	75	100
		Core Course - XI Computer System Architecture	6	5	25	75	100
		Core Course - XII Java and System Administration Lab	6	4	40	60	100
		Elective Course - I	5	5	25	75	100
	IV	NMEC II	2	2	25	75	100
VI	III	Core Courses - XIII Computer Networks	6	5	25	75	100
		Core Course - XIV Software Engineering	6	5	25	75	100
		Elective Course - II	5	5	25	75	100
		Core Course - XV - Application Development Lab	6	4	40	60	100
		Elective Course - III	5	5	25	75	100
	IV	EA - Extension Activities	0	1	-	-	-
	III	Technical Skill Development	2	-	-	-	-
			180	**140**	**1105**	**2895**	**4000**
	III	Comprehensive Course		**4***			

Department of B.Sc., COMPUTER SCIENCE (UG)

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)	
PEO1:	develop creative and innovative methodologies for enhancing career and entrepreneurial skills
PEO2:	solve real time problems and work in team to accomplish a common goal.
PEO3:	acquire hands-on practical training to meet the industrial needs.
PEO4	apply new technologies in Computer Science to serve the needs of industry, society and the nation
PEO5:	obtain employment in the IT sector using the domain knowledge
PEO6:	pursue higher studies in the specialized domain.
PROGRAMME OUTCOME (PO)	
PO1:	**Scientific Knowledge** Apply the knowledge of computing fundamentals, principles of mathematical logic and domain knowledge to solve complex problems
PO2:	**Problem Analysis** Design and analyses of complex problems with appropriate methods
PO3:	**Design and Development of Solution** Finding solutions to the complex problems that meet the specific needs of the society
PO4:	**Conduct investigations of complex problems** Ability to design and develop algorithms by providing solutions to complex problems
PO5:	**Modern tool usage** Create, select and apply appropriate techniques, resources and IT tools to solve real life problems
PO6:	**Lifelong learning** Explore the need for independent life long learning in the broad context of technological advancements in the field of computer science

PROGRAMME SPECIFIC OUTCOME (PSO)	
PSO-1:	Apply the computing knowledge to design and develop the real world applications in various domains
PSO-2:	Solve the complex problems in the field of computer science with an understanding of the societal, legal and cultural impacts of the solution.
PSO-3:	Ability to develop algorithms and programs and analyze for the complexity
PSO-4:	Understand the concepts and ability to design and apply appropriate models.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CC-I PROBLEM SOLVING USING PYTHON	**CO1:** write programs to solve simple problems
	CO2: interpret and manipulate the data structures
	CO3: store and manipulate data using file system and handling errors
	CO4: solve problems using OOPs concept
	CO5: design GUI forms using Tkinter
CC-II PROBLEM SOLVING LAB	**CO1:** develop and execute programs using Operators and control Structures
	CO2: solve programs using sequences, functions and modules
	CO3: design and execute programs using OOPs concepts and Tkinter Module
AC-I BASIC MATHEMATICS	**CO 1:** recollect the basic concepts of matrices and differentiation.
	CO 2: understand the concepts about fundamental of ODE and characteristic equation of a linear transformation and Cayley Hamilton theorem.
	CO 3: solving the differential equations when the RHS is of the type e^{kx} $x^k e^{ax}x$. , , , ,
	CO 4: demonstrate the Laplace transform and the apply thedifferential equation and Fourier series, finding Fourier constants for periodic function with period 2π and half range Fourier series with period π.

AC-II OPERATIONS RESEARCH	**CO 1:** understand linear programs from standard business problems.
	CO 2: construct a project network and apply program evaluation review technique and critical path management.
	CO 3: apply the fundamental concept of sequencing problem.
	CO 4: solve the problems using PERT and CPM methods.
CC- III PROGRAMMING IN C AND DATA STRUCTURES	**CO1:** understand the basic concepts of C programming language
	CO2: apply arrays, functions, structures and union concepts in solving problems
	CO3: develop programs using pointers
	CO4: design and develop file handling tasks
	CO5: implement the fundamental data structures using C language
CC-IV DATA STRUCTURES USING C LAB	**CO1:** solve the problems using C language concepts
	CO2: implement the data structures using arrays and pointers
ACIII-NUMERICAL AND STATISTICAL METHODS	**CO 1:** understands different methods to solve the non-linear equations
	CO 2: acquire the knowledge of regression analysis
	CO 3: apply various methods to solve various integrals
	CO 4: apply various methods to solve various integrals
SKBC - I DATA ANALYTIC LAB	**CO1:** apply built in functions of spread sheet
	CO2: prepare charts using the data in the spreadsheet.
	CO3: to transpose a matrix and use pivot table
	CO4: demonstrate the data analysis using Data Analysis Toolpak in spreadsheet.

CC-V OBJECT ORIENTED PROGRAMMING USING C++	**CO1:** describe the basic concepts of OOP and the syntax of C++ language
	CO2: apply the knowledge of functions, classes and objects to solve problems in the real world.
	CO3: experiement destruction of objects the concepts of initialization and
	CO4: test the usage of overloading of unary and binary operators
	CO5: demonstrate the usage of inheritance and polymorphism while solving real time problem
	CO6: apply file concepts and solve problems related to data files.
CC- VI OOPS LAB	CO1: apply the concepts of C++ language to solve problems
AC-IV ALLIED PHYSICS –I	CO 1: Students should be able to apply the idea of transistors
	CO 2: Students can be evaluating the electronic devices for specific applications.
	CO 3: Students can be able to perform various conversion processes in digital electronics.
	CO 4: They can analyze and design various combinational and sequential circuits.
	CO 5: we learn the combinational circuits.
SKBC - II IMAGE EDITING LAB	CO1: apply various animation techniques
	CO2: apply various concepts of image editing using GIMP tool
AC-V - APPLIED PHYSICS PRACTICAL – II	CO 1: Understand the concepts and use research equipment (microscope, oscilloscope, etc.)
	CO 2: Design and conduct experiments that probe materials properties.
	CO 3: Work independently and function as a team.
	CO 4: Develop communication skills (oral, graphic and written).

CC - VII DATABASE SYSTEMS	**CO1:** understand the fundamentals of database system.
	CO2: design and create tables in database and execute queries.
	CO3: have knowledge about file system.
	CO4: design a database based on a data models using normalization.
	CO5: have knowledge in network and hierarchical database system.
CC - VIII RDBMS LAB	**CO1:** design and implement database schema for the given problem
	CO2: populate and query using DDL,DML,DCL,TCL
	CO3: prepare SQL reports.
	CO4: create implicit and explicit cursor.
	CO5: capable to create triggers, procedures and function.

AC-VI APPLIED PHYSICS –II	**CO 1:** Understand the basic working of 8051, which is the basic of all microcontroller
	CO 2: Know the working nature of microcontroller architecture, and programming techniques.
	CO 3: Know the fundamentals of port programming and interfacing techniques
	CO 4: Learn the techniques of serial port programming in 8051 and on interrupts.
	CO 5: To apply 8051 Interrupts for the Programming.
NMEC - I INTERNET AND WEB DESIGN	**CO1:** design and develop a static web page using HTML
	CO2: create an user interface using HTML forms
NMEC-I BPO AND HEALTH CARE	**CO1:** evaluate research and using measurement tools for quality and safety.
	CO2: access the skills in managing across boundaries - and evaluate how high quality services can best be designed, configured and delivered.
	CO3:effectively manage people, finances and organizational resources
	CO4:describe the opportunities and challenges in Indian Context
	CO5: carry out an organizational development project, demonstrate skills in learning from reflection of this experience and the skills to disseminate their projects.

CC - IX PROGRAMMING IN JAVA	**CO1**:identify the distinct properties and features of Object Orientations using JAVA
	CO2:analyze the name space, Exception conditions and concurrency condition in JAVA using package and Exception handling and Thread.
	CO3:discuss Input/Output functions with file manipulations using I/O Streams.
	CO4:analyze GUI programming applications using AWT packages.
	CO5:plan to develop Java based applications using GUI and user interface and database Connectivity.
CC - X PRINCIPLES OF OPERATING SYSTEM	**CO1:**understand the types, design, implementation of operating system and I/O programming concepts
	CO2: recognize the management of main and virtual memory schemes.
	CO3: work out different scheduling algorithms.
	CO4: analyze the management of devices.
	CO5: understand and analyze the information management.
CC- XI COMPUTER SYSTEM ARCHITECTURE	**CO1:** understand the basics of computer arithmetic
	CO2: know the importance and functions of CPU, ALU
	CO3: understand the memory and input-output organization
CC - XII JAVA AND SYSTEM ADMINISTRATION LAB	**CO1:** implement simple softwares using JAVA
	CO2: install LINUX operating system
	CO3: apply basic commands and solve simple administrative tasks using LINUX
EC-I WAP and WML	**CO1:** understand the WAP architecture
	CO2: analyze the WAP gateway
	CO3: demonstrate the WML concepts
	CO4: solve problems using WML Script
	CO5: apply the methodologies for securing applications

EC-II PRINCIPLES OF COMPUTER GRAPHICS	**CO1:** design two dimensional graphics.
	CO2: apply two dimensional transformations.
	CO3: design three dimensional graphics.
	CO4: apply three dimensional transformations.
	CO5: apply clipping techniques to graphics.
	CO6: design animation sequences.
EC-III SERVICE ORIENTED ARCHITECTURE	**CO1:** understand the software architecture, SOA evolution enterprise wide SOA and its applications.
	CO2: analyze the design and technologies of SOA
	CO3: identify the related technologies and implementation basics of SOA.
	CO4: understanding of the meta data management and web services security.
	CO5: recognize the transaction processing and specifications

NMEC II - OFFICE AUTOMATION LAB	**CO1:** create documents, apply formatting, editing text and paragraphs
	CO2: create document with tables
	CO3: create a document with mail merge
	CO4: use spreadsheet for calculations and apply formatting
	CO5: apply macro concept
	CO6: prepare a presentation for a seminar
NMEC-II IMAGE EDITING TOOLS LAB	**CO1:** apply various animation techniques
	CO2: apply various concepts of image editing using GIMP tool

CC - XIII COMPUTER NETWORKS	**CO1:** comprehend the basic types of networks, its classifications and properties of OSI and TCP/IP reference models
	CO2:recognize the guided and unguided media for communication
	CO3: acquire the design of the Data Link Layer with Data Link layer Protocols.
	CO4: create the shortest paths between two nodes using various routing algorithms.
	CO5: recognize the Transport Layer with TCP/IP and UDP protocols.
	CO6: ability to know the Application Layer using Protocols like SNMP, WWW, FTP, MIME and security
CC - XIV SOFTWARE ENGINEERING	**CO1:** demonstrate the ability to develop a high quality software system while working in a project group
	CO2: design architectural design for different environment
	CO3: produce software solution efficient, reliable, robust and cost effective
	CO4: expose the realities involved in developing software products for clients
	CO5: design, build and maintain large software systems
EC-IV WEB TECHNOLOGY	**CO1:** design a static web page using HTML
	CO2: validate the HTML form data using JavaScript
	CO3: develop server side scripts using PHP
	CO4: communicate with MySQL database from PHP
EC-V RUBY ON RAIL	**CO1:** understand the structure of Ruby programs and various data types, expression and operators
	CO2: use the control structures to solve simple and complex problems
	CO3: demonstrates OOP concepts
	CO4: develop networking applications
	CO5: solve the concurrency issues and understand the concept of security

EC-VI MOBILE APPLICATION DEVELOPMENT	**CO1:** understand the architecture of Android software stock.
	CO2: get the exposure of different types of project resources
	CO3: create their own application.
	CO4: enhance the application with LBS, Network features, etc.
	CO5: generate the APK and Market it in
CC - XV - APPLICATION DEVELOPMENT LAB	**CO1:** develop applications using two software packages
	CO2: solve simple and complex problems by the software's choosen
EC- VII .NET PROGRAMMING	**CO1:** understand the .NET framework
	CO2: understand the basics of VB.NET programming
	CO3: design and develop distributed problems
	CO4: develop web applications using ASP.NET
	CO5: interact with databases using ADO.NET
EC-VIII FUNCTIONAL PROGRAMMING USING HASKELL	**CO1:** use a strongly functional programming language
	CO2: analyze the basic functional programming and use JSON data
	CO3: identify various built in functions
	CO4: formulate various concept in pattern matching
	CO5: identify and analyze data structures
EC- IX R PROGRAMMIN G	**CO1:** understand the basics of R programming
	CO2: work with vectors, matrices and data frames
	CO3: acquire the knowledge of various control structures
	CO4: parse data files using built-in functions
	CO5: apply the various statistical functions and produce high quality graphics
Technical Skill Development	

M.Sc., Computer Science (PG)

NEHRU MEMORIAL COLLEGE [AUTONOMOUS]						
MASTER OF SCIENCE[COMPUTER SCIENCE] FROM 2019-2020						
CODE	**TITLE**	**HRS**	**CREDIT**	**CIA**	**EE**	**TOTAL**
SEMESTER - I						
CC-I	**Graph and Automata Theory**	6	5	25	75	100
CC-II	**Design and Analysis of Algorithms**	6	5	25	75	100
CC-III	**Advanced Data Base System**	6	5	25	75	100
CC-IV	**Open Source Technologies**	6	5	25	75	100
CC-V	**Lab - I – Open Source Technologies**	6	4	40	60	100
SEMESTER - II						
CC-VI	**Programming in JAVA and J2EE**	4	4	25	75	100
CC-VII	**Soft Computing**	5	4	25	75	100
CC-VIII	**Data Mining and Data Ware Housing**	5	4	25	75	100
CC-IX	**Lab-II- Java & J2EE**	6	4	40	60	100
CEC-I	**Principles of Wireless and Mobile Network**					
	Digital Image Processing	6	4	25	75	100
	Advanced Operating System					
OEC	**R Programming**					
	Web Technology	4	4	25	75	100
	Functional Programming using Haskell					
SEMESTER – III						
CC-X	**AI and Machine Learning**	5	4	25	75	100
CC-XI	**Principles of Compiler Design**	5	4	25	75	100
CC-XII	**Internet of Things**	4	4	25	75	100
CC-XIII	**Rapid Application Development Using Python**	4	4	25	75	100
CC-XIV	**Lab - III –Machine Learning**	6	4	40	60	100
CEC-II	**Cloud Computing**					
	Service Oriented Architecture	6	4	25	75	100
	Graphics and Human Computer Interaction					

SEMESTER - IV						
CEC-III	**Big Data Analytics**					
	Network Security	6	4	25	75	100
	Web Application Architecture					
CEC-IV	**Software Project Management**					
	Software Forensics	6	4	25	75	100
	Software Testing					
CC-XV	**PROJECT**	18	10	25	75	100
	TOTAL	**120**	**90**			**2000**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Post Graduates of M.Sc., Program will be able to

PEO1: Use the competence in the analysis of computer problems and finding solutions of those problems

PEO2: Utilizing the domain knowledge to help the society in the transformation process of digital world

PEO3: Applying their acquired knowledge and skills towards professional achievements in their carrier

PROGRAMME OUTCOME (PO)

At the end of the M.Sc., programme the students will be able to

PO1: Scientific Knowledge

Apply the knowledge of computing fundamentals, principles of mathematical logic and domain knowledge to solve complex problems.

PO2: Problem Analysis

Identify, formulate and analyze complex problems using appropriate methods and finding
solutions to problems.

PO3: Conduct investigations of complex problems

Design and develop algorithms by providing solutions to complex problems.

PO4: Modern tool usage

Ability to improve divulging knowledge in various domains and to solve real life
problem using various advanced software tools.

PO5: Individual and team work:

Function effectively as an individual and as a leader in diverse domain.

PO6: Lifelong learning

Recognize the need for an independent and lifelong learning in the technological change.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Apply knowledge of computing to develop quality program for real life problems

PSO2: Empower the use of software development tools and modern computing platforms.

PSO3: Ability to design dynamic website using open source technologies.

PSO4: Apply appropriate techniques and strategies to develop solutions to complex problems.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CC-I GRAPH AND AUTOMATA THEORY	**CO1: understand different types of graphs with applications.** **CO2: know strong background of graph theory which has diverse applications in many areas of computer science, engineering, etc.,** **CO3: mastering in regular languages and finite automata, push down automata** **CO4: mastering in context free languages.** **CO5: think analytically and develop the problem solving skills in theory of computer science**
CC-II DESIGN AND ANALYSIS OF ALGORITHMS	**CO1: define the various steps in algorithm.** **CO2: apply various techniques to real life problem.** **CO3: analyze complexity of the algorithm.**
CC-III DATABASE SYSTEMS	**CO1: understand the fundamentals of database system.** **CO2: design and create tables in database and develop ueries.** CO3: design a database based on a data models using normalization. CO4: explain database system architecture, distributed database
CC-IV OPEN SOURCE TECHNOLOGIES	**CO1: develop applications in different platforms.** **CO2: create interactive web pages using Perl and PHP.** **CO3: develop simple web applications.** **CO4: select suitable platform for real life problem.**
CC-V LAB-I-OPEN SOURCE TECHNOLOGIES	CO1: understand UNIX commands. CO2: create interactive web pages. CO3: develop simple applications in PHP and MySQL.
CC-VI PROGRAMMING IN JAVA AND J2EE	**CO1: design socket programming and TCP/IP protocol** **CO2: identify distributed hardware and software architecture and distributed environment** **CO3: identify RMI architecture and Java Servlets, apply the same to develop applications** CO4: develop real time web based applications using JSP CO5: build applications in J2EE server using Java Servlets and Java Server Pages

CC-VII SOFT COMPUTING	**CO1: apply fuzzy set theory to real life problem** **CO2: develop Neural Networks and Nero Fuzzy Model** CO3: apply Computational Intelligence
CC-VIII DATA MINING & DATA WARE HOUSING	**CO1: preprocess the data using various preprocessing techniques** **CO2: generate association rules using Apriori and FP-growth algorithms** **CO3: predict the class label of a given tuple using the classification techniques** **CO4: group the data using the basic clustering techniques** **CO5: summarize the concepts of warehouse, its architecture and multidimensional data models**
CC-IX LAB II-JAVA & J2EE	**CO1: write code on socket programming using TCP/IP and UDP** **CO2: design various real time applications using RMI** **CO3: develop various real time web based distributed applications using Java servlets,JSP**
CEC-I PRINCIPLES OF WIRELESS AND MOBILE NETWORK	**CO1: understand the basic concepts of Personal Communication Services (PCS) by wireless network fundamentals and topology.** **CO2: exposed to the required Operations Mobility Management and handoff** **CO3: design of the wireless WAN for GSM ,GPRS and CDMA.** **CO4: conversant with Broadband and Adhoc networks functionalities by IEEE wireless projects.** CO5: apply cognize the Wireless Geolocation System by E-911
CEC-I DIGITAL IMAGE PROCESSING	**CO1: describe digital image fundamentals and image enhancement** **CO2: apply knowledge on image restoration and segmentation** **CO3: use image compression techniques to real life models**
CEC-I ADVANCED OPERATING SYSTEM	**CO1: identify the services provided by operating systems** **CO2: solve problems involving process description and control.** **CO3: resolve Mutual exclusion, Deadlock detection** **CO4: apply the memory management techniques** **CO5: manage I/O devices, disk scheduling and file sharing.**

OEC-I R PROGRAMMING	**CO1: use R for statistical programming, computation, graphics, and modeling** **CO2: use R programming for research and scientific applications** **CO3: apply statistical tests for various research problems using R.** **CO4: identify and fit some basic types of statistical models**
OEC-I WEB TECHNOLOGY	**CO1: identify web browsers and network protocols** **CO2: design a web pages using HTML tags** **CO3: create a dynamic webpage using PHP and MySQL**
OEC-FUNCTIONAL PROGRAMMING USING HASKELL	**CO1: understand the simple functions** **CO2: develop functional programming in integrated deployment** **CO3: write haskell program using various built in functions** **CO4: apply various concept in pattern matching** **CO5: analyze concept of data structure**
CC-X -AI AND MACHINE LEARNING	CO1: solve the real life problems using AI techniques. CO2: identify appropriate AI methods to develop knowledge based solution. CO3: identify problems, through the concept of learning methods. CO4: apply various neural networks algorithms to real life problems. CO5: apply genetic algorithms for research problems.
CC-XI PRINCIPLES OF COMPILER DESIGN	**CO1: understand various types of translators and its functions** CO2: identify phases of compiler **CO3: design lexical analyzer and identify the similarities and differences among different parsing techniques** **CO4: formulate the different representation of intermediate code** CO5: evaluate the optimized code to generate code.
CC-XII IOT-INTERNET OF THINGS	**CO1: design a portable IoT using Arduino equivalent boards and relevant protocols** **CO3: deploy an IoT application and connect to the cloud** **CO4: analyze applications of IoT in real time applications.**
CC-XIII-RAPID APPLICATION DEVELOPMENT USING PYTHON	**CO1: install of python and its fundamentals** **CO2: apply various data structures** **CO3: compile the functions of files and exceptions** **CO4: develop OOP based programs** **CO5: using NumPy functions for developing applications**

CC-XIV-LAB- III - MACHINE LEARNING	**CO1: solve the real life problems using machine learning algorithms** **CO2: apply machine learning algorithms to datasets in different domains** **CO3: classify the datasets as training data and test data**
CC-II CLOUD COMPUTING	**CO1: apply the various types of clouds service and deployment models** **CO2: describe cloud computing architecture** **CO3: identify the basic cloud collaborating applications** CO4: apply cloud security to real time applications
CEC-II SERVICE ORIENTED ARCHITECTURE	**CO1: understand the software architecture, enterprise wide SOA, SOA K2 patterns and SOA programming models.** **CO2: critique the benefits of SOA** CO3: implement the SOA. **CO4: demonstrate the meta data management and web services security.** **CO5: analyze the transaction processing and web services security.**
CEC-II GRAPHICS AND HUMAN COMPUTER INTERACTION	**CO1: design effective dialog for HCI.** **CO2: design effective HCI for individual persons with disabilities.** **CO3: assess the importance of user feedback.** **CO4: explain the HCI implications for designing Web sites.** CO5: develop meaningful user interface.
CEC-III BIG DATA ANALYTICS	**CO1: analyze evolution and technologies requirement of big data** **CO2: predict mining data from data sets** **CO3: outline Components of Hadoop and Mapreduce functions and its K3 environment** **CO4: explain different working principles of Mapreduce** **CO5: formulate Hadoop cluster and select appropriate tool**
CEC-III NETWORK SECURITY	**CO1: identify major issues in network security** **CO2: identify and classify different types of attacks** **CO3: explain vulnerability, threats and attack** **CO4: compare symmetric and asymmetric encryption systems and their vulnerability to attack.**

CEC-III WEB APPLICATION ARCHITECTURE	**CO1: analyze the architecture of web applications** **CO2: design web pages using HTML and CSS** **CO3: identify appropriate programming languages to develop the application logic in both client and server.**
CEC-IV SOFTWARE PROJECT MANAGEMENT	**CO1: explain conventional software project management and software economica** **CO2: evaluate project management framework**
CEC-IV SOFTWARE FORENSICS	**CO1: identify hackers and normal users.** **CO2: apply the principles of computer forensics for security** **CO3: manage threats and the tactics**
CEC-IV SOFTWARE TESTING	**CO1: describe the testing process and its methodology** **CO2: identify and apply the various types of testing in real time problem** **CO3: design test cases** **CO4: design architecture for automation using tools.**

M.Sc. Data Science – Course Structure under CBCS - Batch 2019 onwards

Sem	Course	Course Code	Subjects	Ins. Hrs/ Week	Crs	Exam Hrs	Marks		
							Int	Ext	Total
I	CC-I	19PDS101	Mathematics for Data Science	6	5	3	25	75	100
	CC-II	19PDS102	Advanced Data Base Systems	6	5	3	25	75	100
	CC-III	19PDS103	Data Mining Techniques	6	5	3	25	75	100
	CC-IV	19PDS104	Information Security	6	5	3	25	75	100
	CC-V	19PDS105L	Data Base Systems & Data Mining Lab	6	4	3		60	100
	TOTAL			**30**	**24**				**500**
II	CC-VI	19PDS206	Probability and Statistical Computing	6	5	3	25	75	100
	CC-VII	19PDS207	Artificial Intelligence and Machine Learning	6	5	3	25	75	100
	CC-VIII	19PDS208L	Machine Learning Lab (Python/R)	6	4	3	40	60	100
	CEC-I	19PDS215a	Python Programming	6	4	3	25	75	100
		19PDS215b	R Programming						
	OEC-I	19PDS216a	Health Care Data Analytics	6	4	3	25	75	100
		19PDS216b	Social Media Mining						
	TOTAL			**30**	**22**				**500**
III	CC-IX	19PDS309	Multivariate Techniques	6	5	3	25	75	100
	CC-X	19PDS310	Big Data Analytics	6	5	3	25	75	100
	CC-XI	19PDS311L	Big Data Analytics –Lab	6	4	3	40	60	100
	CEC-II	19PDS317a	Natural Language Processing						
		19PDS317b	Financial Risk Analytics	6	4	3	25	75	100
	CEC-III	19PDS318a	Cloud and Web Intelligence						
		19PDS318b	Customer Relationship Management	6	4	3	25	75	100
	TOTAL			**30**	**22**				**500**
IV	CC-XII	19PDS412	Deep Learning	6	5	3	25	75	100
	CC-XIII	19PDS413	Predictive Analytics	6	5	3	25	75	100
	CC-XIV	19PDS414L	Predictive Analytics –Lab	6	4	3	40	60	100
	CEC-IV	19PDS419a	Business Intelligence						
		19PDS419b	Image and Video Analytics	6	4	3	25	75	100
	Project	19PDS420L	Internship/Project Work	6	4	-	25	75	100
	TOTAL			**30**	**22**				**500**
				120	**90**				**2000**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO1: Prepare graduates to become data professionals with comprehensive knowledge

PEO2: Prepare graduates to become continuous learner with societal focus

PEO3: Prepare graduates to become data scientist/data analyst/ Entrepreneurs in the Data Science industry

PEO4: To inspire the students to involve in data science competitions

PROGRAMME OUTCOME (PO)

PO1: Become knowledgeable in the subject of DATA SCIENCE and apply the principles of the same to the needs of the Employer/Institution/Enterprise/Society

PO2: Gain Analytical skills in the in the field/area of DATA SCIENCE

PO3: Understand and appreciate professional's ethics, community living and nation Building initiatives

PO4: To classify the relevant problems and understand the methods in data science

PO5: To apply the acquired knowledge to devise solutions to solve the real world problems

PO6: To distil complex data into actionable insights and analyse the methodology

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Apply Knowledge of data science in the domain of mathematics and computer science.

PSO2: solve the complex problems in the field of data science with an understanding of the societal, legal, and cultural impacts of the solution

PSO3: To provide a comprehensive understanding of machine learning techniques

PSO4: To introduce data analytics for various domain of interest

PSO5: To experience in implementation of methods involved in Data Science

Course Outcomes(Cos)

Name of the Course	Course Outcomes
Mathematics for Data Science	CO 1: Understand different mathematical concepts of data science with applications. CO 2: After the course the students will have a strong background of basic mathematics which has diverse applications in many area of data science, data analytics, etc., CO 3: Master regular languages and finite automata. CO 4: Master context free languages and calculus needed for language processing. CO 5: Familiar with thinking analytically and intuitively for problem analysis in related areas of theory in data science.
Advanced Data Base Systems	CO 1: Understand the fundamentals of database system. CO 2: Design and create tables in database and execute queries. CO 3: Design a database based on a data models using normalization. CO 4: Have knowledge about transaction concept.
Data Mining Techniques	CO 1: Preprocess the data using various preprocessing techniques CO 2: Generate association rules using Apriori and FP-growth algorithms CO 3: Predict the class label of a given tuple using the classification techniques CO 4: Group the data using the basic clustering techniques CO5: Summarize the concepts of warehouse, its architecture and multidimensional data models.
Information Security	CO 1: Discuss the basics of information security CO 2: Illustrate the legal, ethical and professional issues in information security CO 3: Demonstrate the aspects of risk management. CO 4: Become aware of various standards in the Information Security System CO 5: Design and implementation of Security Techniques.
Data Base Systems & Data Mining Lab	CO 1: Understand the fundamentals of database system. CO 2: Design and manipulate tables in database and execute queries. CO 3: Design a database based on a data models using normalization. CO 4: Have knowledge about transaction concepts. CO 5: Impart basic knowledge in advance database systems
Probability and Statistical Computing	CO 1: A good understanding of elementary probability theory and its application. CO 2: A good understanding of the laws of probability and the use of Bayes theorem. CO 3: A good understanding of the concept of a statistical distribution. CO 4: A good understanding of the standard uni-variate distributions & their properties CO 5: A good understanding of the basic concepts of statistical inference.
Artificial Intelligence & Machine Learning	CO 1: Identify learning problems, various concept learning methods CO 2: Identify the representation of neural networks CO 3: Enable to apply various machine learning techniques CO 4: Identify various advanced learning methods

Machine Learning Lab	CO 1: Familiar with the algorithms of machine learning methods CO 2: Gain Knowledge with techniques used for Knowledge Discovery in Databases CO 3: Analysis machine learning techniques in real world domain
Multivariate Techniques	CO 1: will appreciate the range of multivariate techniques available, CO 2: will be able to summarize and interpret multivariate data. CO 3: will have an understanding of the link between multivariate techniques and corresponding univariate techniques,
Big Data Analytics	CO1:Analyze evolution and concepts of big data CO2 :Predict mining data from data sets CO3:Outline Hadoop and Map reduce functions and its environment CO4:Explain different working principles of Map reduce CO5: Formulate Hadoop cluster and select appropriate tool
Big Data Analytics Lab	CO1: Ability how to Install Hadoop Ecosystem CO2: Compare strength and limitations of Pig and Hive CO3:To grouping and sorting using Pig programming language CO4: Annalise evolution and concepts of big data CO5: Predict mining data from data sets
Deep Learning	CO 1: Technical knowhow of AI applications, heuristics, Expert Systems, NLP, and Machine Learning techniques CO 2: Acquaintance with programming languages such as LISP and PROLOG. CO 3: Develop algorithms simulating human brain. CO 4: Implement Neural Networks in Tensor Flow for solving problems. CO 5: Explore the essentials of Deep Learning and Deep Network architectures.
Predictive Analytics	CO 1: Be able to apply the knowledge of computing tools and techniques in the field of Big Data for solving real world problems encountered in the Software Industries. CO 2: Be able to analyze the various technologies & tools associated with Big Data CO 3: Be able to identify the challenges in Big Data with respect to IT Industry and pursue quality research in this field with social relevance.
Predictive Analytics Lab	CO 1: Be able to identify the challenges in Big Data with respect to IT Industry and pursue quality research in this field with social relevance. CO 2: Predict mining data from data sets
Python Programming	CO 1: To develop proficiency in creating based applications using the Python Programming Language. CO 2: To be able to understand the various data structures available in Python programming language and apply them in solving computational problems. CO 3: To be able to do testing and debugging of code written in Python. CO 4: To be able to draw various kinds of plots using PyLab. CO 5: To be able to do text filtering with regular expressions in Python.
R Programming	CO 1: Familiar with the algorithms of machine learning methods. CO 2: Gain Knowledge with techniques used for Knowledge Discovery in Databases. CO 3: Analysis machine learning techniques in real world domain.
Health Care Data Analytics	CO 1: Analyse health care data using appropriate analytical techniques. CO 2: Apply analytics for decision making in healthcare services. CO 3: Apply data mining to integrate health data from multiple sources and develop efficient clinical decision support systems.

Social Media Mining	CO1: Work on the internal components of the social network. CO 2: Model and visualize the social network. CO 3: Mine the behavior of the users in the social network. CO 4: Predict the possible next outcome of the social network. CO 5: Mine the opinion of the user.
Natural Language Processing	CO 1: Upon completion of the course, the student should be able to: CO 2: Analyze the natural language text. CO 3: Generate the natural language. CO 4: Do machine translation. CO 5: Apply information retrieval technique.
Financial Risk Analytics	CO 1: Identify and categorize the various risks faced by an organization. CO 2: Explore the tools and practices needed to assess and evaluate financial risks. CO 3: Explore risk management practices in an industry. CO 4: Identify and solve legal issues that impact financial and other risk affecting business
Cloud and Web Intelligence	CO 1: Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing CO 2: Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc. CO 3: Explain the core issues of cloud computing such as security, privacy, and interoperability. CO 4: Know the concepts and terminologies related to web analytics. CO 5: Explore various parameters used for web analytics and their impact.
Customer Relationship Management	CO 1: Explore the concepts of customer relationship management with industry case studies. CO 2: Develop metrics for customer retention. CO 3: Apply data mining concepts to implement CRM in real world applications. CO 4: Devise strategies to implement CRM in any organization.
Business Intelligence	CO 1: Explain the fundamentals of business intelligence. CO 2: Link data mining with business intelligence. CO 3: Apply various modeling techniques CO 4: Explain the data analysis and knowledge delivery stages. CO 5: Apply business intelligence methods to various situations.
Image and Video Analytics	CO 1: Describe the fundamental principles of image and video analysis and have an idea of their application. CO 2: Apply image and video analysis in real world problems.

M.Sc., EMBEDDED SYSTEMS

Sem	Course	Title of the Course	Inst. Hrs/ Week	Credits	Ex. Hrs	Marks		
						Int.	Ext.	Total
I	CC-I	Fundamental of Embedded Systems	6	5	3	25	75	100
	CC-II	Analog Interfacing Devices for Embedded Systems	6	5	3	25	75	100
	CC-III	Design of Embedded Systems with PIC Microcontroller	6	4	3	25	75	100
	CC-IV	PIC Microcontroller Programming Lab	6	3	3	40	60	100
	CC-V	Embedded C Programming Lab	6	3	3	40	60	100
			30	**20**		**155**	**345**	**500**
II	CC-VI	Engineering Mathematics	5	5	3	25	75	100
	CC-VII	Mixed Signal Processors for Embedded Systems	5	4	3	25	75	100
	CC-VIII	AVR Architecture and Programming	5	4	3	25	75	100
	CC-IX	Mixed Signal Processors and AVR Programming Lab	5	3	3	25	75	100
	CEC-I	Candidate has to choose any one of the course from Group- I	6	5	3	25	75	100
	OEC-I	Candidate has to choose any one of the course offered by the Department/ Other Departments (or)Online Course	4	4	3	25	75	100
			30	**25**		**150**	**450**	**600**
III	CC-X	Real Time Operating System with ARM Microcontroller	5	5	3	25	75	100
	CC-XI	Programmable System on Chip	5	4	3	25	75	100
	CC-XII	ARM & PSoC Microcontroller Programming Lab	5	3	3	40	60	100
	CC-XIII	Internship	5	5	-	25	75	100
	CC-XIV	Circuit Design And Simulation Lab	4	3	3	40	60	100
	CEC- II	Candidate has to choose any one of the course from Group–II	6	5	3	25	75	100
			30	**25**		**180**	**420**	**600**
IV	CEC-III	Candidate has to choose any one of the course from Group –III	6	5	3	25	75	100
	CEC-IV	Candidate has to choose any one of the course from Group –IV	6	5	3	25	75	100
	CC- XV	Project	18	10	-	25	75	100
			30	**20**		**75**	**225**	**300**
			120	**90**		**560**	**1440**	**2000**

PROGRAM SPECIFIC OBJECTIVES

I. The Graduates of Embedded Systems will demonstrate their skills to meet the current and future industrial challenges in the field of embedded systems.

II. The ability to employ modern computer languages, environments, and platforms in creating innovative career paths, to be an entrepreneur.

III. The Graduates of Embedded Systems will undertake a significant research or development of projects.

IV. The graduates will be capable of understanding and implementing the building blocks of real time applications using integrated development environment for automation in the related field.

V. The Graduates of Embedded Systems will exhibit their skills to take-up hardware/software co-design for embedded systems.

VI. Demonstrate outstanding analytical and technical skills to evaluate analyze and solve real time problems in Embedded Systems.

PROGRAM OUTCOMES

The Student of Embedded Systems will be able to:

A. Apply the acquired knowledge from undergraduate courses and other disciplines to identify, formulate and present solutions to technical problems related to various areas of Embedded Systems.

B. Ability to apply knowledge of Mathematics, Physics, Biology, and Electronics to solve complex engineering problems or processes that meet the specific needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

C. Develop confidence, improve their professional value and motivation for self-education and imbibe professional values for lifelong learning.

D. Ability to identify, formulate and solve engineering problems of multidisciplinary nature.

E. Use the techniques, skills, Integrated Development Environment (IDE) tools, operating systems, software and equipment necessary to evaluate and analyze the systems in real time environments.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
FUNDAMENTALS OF EMBEDDED SYSTEMS	• An ability to design a system, component, or process to meet desired needs within realistic constraints. • Describe the differences between the general computing system and the embedded system, also recognize the classification of embedded systems. • Design real time embedded systems using the concepts of RTOS. • Foster ability to understand the role of embedded systems in industry.
ANALOG INTERFACING DEVICES FOR EMBEDDED SYSTEMS	• Discuss the op-amp's characteristics, parameter limitations, various configurations and countless applications of op-amp. • Create analytical design and development solutions for sensors and actuators. • Applications and selection of sensors for particular application.
PIC MICROCONTROLLER PROGRAMMING LAB	• Get experience with a set of tools for embedded systems programming and debugging. • Gain hands-on experience in interfacing peripherals to the PIC microcontrollers. • Configured the PIC18 analog-to-digital converter to measure physical quantities. • Implementation of several embedded systems with particular focus on the interaction between multiple devices. • Create an embedded system application.
EMBEDDEDC PROGRAMMING LAB	• Read, understand and trace the execution of programs written in Clanguage. • Write the C code for a givenalgorithm. • Implement Programs with pointers and arrays, perform pointer arithmetic, and use thepre-processor.

ENGINEERING MATHEMATICS	• Recognize the relationships between different areas of mathematics and the connections between mathematics and other disciplines. • Use computational techniques and algebraic skills essential for the study of systems of linear equations, matrix algebra, eigenvalues and eigenvectors. • Develop Fourier series for different types of functions. • Understanding of elementary probability theory and its applications. •
MIXED SIGNAL PROCESSOR FOR EMBEDDED SYSTEMS	• Describe the MSP architectures and its feature. • Embedded C programming techniques for 16-bit platform. • Interface the advanced peripherals to MSP. • Embedded protocols and its interfacing techniques for mixed signal processors. • Design embedded system with available resources for simple applications using MSP. •
AVR ARCHITECTURE AND PROGRAMMING	• Design and development the electronic systems based on AVR microcontrollers. • Know how to write code to interface to sensors/devices with various communication protocols. • Install the development software and program on AVR microcontroller. • Foster ability to understand the design concept of embedded systems. •

MIXED SIGNAL PROCESSORS AND AVR PROGRAMMING LAB	• Familiarize with the assembly level and embedded C programming using AVR studio and Keil compiler. • Understand the concept of mixed signal processing and processor. • Develop system to transfer data to one device to another device. • Apply the concepts on real- time applications
REAL TIME OPERATING SYSTEMS WITH ARM MICROCONTROLLERS	• Describe the architecture of processors. • Develop program displaying digital logic and mathematics ARM instruction set. • Solve real time problem and construct a complete system as a solution. • Integrate and build a working model using the laboratory components and IDE tools. •
PROGRAMMBLE SYSTEM ON CHIP	• Under the concept of PSoC systems. • Configured the hardware and software co-design. • Implementation of PSoC system to any applications. •
ARM AND PSoC PROGRAMMING LAB	• Understand the Procedure to execute programs with a simulator by using an IDE • Develop simple and complex programs. • Interface external peripheral devices to ARM cortex M4 processor. • Understand the interfacing of I/O devices to tiva 123/129 launch pad. • Configured the analog and digital system of PSoC. • Develop real time embedded system applications

CIRCUIT DESIGN AND SIMULATION LAB	• Become familiar with the basic circuit components and know how to connect them to make a real electrical circuit. • Able to gain practical experience related to electrical circuits, stimulate more interest and motivation for further studies of electrical circuits. • Able to carefully and thoroughly document and analyze experimental work.
ROBOTICS	• Understand the components and basic terminology ofRobotics. • Ability to model the motion of Robots and analyze the workspace and trajectory panning of robots. • Develop application based Robots. • Formulate models for the control of mobile robots in various industrial applications.
EMBEDDED NETWORKING	• Understand the basic concept of network and types of communication protocol. • Understand the significance of embedded networks in real time applications and to use it for specific.
HARDWARE SOFTWARE CO-DESIGN	• Assess prototyping and emulation techniques. • Compare hardware / software co-synthesis. • Formulate the design verification and validate its functionality by simulation
PROGRAMMING IN JAVA	• Design problem solutions using Object Oriented techniques. • Apply the concepts of data abstraction, encapsulation, polymorphism, overloading, and inheritance for problem solutions. • Use the OOPs concepts of Java appropriately in problem solving.

EMBEDDED LINUX	• Understand the development of environment setup. • Learn about drivers and kernel development. • Learn to configure and build a customized Linux kernel. • Grasp the concept of modern Linux for embedded systems. • Create and test programs that perform I/O and networking application.
SOFT COMPUTING	• Learn the approaches to intelligent control, architecture for intelligent control. • Implement machine learning through neural networks. • Develop a Neuro fuzzy expert system. • Use the optimization techniques to solve the real world problems.
PYTHON WITH RASPBERRY PI	• Write their own code in python for a specific application. • Develop application programs in Python. • Implement applications on Raspberry Pi. • Develop and Implement Embedded/IOT applications using Python and Raspberry Pi.
WIRELESS SENSOR NETWORKS	• Describe the area of wireless sensor networks. • Describe the current research and development issues in wireless sensor networks. • Demonstrate deeper methodological knowledge in wireless sensor networks.
ADVANCED DIGITAL IMAGE PROCESSING	• Understand image formation and the role of human visual system plays in perception of gray. • Apply the appropriate image processing algorithm to process, enhance and either extract or impart information from the image. • Learn the signal processing algorithms and techniques in image enhancement and image restoration.

INTERNET OF THINGS	• Students will develop more understanding on the concepts of IOT and its present developments. • Study about different IOT technologies. • Acquire knowledge about different platforms and Infrastructure for IOT. • Learn the art of implementing IOT for smart applications and control.
ADVANCED ARM MICROCONTROLLER	• Understand the architecture and programming of ARM processors. • Develop programming to real world applications. • Acquire knowledge to get data from the external devices for data processing. • Develop their employability and entrepreneurship skills.
NETWORK ON CHIP	• Understand the need for 3D NOC. • The concepts used in testing and reduction of power in NOC. • Ability to learn the architecture and working of routers in 3D NOC.
THE 8051 MICROCONTROLLER ARCHITECTURE AND PROGRAMMING	• Understand the basic working of 8051, which is the basic of all microcontrollers. • Know the working nature of different peripherals, and programming techniques. • Implementation of the programming sequence using Keil C and loading the same to some application oriented boards.
ADVANCED MICROCONTROLLER	• Provide an overview of the microcontroller architecture and programming. • Use an integrated development environment to program. • Understand and use analog to digital converters, digital to analog converters and other peripherals.
ONLINE COURSE	• An Online Course is aimed at unlimited participation and open access via the web. Online course is a model for delivering learning content online to any person who takes a course, with no limit on attendance.

	• A student shall undergo an online course for award of the degree besides other requirements. A student is offered this Online Course at the beginning of their II Semester of study and the course has to be completed at the end of II Semester. • If the student fails to complete the course by the end of II Semester, it shall be treated as a backlog and needs to be completed before completion of the program for the award of the degree. A student has a choice of registering for only one online courses with the recommendation of Course coordinator. • The student shall undergo online course without disturbing the normal schedule of regular class work. One faculty member assigned by the Coordinator shall be responsible for the periodic monitoring of the course implementation. • If any student wants to change the online course already registered, he will be given choice to register a new online course in II Semester only. Finally, the performance of the student in the course will be evaluated as stipulated by the course provider. • A certificate will be issued on successful completion of the course by the course provider. The performance in the online course will not be considered for the calculation CGPA of the student. The online course will be listed in the grade sheets of the student.

NEHRU MEMORIAL COLLEGE (AUTONOMOUS)

UG Programme(Mathematics) – Course Structure CBCS

For the candidates admitted from 2019 – 2020 onwards

Sem	Part	Code	Title of Course	Hrs/Wk	Cr	Marks		
						Int.	Ext.	Tot.
I	I	19T101	LC I – Tamil I	6	3	25	75	100
	II	19H101	ELC II – English I	6	3	25	75	100
	III	19M101	CC I – Calculus	5	4	25	75	100
	III	19M102	CC II – Trigonometry and Algebra	4	4	25	75	100
	III	19M103A	AC I – Allied Physics I	4	4	25	75	100
	III	19M104L	AC II – Physics Lab*	3	-	-	-	-
	IV	19VE	VE – Value Education	2	2	25	75	100
		Total	**7**	**30**	**20**	**150**	**450**	**600**
II	I	19T202	LC II – Tamil II	6	3	25	75	100
	II	19H202	ELC II – English II	6	3	25	75	100
	III	19M205	CC III – Differential Equations and its Applications	4	4	25	75	100
	III	19M206	CC IV – Laplace Transforms and Summation of Series	3	2	25	75	100
	III	19M104L	AC II – Physics Lab*	3	4	40	60	100
	III	19M207A	AC III – Allied Physics II	4	4	25	75	100
	IV	19XM21L	SKBC I – MS Office	2	2	25	75	100
	IV	19EVS	EVS – Environmental Studies	2	2	25	75	100
		Total	**8**	**30**	**24**	**215**	**585**	**800**
III	I	19T303	LC III – Tamil III	6	3	25	75	100
	II	19H303	ELC III – English III	6	3	25	75	100
	III	19M308	CCV – Analytical Solid Geometry	5	4	25	75	100
	III	19M309A	AC IV – Probability Theory	6	4	25	75	100
	III	19M310A	AC V – Statistical Methods	5	4	25	75	100
	IV	19XM32L	SKBC II – SCILAB	2	2	25	75	100
	IV	19GS	GS – Gender Studies	-	1	-	100	100
		Total	**7**	**30**	**21**	**150**	**550**	**700**

Sem	Part	Code	Title of Course	Hrs/Wk	Cr	Marks		
						Int.	Ext.	Tot.
IV	I	19T404	LC IV – Tamil IV	6	3	25	75	100
	II	19H404	ELC IV – English IV	6	3	25	75	100
	III	19M411	CC VI – Vector Calculus , Fourier Series & Transforms	5	4	25	75	100
	III	19M412	CC VII– Numerical Methods	5	4	25	75	100
	III	19M413L	AC VI – R- Programming Lab	6	4	25	75	100
	IV	19M4N1	NMEC II – Quantitative Aptitude I	2	2	25	75	100
	IV	19SSC	SSC – Soft Skill Course	-	2	-	100	100
		Total	**7**	**30**	**22**	**150**	**550**	**700**
V	III	19M514	CC VIII – Modern Algebra	6	5	25	75	100
	III	19M515	CC IX – Real Analysis I	6	5	25	75	100
	III	19M516	CC X – Mechanics	6	5	25	75	100
	III	19M517	CC XI – Graph Theory	5	4	25	75	100
	III	19M518**	EC I	5	5	25	75	100
	IV	19M5N2	NMEC II – Quantitative Aptitude II	2	2	25	75	100
		Total	**6**	**30**	**26**	**150**	**450**	**600**
VI	III	19M619	CC XII – Real Analysis II	6	5	25	75	100
	III	19M620	CC XIII – Complex Analysis	6	5	25	75	100
	III	19M621	CC XIV- Discrete Mathematics	5	4	25	75	100
	III	19M622	CC XV – Mathematical Modeling	3	2	25	75	100
	III	19M623**	EC II	5	5	25	75	100
	III	19M624**	EC III	5	5	25	75	100
	V	19EA	Extension Activities	-	1	-	-	-
		Total	**7**	**30**	**27**	**150**	**450**	
TOTAL			**42**	**180**	**140**	**965**	**3035**	**4000**

Programme Educational Objectives (PEO)

PEO 1: To qualify the students to become successful professionals by demonstrating logical and analytical thinking abilities.

PEO 2: To provide knowledge in the breadth and depth of mathematics, including the connections between different areas of mathematics.

PEO 3: Gain experience investigating the real world problems and learn how to apply mathematical ideas and models to those problems.

PEO 4: Analyze the use of computer technology to solve problems and to promote understanding.

Program Outcome (PO)

PO 1: Become knowledgeable in the subject of Mathematics and apply the principles of the same to the needs of the Employer/Institution/Enterprise/Society.

PO 2: Gain analytical skills in the field of Mathematics

PO 3: Understand and appreciate professional ethics, community living and Nation Building initiatives.

PO 4: To develop important analytical and logical skills and problem solving strategies to assess a broad range of issues in real life.

PO 5: To expose a wide range of modern mathematical ideas from pure and applied mathematics to graduate with both technical and quantitative skills that are in demanding the modern world.

PO 6: To acquire mathematical knowledge and understanding in advanced areas of mathematics from the given courses that provides a solid foundation for future learning

Programme Specific Outcome (PSO)

PSO 1: Apply the knowledge of Mathematics in the domain of Science, Engineering and Technology

PSO 2: Solve the complex problems in the field of mathematics with an understanding of the societal, legal and cultural impacts of the solution.

PSO 3 : Familiar with a variety of examples where mathematics helps accurately explain abstract or physical phenomena.

PSO 4 : Able to independently read mathematical literature of various types, Including survey articles, scholarly books, and online sources.

PSO 5 : Life-long learners who are able to independently expand their mathematical expertise when needed, or for interest's sake.

PSO 6 : Recognize the importance and value of mathematical and statistical thinking, training and approach to problem solving, on a diverse variety of disciplines.

Course Outcomes(COs)

Name of the Course	Course Outcomes
CCI - Calculus	CO 1: acquire the concept of successive differentiation, maxima and minima Functions. CO 2: apply the concepts of Beta and Gamma functions to multiple integrals. CO 3: use reduction formula to evaluate integrals. CO 4: evaluate radius of curvature, evolutes and involutes.
CC II – Trigonometry and Algebra	CO 1: acquire the knowledge of circular function. CO 2: give illustration of Eigen value and Eigen vector, symmetric, orthogonal and unitary matrix . CO 3: apply the concepts of theory of equations and inequalities.
CC III-Differential Equations and its Applications	CO 1: acquire the knowledge of the first order ODE and PDE. CO 2: solve the problems choosing the most suitable method. CO 3: model the real world scenarios using ODE, PDE. CO 4: sense the essential difference between ODE and PDE.
CC IV-Laplace Transforms & Summation of series	CO 1: acquire the knowledge of transforms and series. CO 2:understand the concept of Laplace transforms and its properties. CO 3: apply the method of finding the solution of differential equation. CO 4: evaluate the summation of power series.

SKBC I -MS Office	CO 1: gain the basic knowledge of Microsoft Office. CO 2: understand the ethical issues in saving word processing documents. CO 3: apply designs to enhance the looks of the presentation. CO 4: analyze the use of Microsoft word, Excel and Power point.
CC- V- Analytical Solid Geometry	CO 1: recollect the basic concept of equation of a plane, straight line the sphere and binomial, exponential and logarithmic series. CO 2: understand about the concept of forming a plane of a equation and to find angle between the plane and line, co-planer lines, volume of tetrahedron. CO 3: get the clear idea to form an equation of a sphere passing through a given circle, intersection of two spheres is a circle and the equation of the tangent plane. CO 4: demonstrate the binomial theorem for a rational index, applications, summation of series and recurring series.
AC – IV- Probability Theory	CO 1: gain the knowledge of random variable and probability distributions. CO 2: understand the basic concepts of discrete and continuous distributions nd their properties. CO 3: apply the various distributions suitably to real life problems CO 4: compute expectations, variance and other higher order moments of the distributions.
AC – V – Statistical Methods	CO 1: acquire the knowledge of correlation, regression and sampling distributions. CO 2: understand the necessity of various techniques for robust statistical inference. CO 3: apply the concept of estimation to the parameter of sampling distributions. CO 4: evaluate expectation, variance, mgfs, characteristic functions and estimators.

SKBC II-SCILAB	CO 1: gain knowledge about implementation of simple mathematical functions / equations in numerical computing environment. CO 2: understand the need for simulation /implementation for the verification of mathematical functions. CO 3: apply simple mathematical functions and operations on using plots. CO 4: analyze various SCILAB command.
CC VI - Vector Calculus, Fourier Series & Fourier Transforms	CO 1: acquire the concept of the vector differentiation, vector integration, Fourier series and Fourier Transforms. CO 2: understand the practical utility of gradient, divergent & curl. CO 3: apply the divergence, curl and scalar potential to real life problems. CO 4: evaluate the multiple integrals and Fourier series for periodic function and Fourier Transforms for a periodic functions.
Numerical Methods	CO 1: gain the knowledge of solving an algebraic or transcendental equation using an appropriate Numerical Methods. CO 2: understand the mathematical concepts underlying the Numerical Methods. CO 3: apply Numerical Methods to obtain approximate solutions to mathematical problems. CO 4: analyze the accuracy of common Numerical Methods. CO 5: evaluate a derivative at a value using an appropriate Numerical Methods.
AC VI-R Programming Lab	CO 1: gain knowledge about different data types and different data structures in R. CO 2: understand basic regular expressions in R CO 3: apply the various graphics in R for data visualization. CO 4: analyze the uses of R for descriptive statistics and inferential statistics.

NMEC - I Quantitative Aptitude- I	CO 1: acquire the meaning of HCF and LCM of numbers. CO 2: understand the concepts of odd man out & series. CO 3: analyze the concepts of ratio & proportion. CO 4: apply the concepts of profit & loss in real life problems.
CC VIII-Modern Algebra	CO 1: gain the knowledge about concepts of sets, mapping, relations and some basic definition of groups & subgroups. CO 2: understand the importance of algebraic properties with regard to working within various number systems. CO 3: apply the results from group theory to study the properties of rings and fields and to possess the ability to work within their algebraic structure. CO 4: analyze the concepts of homomorphism and isomorphism for groups, rings and field.
CC – IX- Real Analysis-I	CO 1: acquire the knowledge of basic concepts of real analysis, sets, functions, mathematical induction and completeness property. CO 2: understand the concept of continuity, convergent sequence, subsequence and divergent sequence. CO 3: obtain the limit of various functions. CO 4: analyze the extension of limit concepts.
CC X-Mechanics	CO 1: acquire the knowledge of forces acting at point and equilibrium of three forces acting on a rigid body. CO 2: understand types of forces, moments and frictions. CO 3: apply the laws of impact to steady collision of bodies CO 4: evaluate the differential equation of central orbit, and pedal – equations.
CC XI - Graph Theory	CO 1: acquire the knowledge of the fundamental concepts in graph theory. CO 2: understand the concept of cut points, bridges and blocks. CO 3: apply the concept of Eulerian graph and Hamiltonian graph. CO 4: evaluate the problems involving vertex connectivity and edge connectivity. CO 5: analyze the concept of Factorization.

NMEC II- Quantitative Aptitude- II	CO 1: gain the knowledge of basic algebraic formulas. CO 2: understand the formulation of problem quantitatively and using appropriate arithmetical and statistical methods to solve the problems. CO 3: apply the concept of time and work on real life problems. CO 4: analyze the problem on trains with solved examples.
CC – XII - Real Analysis-II	CO 1: gain knowledge about the basic properties of Riemann integral. CO 2: understand the differentiability of real functions and its related theorems. CO 3: apply chain rule and inverse function theorem. CO 4: evaluate the properties of derivatives. CO 5: analyze the advanced concepts of real analysis.
CC – XIII- Complex Analysis	CO 1: acquire knowledge about continuity and differentiability of complex functions. CO 2: understand Taylor's and Laurent's expansion of simple functions. CO 3: apply the methods of complex analysis to evaluate definite integrals and limit of infinite series. CO 4: study the nature of singularities and evaluate residues. CO 5: analyze the applications of Complex Analysis.
CC XIV - Discrete Mathematics	CO 1: acquire knowledge to write an argument using logical notation. CO 2: understand the basic principles of sets and operations in sets. CO 3: apply the rules of inference and methods of proof including direct and indirect proof form, proof by contradiction and mathematical induction. CO 4: analyze logic sentence in terms of predicates, quantifiers and logical connectives. CO 5: evaluate Boolean functions and simplify expression using the properties of Boolean Algebra.

CC-XV - Mathematical Modeling	CO 1: acquire the knowledge of model through graphs. CO 2: understand the concept of mathematical modeling through ordinary differential equations. CO 3: apply some models on basic theory of linear difference equations. CO 4: analyze and frame mathematical models using ordinary differential equation.
EC I - Programming in 'C' with lab	CO 1: acquire the knowledge of the structure of C programming language and it development. CO 2: understand the structured programming language C CO 3: apply the concepts of point and array. CO 4: analyze the use of structured programming in numerical problem solving.
Fuzzy Theory	CO 1: the knowledge of important basics of fuzzy set theory. CO 2: understand the basic mathematical elements of the theory of fuzzy sets. CO 3: apply fuzzy logic to control theory. CO 4: analyze statistical logic method. CO 5: evaluate fuzzy statistical applications.
Operations Research	CO 1: gain the knowledge of scientific approaches to decision – making. CO 2: understand the mathematical tools that are needed to solve optimization problems. CO 3: apply the concepts of simplex method and its extensions to dual simplex algorithm. CO 4: analyze the general non linear programming problems. CO 5: evaluate critical path and optimized cost using CPM and PERT to project scheduling and controlling problems.

Astronomy	CO 1: gain the knowledge to use mathematics to perform calculations on earth and/ or space science problems. CO 2: understand the use of our galaxy to contrast and compare it with other galaxies as to type, content, age, luminosity, motion and size. CO 3: apply the principle findings, common applications, current problems, fundamental techniques and underlying theory of the astronomy. CO 4: analyze the size, age structure and motion of the universe over all using cosmological models.
CC XIV- Object Oriented Programming in C++ with Lab	CO 1: gain knowledge about the structure and model of the C++ programming language. CO 2: understand C++ programming language by using various programming techniques. CO 3: apply C++ programs to solve simple problems. develop some software based on mathematics problems in the C++ programming language. CO 4: evaluate user requirements for software functionality required to decide whether the C++ programming language can meet user requirements. CO 5: analyze the uses of certain techniques by implementing them in the C++ programming language to solve the given problem.
Number Theory	CO 1: gain the knowledge to find quotients and remainders from integer division. CO 2: understand the definitions of congruence, residue classes and least residues. CO 3: apply Euclid's algorithm and backwards substitution. CO 4: analyze hypothesis and conclusions of mathematical statements (or) analyze learning methods and techniques used in number theory. CO 5: evaluate multiplicative inverse, modulo n and use to solve linear congruence.

Allied Mathematics

AC-I Allied Mathematics- I	CO 1: recollect basic concepts of Binomial, Exponential series, matrices. CO 2: understanding the concepts of the characteristic equation and its applications in matrices. CO 3: apply the integral concepts to extend the study of multiple integrals. CO 4: express the given series in Fourier form
AC II -Allied Mathematics II	CO 1: recollect basic concepts of Differentiation and Trigonometry. CO 2: understanding about the concept of successive derivatives, Leibnitz's theorem, Jacobians and curvature and maxima and minima of a function of two variables. CO 3: get an idea about trigonometric functions $\sin^n$, $\cos^n$, expansion of in powers of sin and cos , Hyperbolic functions and Inverse Hyperbolic functions. CO 4: solving the polynomial equations using interpolating methods: Newton's forward, backward and Lagrange's methods.
AC-III Allied Mathematics-III	CO 1: remember the basic concepts of Differential Equations, Integration and Vector. CO 2: understanding about the concept of Formation of differential equations and solving the partial differential equations. CO 3: get an idea about the Laplace transforms and apply the differential equations. CO 4: get an idea about the Laplace transforms and apply the differential equations.

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AC I - Basic Mathematics	CO 1: recollect the basic concepts of matrices and differentiation. CO 2: understand the concepts about fundamental of ODE and characteristic equation of a linear transformation and Cayley Hamilton theorem. CO 3: solving the differential equations when the RHS is of the type $e^{kx}, sinkx, coskx, x^k, e^{ax}x$. CO 4: demonstrate the Laplace transform and the apply the differential equation and Fourier series, finding Fourier constants for periodic function with period 2π and half range Fourier series with period π.
AC-II- Operations Research	CO 1: understand linear programs from standard business problems. CO 2: construct a project network and apply program evaluation review technique and critical path management. CO 3: apply the fundamental concept of sequencing problem. CO 4: solve the problems using PERT and CPM methods.
ACIII- Numerical and Statistical Methods	CO 1: understands different methods to solve the non-linear equations CO 2: acquire the knowledge of regression analysis CO 3: apply various methods to solve various integrals CO 4: apply various methods to solve various integrals
AC I- Statistical Methods	CO 1: acquire the concepts of Mean, Median and Standard deviation CO 2: understand the knowledge of Skewness and Kurtosis, Correlation and Regression Analysis CO 3: apply the knowledge of axiomatic approach to independent events CO 4: evaluate the Binomial, Poisson and Normal Distribution
AC II- Operations Research for Computer Applications	CO 1: convert standard business problems into linear programs. CO 2: solve linear programming problems by Graphical solution, Simplex and Big-M method. CO 3: apply the fundamental concept of sequencing problem. CO 4: evaluate the PERT and CPM.
Algebra and	CO 1: Understand the concepts of types of matrices, successive

Calculus	differentiation, integration and Laplace transform. CO 2: Find the Eigen values and vectors, Leibnitz's theorem and its application. CO 3: Apply the concepts of Laplace transforms of e^{at}, $\cos at, \cos hat$, t^n and integration by parts and its properties. CO 4: Solve the second order differential equation of the type e^{kx}, $\sin kx, \cos kx, x^k, e^{ax}X$.
Operations Research	CO 1: understand linear programs from standard business problems. CO 2: construct a project network and apply program evaluation review technique and critical path management. CO 3: apply the fundamental concept of sequencing problem. CO 4: solve the problems using PERT and CPM methods.

Mathematics

Post Graduate Programme Course Structure CBCS
(For the candidates admitted from 2019-2020 onwards)

Sem	Subject Code	Course	TITLE	HOURS	CREDIT	Int	Ext	TOTAL
I	19PM101	CC-I	Algebra	6	5	25	75	100
	19PM102	CC-II	Real Analysis – I	6	5	25	75	100
	19PM103	CC-III	Ordinary Differential Equations	6	4	25	75	100
	19PM104	CC-IV	Integral Equations, Calculus of Variations and Fourier Transforms	6	4	25	75	100
	19PM105	CC-V	Classical Dynamics	6	5	25	75	100
	Total			**30**	**23**	**125**	**375**	500
II	19PM206	CC-VI	Linear Algebra	6	5	25	75	100
	19PM207	CC-VII	Real Analysis – II	6	5	25	75	100
	19PM208	CC-VIII	Topology	6	5	25	75	100
	19PM209	CC-IX	Partial Differential Equations	6	4	25	75	100
		OEC	Open Elective Course	6	4	25	75	100
	Total			**30**	**23**	**125**	**375**	500
III	19PM310	CC-X	Complex Analysis	6	5	25	75	100
	19PM311	CC-XI	Differential Geometry	6	4	25	75	100
	19PM312	CC-XII	Measure and Integration	6	5	25	75	100
	19PM313E	CEC-I	Elective Course I	6	4	25	75	100
	19PM313E	CEC-II	Elective Course II	6	4	25	75	100
	Total			**30**	**22**	**125**	**375**	**500**
IV	19PM414	CC-XIII	Functional Analysis	5	5	25	75	100
	19PM415	CC-XIV	Stochastic Processes	5	4	25	75	100
	19PM416E	CEC-III	Elective Course III	6	4	25	75	100
	19PM416E	CEC-IV	Elective Course IV	6	4	25	75	100
		CC-XV	PROJECT	8	5	25	75	100
	Total			**30**	**22**	**125**	**375**	**500**
GRAND TOTAL				**120**	**90**	**500**	**1500**	**2000**

Programme Educational objectives (PEO)

PEO 1: Technical Proficiency:

The program gives success in getting employment in different areas, such as Government, public and private sectors.

PEO 2: Professional Growth:

As mathematics is mother of all sciences, its impact is very wide covering all the areas of research and development.

PEO 3: Management Skills:

This program helps each individual in developing personality skills like time management, crisis management, stress management, interviews and working as a team and group.

PEO4: Ethical Skills:

This program makes the individual to understand and appreciate professional ethics, community living and Nation Building initiatives.

Program Outcome (PO)

PO1: Apply knowledge and principle of Mathematics, in all the fields of learning including higher research and the same to the needs of Employer/Institution/Society.

PO2: Gain analytical skills in the field of Mathematics.

PO3: Develop the logical thinking skills

PO3: Understand the concepts of real and complex analysis

PO4: Use the knowledge of pure and applied mathematics to solve complex mathematical problems

PO5: Innovate and invent novel ideas to model the real world problems.

PO6: Crack the exams approved by UGC namely CSIR – NET (JRF/Lectureship) and SET.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO 1: Connect Mathematics to real life problems in their lives. PSO 2: Do intensive research in pure and applied mathematics. PSO 3: Analyze problems of industry and society

PSO 4: Model and provide solutions to scientific and real life situations. PSO 5: Prepare for a career in which critical thinking is a central feature.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
Algebra	CO 1: understand Sylow's theorem and its applications and Galois theory and its applications CO 2: apply suitable methods to find the roots of the polynomials CO 3: analyze linear transformations. CO 4: evaluate characteristic roots of the matrix
Real Analysis-I	CO1: describe the concepts of sets and functions, metric spaces, continuity and connectedness. CO2: demonstrate on sequences and series. CO3: demonstrate on applying Baire Category Theorem, Banach Contraction Principle . CO4: analyze Cauchy sequences, complete metric spaces and connected metric spaces.
Ordinary Differential Equations	CO1: describe the methods of solving first and second order ODE and non linear autonomous system of ODE. CO2: understand the special functions of Mathematical Physics and the concept of stability and critical points of linear system of equations. CO3: evaluate the power series solution of ODE. CO4: demonstrate on applying Picard's theorem to find the solution of ODE's.
Integral Equation, Calculus of Variations and Fourier Transforms	CO1: solve the linear integral equations . CO2: find the solutions of Volterra and Fredholm integral equations. CO3: demonstrate on variational problems on moving boundaries and fixed boundaries. CO4: find the Fourier transform and Hankel transform of various functions.
Classical Dynamics	CO 1: understand the 3N-Coordinate system made up of N-Spatial coordinates, N-velocity coordinates and N-acceleration coordinates CO 2: analyze the motion of mechanical systems with constraints using Lagranian description CO 3: apply Hamilton's principle and gain proficiency in solving equations of motions CO 4: use the Hamilton-Jacobi theory in solving equations of otions
Linear Algebra	CO 1: apply the knowledge of bases and dimension of vector spaces and linear

	transformation. CO2: understand the operations on matrices, matrix of linear transformation and properties of determinant. CO3: evaluate the Eigen values and the Eigen vectors of linear transformations. CO4: demonstrate on applying the Jordan canonical forms to vector paces.
Real Analysis-II	CO1:know differentiation of single variables. CO2: acquire the knowledge of Riemann-Stieltjes integrals.and inverse function theorem CO3: demonstrate on the convergence and uniform convergence of sequence and series of functions CO4:evaluate directional derivative, total derivative, Jacobian of functions of several variables.
Topology	CO1: develop their abstract thinking skills CO2: provide precise definitions and appropriate examples and counter examples of fundamental concepts in general topology. CO3: acquire knowledge about various types of topological spaces and their properties CO4: appreciate the beauty of the mathematical results like Ury Zohn's Lemma and understand the dynamics of the proof techniques.
Partial Differential Equations	CO1: recollect the first order and second order partial differential equations and their solution. CO2: understand the linear partial differential equations with constant and variable coefficients, boundary value problems and application of calculus of variations. CO3: gain good knowledge in applying Charpit's and Jacobi's methods, method of separation of variables and the method of integrals to obtain solutions of partial differential equations. CO4: demonstrate on the canonical forms of second order PDEs and bounded value problems by Dirichlet and Neumann.
Complex Analysis	CO1: acquire the knowledge of analytic functions and Mobius transformation. CO2: understand the concept of complex integration. CO3: demonstrate on Cauchy theorems and open mapping theorem. CO4: classify the singularities and evaluate the residue
Differential Geometry	CO1: understand the concept of Graphs and Level sets-Vector fields CO2: analyze surfaces and Vector field on surfaces CO3: understand Gauss map-Geodesics. CO4: apply Parallel Transport and Weingarten map.
Measure Theory and Integration	CO 1: acquire the concept of Lebesgue measure, measurable set. CO 2: understand the concept of integration of non negative functions. CO 3: demonstrate on Jenson's inequality and Hahn decomposition theorem and Fubini's theorem. CO 4: analyze the properties of L^p spaces.

Functional Analysis	CO1: understand the concept of Normed Spaces CO2: apply the idea of linear operators and compact operators CO3: evaluate Ortho normal basis CO4:.demonstrate spectral theory
Stochastic Processes	CO1: understand the concept of various specifications of Stochastic Processes. CO2: apply the idea of Markov chain and Markov Processes to real life problems. CO3: demonstrate on renewal equation, stopping time and renewal theorem. CO4:apply the idea of queuing model to real life problems .
Number Theory	CO1: attain a broad understanding of divisibility, congruence, greatest common divisor, least common multiple and factoring. CO2: understand certain number theoretic functions and their properties. CO3: apply the law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues and quadratic non- residue. CO4: acquire the mathematical skills required to solve the system of Diophantine equation using Chinese Reminder theorem and Euclidean algorithm.
Fuzzy Mathematics	CO1: to know the basic Mathematical elements of the theory of fuzzy sets CO2: gain Knowledge about the fuzzy arithmetic and fuzzy number CO3: to understand the difference and similarities between fuzzy sets and classical set theories. CO4: apply the fuzzy logic in real life situation
Graph Theory	CO1: understand the definitions namely, cut vertex, bridge, blocks and automorphism group of a graph. CO2: study the properties of trees and connectivity. CO3: identify Eulerian graphs and Hamiltonian graphs. CO4: understand the concepts planarity including Euler identity, matching's and colorings.
Numerical Analysis	CO 1: obtain the solutions of transcendental and polynomial equations. CO 2 : apply direct methods and iteration methods for solving system of equations. CO 3 : apply Hermit interpolation, piecewise and spline interpolation. CO 4 : solve problems using interpolation and ordinary differential equations using numerical methods.
Optimization Techniques	CO1: understand the concept of integer programming and dynamic programming. CO2: analyze the problems based on decision theory and game theory. CO3: get optimize inventory models. CO4: evaluate non-linear programming problems.
Probability Theory	CO1: acquire the knowledge of random variables, distribution. CO2: understand the concept of expectation, characteristics function. CO3: demonstrate on Chebyshev inequality and various distributions CO4: apply limit theorems to analyze stochastic convergence.

Coding Theory	CO1: apply linear block codes for error deduction and correction.. CO2: understand the importance in the design of codes. CO3: apply the tools of linear algebra to construct special type of codes. CO4: use algebraic techniques in designing coefficient and reliable data transmission methods.
Fluid Dynamics	CO1: understand the behavior of fluids in motion. CO2: understand the potential theorems of fluid flow CO3: apply the concept of complex analysis in the analysis of the flow of liquids. CO4: analyze the concept of sources, sinks & doublets and two dimensional flows.
Mathematical Modeling And Simulation	CO 1: acquire the role of discrete and continuous distributions in simulation CO 2:understand the steady state behavior of queuing models CO 3: evaluate the performance measures of queuing system CO 4: demonstrate on random number and variety generation
Statistics	CO 1: represent data diagrammatically CO 2: evaluate measures of dispersion CO 3: apply correlation and regression analysis CO 4: demonstrate on analysis of variance

B.Sc., PHYSICS (UG) COURSE STRUCTURE UNDER CBCS PATTERN

SEM	Part	Course Title	Sub Code	Hrs/ Week	Credit	Marks		Total
						IA	EA	
I	I	Tamil	19T101	6	3	25	75	100
	II	English	19H101	6	3	25	75	100
	III	CC-I-Mechanics	19P101	5	4	25	75	100
		CC-II Major Practical-I	19P102L	3	-	-	-	-
		AC-I-Allied Mathematics-I	19P103A	4	4	25	75	100
		AC-II-Allied Mathematics –II	19P104A	4	4	25	75	100
	IV	VE-Value Education	19VED	2	2	25	75	100
II	I	Tamil	19T202	6	3	25	75	100
	II	English	19H202	6	3	25	75	100
	III	CC-II*- Major Practical-I	19P102L	3	4	40	60	100
		CC-III- Properties of matter and sound	19P205	6	5	25	75	100
		AC-III- Allied Mathematics –III	19P206A	5	4	25	75	100
	IV	Environmental studies	19EVS	2	2	25	75	100
		SKBC-I- Testing of Electronic Components (Lab Only)	19XP21	2	2	25	75	100
III	I	Tamil	19T303	6	3	25	75	100
	II	English	19H303	6	3	25	75	100
	III	CC-IV-Thermal Physics	19P307	5	5	25	75	100
		CC-V*- Major Practical-II	19P308L	3	-	-	-	-
		AC-IV-Allied Chemistry-I	19P309A	5	4	25	75	100
		AC-V*-Allied Chemistry Practical	19P310L	3	-	-	-	-
	IV	SKBC-II-Mini Project	19XP32	2	2	25	75	100
	V	GENDER STUDIES	19GS	-	1	25	75	100
IV	I	Tamil	19T404	6	3	25	75	100
	II	English	19H404	6	3	25	75	100
	III	CC-V*- Major Practical-II	19P308L	3	4	40	60	100
		CC-VI-Optics	19P411	5	5	25	75	100
		AC-V*-Allied Chemistry Practical	19P310L	3	4	40	60	100
		AC-VI- Allied Chemistry-II	19P412A	5	4	25	75	100
	IV	NMEC-I Bio Physics	19P4N1	2	2	25	75	100
		Soft Skill Course	19SSC	0	2	25	75	100
V	III	CC-VII*- Major Practical-III	19P513L	3	-	-	-	-
		CC-VIII*- Major Practical IV	19P514L	3	-	-	-	-
		CC-IX- Electricity and Magnetism	19P515	6	5	25	75	100
		CC-X- Atomic and Nuclear Physics	19P516	5	4	25	75	100
		CC-XI- Fundamentals of Electronics	19P517	6	5	25	75	100
		EC-I – Select from EC-I list	19P518	5	5	25	75	100
		NMEC-II – Energy Physics	19P5N2	2	2	25	75	100
VI	III	CC-VII*- Major Practical-III	19P513L	3	5	40	60	100
		CC-VIII*- Major Practical IV	19P514L	3	5	40	60	100
		CC-XII-Quantum Mechanics and Relativity	19P619	6	5	25	75	100
		CC-XIII-Solid State Physics	19P620	6	5	25	75	100
		EC-II- Select from EC-II list	19P621	6	5	25	75	100
		EC-III- Select from EC-III list	19P622	6	5	25	75	100
	VI	EXTENSION ACTIVITIES	19EA		1			
		Grand total		**180**	**140**	**1025**	**2775**	**3800**

Programme Objectives:

- The objectives of the undergraduate programme in Physics are designed to the students who will be able to succeed in obtaining employment appropriate to their interest in Physics.
- The degree course in Physics will make them productive and create a valuable professional.
- In addition, they will continue to develop professional skills through life-long learning.
- Additionally we inculcate inclination for higher education and to pursue research appropriate to the local needs.
- Exercise leadership qualities in a responsive, ethical, and innovative manner

Programme Specific Outcomes:

- Read understands and interprets physical information by verbal, Mathematical, and graphical methods.
- Impart skills required to gather information from resources and use them.
- Provide need based education in physics of the highest quality at the undergraduate level.
- Offer courses to the choice of the students.
- Perform experiments and interpret the results of observation, including assessing experimental uncertainties.
- Provide an intellectually stimulating environment to develop skills and Menthusiasms of students to the best of their potential.
- Use Information Communication Technology to gather knowledge at will.
- Attract outstanding students from all backgrounds.

Programme Learning Outcomes

- Students will have a firm foundation in the fundamentals and application of current scientific theories in optics, nuclear physics, digital electronics, and computer programmes.
- Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.
- Students will be skilled in problems solving, critical thinking, and analytical reasoning as applied to scientific problems.
- Students will be able to clearly communicate the results of scientific work in oral written and electronic formats to both scientific community and to the public.
- Students will be able to explain how the physics concepts are helpful for addressing social, economic, and environmental problems.
- Students will be able to prepare themselves for employment in industries, government or to pursue graduate work toward such advanced degrees as the M.Sc., or Ph.D. in various areas of Physics

Course Outcomes(Cos)

Name of the Course	Course Outcomes
Mechanics	Co 1 : Students can realize the motion of an object in gravitational field. Co 2 : They will be able to understand the role of moment of inertia of an object in its rotational motion. CO 3 : The gravitational force and its influence in our everyday life could be understood CO4 : To understand the atmospheric pressure and its variation with altitude. CO 5 : To study the Kepler's laws of planetary motions, Newton's law of gravitation.
Major Practical-I	CO 1 : Use effectively optical instruments like microscope and telescope. CO 2 : Also they would develop the skill of taking the readings in experiments for heat, sound, light. CO 3: Student will get the knowledge on determining various constants and presentation skill in the form of record note submission.
Properties of Matter and Sound	CO1: The students gain the knowledge on elastic behavior of solids. CO2: Students are able to apply their knowledge on elastic properties to beams. CO3: Students are able to evaluate the behavior of liquids with respect to surface tension and viscosity. CO4: Students gain the knowledge on SHM, reverberation. CO5: The students could know the technique of the production and uses of ultrasonic.
THERMAL PHYSICS	CO 1: Demonstrate knowledge-based competencies in the fields of Thermodynamics and Statistical Mechanics, CO 2: Keynotes of Classical and Quantum Statistical Physics. CO 3: Also Students will demonstrate a mastery of the core knowledge base expected of Physics professionals in areas of Thermal Physics. CO 4: To understand the Debye Theory CO 5: To grasp the concepts Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac distribution laws.

SKBC II **Mini Project(Group Project)**	CO 1: Students acquire the focused attention on a particular task in a stipulated time. CO 2: Students could develop the organizational skill and leadership quality. CO 3: Students will get the exposure on the outside world for checking the availability of CO 4: Components and means of purchasing the quality products with
Major Practical-II	CO 1: Use effectively optical instruments like microscope and Telescope. CO 2: Also they would develop the skill of taking the readings in Experiments for heat and light. CO 3: Student will get the knowledge on determining various constants and presentation skill in the form of record note submission.
OPTICS	CO 1:Describe the types of lenses and classify various defects occurs in lens CO 2: Demonstrate the application of light and various optical devices CO 3: Identify and analyze the optical phenomenon like interference, diffraction and polarization. CO 4: To gain skill Fresnel's diffraction at a straight edge and circular aperture CO 5: To apply the elliptically and circularly polarized light.
NMEC-I **BIO PHYSICS**	CO 1: The students should be able to interpreting elastic nature of muscles and its bio motion. CO 2: The knowledge of chromatography could be understood. CO 3: The students are able to analyses glucose transport into the intestinal. CO 4: To learn bio energetic of coupled reactions ,photo synthesis, membrane transport ,membrane permeability CO 5: To apply the electrocardiogram, arterial blood pressure, electrical activity of the heart, pumping activity of heart

ATOMIC AND NUCLEAR PHYSICS	CO 1:Students will be able to describe theories explaining the structure of atoms and the origin of the observed spectra. CO 2: And also they can able to identify atomic effect such as Zeeman Effect and Stark effect. CO 3:They would be summarizing different types of atomic spectra. CO 4: They should be able to explain the observed dependence of atomic spectral lines on externally applied electric and magnetic fields. CO 5: They can analyze nuclear reaction and their application.
FUNDAMENTALS OF ELECTRONICS	CO 1: Students should be able to analysis resistive circuits and working of diodes. CO 2: They can be able to design amplifier and oscillator circuits. CO 3: Students can also construct the circuits that provide mathematical operations and multi vibrations. CO 4: To apply the single stage RC coupled amplifier. CO 5: To apply the Sub tractor ,Integrator ,Differentiator, D/A converter, Binary weighted method.
ELECTRICITY AND MAGNETISM	CO 1: The use of Coulomb's law and Gauss' law for the electrostatic force CO2 : The relationship between electrostatic field and electrostatic potential CO 3: The use of Faraday's law in induction problems CO 4: The basic idea of transient and alternating current CO 5: To apply the Discharge of a capacitor through an Inductor and Resistor in series LCR circuit.
NMEC-II Non-conventional Energy Resources	CO 1: Describe the environmental aspects of non-conventional energy resources, CO 2: Know the necessity of renewable energy resources, CO 3: Appreciate the need of solar energy, Wind Energy and the various components used in energy generation and know the classifications, CO 4: Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications, CO 5: Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations, Acquire the knowledge of geothermal principles and applications.

PYTHON PROGRAMMING	CO 1: Students should be able to master an understanding of scripting and the contributions of scripting languages. CO 2: They could be master an understanding of Python especially the object-oriented concepts. CO 3: They should also be master an understanding of the built in objects of Python CO 4: To grasp the concepts Inheritance, Special Methods, Data Hiding CO 5: To inculcate Exception Defining clean Up Actions.
Communication Electronics	CO 1: After the completion of the course the student will be able to acquire knowledge in modulations. CO 2: They are also able to know the different types communication like satellite, fiber, and telephone systems. CO 3: To understand the satellite communications system. CO 4: To inculcate the Fiber optic communications. CO 5: To gain knowledge the cellular Telephone System and paging systems
DIGITAL ELECTRONICS	CO 1:Identify the function of digital devices CO 2:Describe the needs of static and dynamic charges and prepare to design electrical devices for storing it CO 3:Write down the evolution of digital technology CO 4:Identify the basic hardware components and assess its function CO 5:To apply the Binary up-down counter.
MICROPROCESSOR AND ITS APPLICATIONS	CO 1: Write programs to run on 8085 microprocessor based systems and Design system using memory chips and peripheral chips for 8 bit 8085 microprocessor. CO 2: Also students will be able to understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors CO 3: To apply the largest number and smallest number in a data array, Sum of N numbers, Multiplication. CO 4: To apply the Counter/Timer. CO 5: To apply the Interfacing of 7-Segment LED display (Display of decimal numbers)

QUANTUM MECHANICS AND RELATIVITY	CO 1:Students will be able to connect a theory with the corresponding experiment. CO 2:Students will be able to understand the necessary and development of quantum mechanics. CO 3:Ability will be gained by the students in understanding various concepts in relativistic theory. CO 4: To grasp the concept the application of Schrödinger's equation time independent form . CO 5: to understand the special theory of relativity – postulates – Lorenz transformation equations.
SOLID STATE PHYSICS	CO 1: To get through understanding of the crystal lattice and its types. CO 2: An insight into the Bragg's law and its importance. CO 3: Prepare an account of various defects in a crystal. CO 4: Gain the knowledge on magnetic, dielectric, semiconducting and superconducting materials. CO 5: Able to discuss the exotic properties of solids at the nano-scale and CNT and uses Also they would be able to perform structure determination of simple structures.
EC-III 8051 MICROCONTROLLER ARCHITECTURE AND PROGRAMMING	CO 1: Explain the need of microcontroller CO 2: Describe architecture and operation of microcontroller 8051 CO3: Develop assembly language programs using instruction set of 8051 CO 4: Develop programs using I/O port CO 5: Timers and serial ports
Major Practical-IV	CO 1**:** The students are able to handle the optical instruments like capacitor, coil, and resistor. CO 2: Also they would develop the skill of taking the readings in experiments based on electrical and light. CO 3: They should also able to get knowledge in digital devices. CO 4: Student will be able to write program using 8085 microprocessor.
ALLIED PHYSICS –I for Mathematics	CO :1 Identify the properties of solid , liquid and gas CO :2 Analyze scalar and vector parameters in physics CO :3 Describe the dynamics of planets and objects under various gravitational forces CO :4 Apply and analyze the properties of optical range for industrial and research developments CO :5 To learn the physical optics

ALLIED PHYSICS – II (For B.Sc., Mathematics Students)	CO:1 Identify the function of digital devices Co:2 Describe the needs of static and dynamic charges and prepare to design electrical devices for storing it Co:3 Write down the evolution of digital technology Co:4 Identify the basic hardware components and assess its function Co:5 To apply Universality of NAND and NOR gate.
ALLIED PHYSICS –I (For B.Sc., Chemistry Students	CO 1: Identify the properties of solid , liquid and gas CO 2: Analyze scalar and vector parameters in physics CO 3: Describe the dynamics of planets and objects under various gravitational forces CO 4:Apply and analyze the properties of optical range for industrial and research developments CO 5: To Understand the Interference in thin films.
AC-III ALLIED PHYSICS – II (For B.Sc., Chemistry Students)	CO:1 Identify the function of digital devices Co:2 Describe the needs of static and dynamic charges and prepare to design electrical devices for storing it Co:3 Write down the evolution of digital technology Co:4 Identify the basic hardware components and assess its function Co:5 To apply Universality of NAND and NOR gate.
AC-II ALLIED PHYSICS –I (For B.Sc., Mathematics (I Semester) and Chemistry (III Semester) Students)	CO 1: Understand the concepts and use research equipment (microscope, oscilloscope, etc.) CO 2 : Work independently and function as a team. CO 3: Develop communication skills (oral, graphic and written). CO 4: Apply a methodology for materials selection to scientific problems.

APPLIED PHYSICS – I	CO 1: Students should be able to apply the idea of transistors CO 2: Students can be evaluating the electronic devices for specific applications. CO 3: Students can be able to perform various conversion processes in digital electronics. CO 4: They can analyze and design various combinational and sequential circuits. CO 5: They learn the combinational circuits.
AC-III APPLIED PHYSICS – II **(For B.Sc., Computer Science Students)**	CO 1: Understand the basic working of 8051, which is the basic of all microcontroller CO2: Know the working nature of microcontroller architecture, and programming techniques. CO 3:Know the fundamentals of port programming and interfacing techniques CO 4:Learn the techniques of serial port programming in 8051 and on interrupts. CO 5:To apply 8051 Interrupts for the Programming.
APPLIED PHYSICS PRACTICAL– II (For B.Sc., Computer Science Students- 2019 onwards	CO 1: Understand the concepts and use research equipment (microscope, oscilloscope, etc.) CO 2: Design and conduct experiments that probe materials properties. CO 3: Work independently and function as a team. CO 4: Develop communication skills (oral, graphic and written).

Department of M.Sc., Physics (PG)

Sem.	Course Code	Title of Course	Inst. Hours/ Week	Credits	Marks		
					Int.	Ext.	Total
I	15PP101	CC-I Mathematical Physics - I	6	5	40	60	100
	15PP102	CC-II Classical Dynamics and Special Relativity	6	5	40	60	100
	15PP103	CC-III Analog and Digital Electronics	6	5	40	60	100
	15PP104	CC-IV Instrumentation Techniques	6	5	40	60	100
	15PP205L	CC-V Practical –I General Physics and Computer Programming*	3	--	--	--	--
	15PP206L	CC-VI Practical –II Electronics and Instrumentation*	3	--	--	--	--
II	15PP205L	CC-V Practical –I General Physics and Computer Programming*	3	4	40	60	100
	15PP206L	CC-VI Practical –II Electronics and Instrumentation*	3	4	40	60	100
	15PP207	CC- VII Mathematical Physics - II	6	5	40	60	100
	15PP208	CC-VIII Electromagnetic Theory	6	5	40	60	100
	15PP209	CC-IX Quantum Mechanics	6	5	40	60	100
	15PP210	OEC- Microcontroller and Its Applications	6	4	--	100	100
III	15PP311	CC-X Statistical Mechanics	6	5	40	60	100
	15PP312	CC-XI Nuclear and Particle Physics	6	5	40	60	100
	15PP313L	CC-XII Practical – III Advanced General Physics*	3	--	--	--	--
	15PP314L	CC-XIII Practical – IV Digital Electronics and Microcontroller Programming*	3	--	--	--	--
	15PP315	CEC-I Atomic and Molecular Physics	6	4	40	60	100
	15PP316	CEC-II Crystal Growth and Thin films	6	4	40	60	100
IV	15PP313L	CC-XII Practical – III Advanced General Physics*	3	4	40	60	100
	15PP314L	CC-XIII Practical – IV Digital Electronics and Microcontroller Programming*	3	4	40	60	100
	15PP416	CC- XIV Solid State Physics	6	4	40	60	100
	15PP417	CEC-III Electronic Communication Systems	6	4	40	60	100
	15PP418	CEC- IV Nano Science	6	4	40	60	100
		CC-XV-Project Work	6	5	40	60	100
			120	90	Total Marks		2000

Programme Outcome

The Master of Science in Physics programme provides the candidate with knowledge, general competence, and analytical skills on an advanced level, needed in industry, consultancy, education, research, or public administration.

The work with the Master Dissertation gives special expertise within one of the research areas represented at the Department of Physics: Theoretical, Material Science, Nano Science and Particle Physics and Modern Field Theory, Biophysics and Condensed Matter Physics, and Physics Education and Dissemination.

Knowledge

The candidate

- has substantial knowledge in physics, basic knowledge in mathematics, and knowledge in supported fields like computer science.
- has some research experience within a specific field of physics, through a supervised project (the Master Dissertation).
- has advanced knowledge in some areas in physics.
- is familiar with contemporary research within various fields of physics.

Skills

The candidate

- has the background and experience required to model, analyse, and solve advanced problems in physics.
- is able to apply advanced theoretical and/or experimental methods, including the use of numerical methods and simulations.
- can combine and use knowledge from several disciplines.
- can critically and independently assess and evaluate research methods and results.
- has the ability to develop and renew scientific competence -- independently, via courses or through PhD studies in physics or related disciplines.
- is able to enter new problem areas that require an analytic and innovative approach.
- can disseminate subject matter and results to both specialists and a broader audience.

General competence

The candidate

- understands the role of physics in society and has the background to consider ethical problems.
- knows the historical development of physics, its possibilities and limitations, and understands the value of lifelong learning.
- is able to gather, assess, and make use of new information.
- has the ability to successfully carry out advanced tasks and projects, both independently and in collaboration with others, and also across disciplines.
- has an adequate background for pursuing pedagogic education.
- has an international perspective on her/his discipline.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
MATHEMATICAL PHYSICS-I	• The students will be able to understand and apply the mathematical skills to solve quantitative problems in the study of physics. • Learn about Gradient, Divergence and Curl in orthogonal curvilinear and their typical applications in physics. The students should be able to formulate and express a physical law in terms of vectors, and simplify it by use of coordinate transforms. • Learn different ways of solving second order differential equations and familiarized with singular points and Frobenius method. • Learn the fundamentals and applications of Fourier series, Fourier and Laplace transforms,their inverse transforms etc. Will enable students to apply integral transform to solve mathematical problems of interest in physics. The students will be able to use Fourier transforms as an aid for analyzing experimental data.Get introduced to Special functions like Gamma function, Beta function, Bessel functions and their recurrence relations. • To become familiar with the method of Green's function to solve linear differential equations with inhomogeneous term.

CLASSICAL DYNAMICS AND SPECIAL RELATIVITY	• Solve the simple physical system using all the three formalisms. • Realize the physical concepts involved in rigid body dynamics. • Apply special theory of relativity to elementary particles
ELECTRONICS AND INSTRUMENTATION	• The students will understand the working principles of various electronic devices, circuits, optoelectronic devices, electronic instrumentation and nonlinear circuits.
PIC MICROCONTROLLER AND APPLICATIONS	• Understand the basic working of PIC Microcontroller • Understand and apply the fundamentals of assembly programming for microcontroller. • Get comprehensive knowledge on the interrupts and timers • Understand the significance of input-output device interface • Able to design a project or product with microcontroller
MICROCONTROLLER PROGRAMMING LAB	• Understand the real concept of interfacing • Work on different projects making use of the PIC microcontroller • Able to solve some mathematical expressions using microcontroller • Design of real time systems
MATHEMATICAL PHYSICS-II	• The students will be able to understand and apply the mathematical skills to solve quantitative problems in the study of physics. • Know the method of contour integration to evaluate definite integrals of varying complexity. • Learn about special type of matrices that are relevant in physics and then learn about tensors. • Have gained ability to apply group theory to physics problems, which is a pre-requisite for deeper understanding of crystallography, particle physics, quantum mechanics and energy bands in solids.

STATISTICAL MECHANICS	• Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics. • Apply the principles of statistical mechanics to selected problems. • Grasps the basis of ensemble approach in statistical mechanics to a range of situations. • To learn the fundamental differences between classical and quantum statistics and learn about quantum statistical distribution laws. • Study important examples of ideal Bose systems and Fermi systems.
QUANTUM MECHANICS	• Familiarize with the postulates of quantum mechanics • Understand the operator formalism • Solve the Schrodinger equation of simple systems
COMPUTATIONAL METHODS	• develop C++ programs for numerically solving problems • derive computational methods and error analysis for various mathematical operations and tasks • make an appropriate curve fit for a given data set; • apply appropriate algorithm for interpolating data and value of a function; • understand and apply methods of constructing solutions of system of linear equations; • familiar with numerical integration and differentiation of functions.
ELECTROMAGNETIC THEORY	• To explain and solve advanced problems based on classical electrodynamics using Maxwell's equation. • The students will be able to analyze s radiation systems in which the electric dipole, magnetic dipole or electric quadruple dominate. • The students will have an understanding of the covariant formulation of electrodynamics and the concept of retarded time for charges undergoing acceleration. • Learn various concepts of electromagnetic waves.

SOLID STATE PHYSICS	• Structures in solids and their determination using XRD. • Behavior of electrons in solids including the concept of energy bands and effect of the same on material properties. • Electrical, thermal, magnetic and dielectric properties of solids. • The students will be able to formulate basic models for electrons and lattice • vibrations for describing the physics of crystalline materials; • and develop an understanding of relation between band structure and the electrical/optical properties of a material.
ATOMIC AND MOLECULAR PHYSICS	• Atomic spectroscopy of one and two valance electron atoms. • The change in behavior of atoms in external applied electric and magnetic field. • Rotational, vibrational, electronic and Raman spectra of molecules. • Electron spin and nuclear magnetic resonance spectroscopy. • Quantum behavior of atoms in external electric and magnetic fields; and become familiar with the working principle of laser.
CRYSTAL GROWTH AND THIN FILMS	• Nucleation mechanisms and different kinds of nucleation • important crystal growth techniques like (Bridgman, Czochralski (Pulling method),solution growth, gel ,flux and hydrothermal methods) • gain in depth knowledge on thin films growth methods of Physical and chemical. • Understanding of various characterization techniques of a) Powder and Single crystal XRD b) FTIR, c) UV-Visible and PL, d) micro hardness e) SEM and TEM
NUCLEAR AND PARTICLE PHYSICS	• The students will have an understanding of the structure of the nucleus, radioactive decay, nuclear reactions and the interaction of nuclear radiation with matter; and develop an insight into the building block of matter along with the fundamental interactions of nature. • After successful completion of the course, the student is expected to

	• Have a basic knowledge of nuclear size, shape, bindingenergy.etc and also the characteristics of nuclear force in detail. • be able to gain knowledge about various nuclear models and potentials associated. • Acquire knowledge about nuclear decay processes and their outcomes. Have a wide • understanding regarding beta and gamma decay. • Grasp knowledge about Nuclear reactions, Fission and Fusion and their • characteristics. Understand the basic forces in nature and classification of particles • and study in detail conservations laws and quark models in detail • Weak interaction between quarks and how that this is responsible for β decay. . • Leptons and how the (electron) neutrinos and (electron) antineutrinos are produced • during β+ and β- decays respectively.
ELECTRONIC COMMUNICATION SYSTEMS	• Optical fiber communication. • Satellite communication and mobile communication.
NANOSCIENCE	• Preparation of nanoparticles and nanomaterials. • Quantum computers, MEMS and NEMS.

Department of B.Sc., Zoology (UG)

Semester	Part	Course Title	Hrs/ week	Credits	Exam Hrs.	Marks		Total
						Int.	Ext.	
I	I	Tamil – I	6	3	3	25	75	100
	II	English – I	6	3	3	25	75	100
	III	Core Course-I (CC): Invertebrata	5	5	3	25	75	100
		Core Course-II (CC): Practical – I: Invertebrata	3	2	3	40	60	100
		Allied Course –I (AC): Botany	5	4	3	25	75	100
		Allied Course –II (AC): Botany Practical	3	-	*	-	-	-
	IV	Value Education	2	2	3	25	75	100
		Total	**30**	**19**	**-**	**-**	**-**	**600**
II	I	Tamil – II	6	3	3	25	75	100
	II	English – II	6	3	3	25	75	100
		Core Course-III (CC): Chordata	4	4	3	25	75	100
	III	Core Course-IV (CC): Practical-II: Chordata	3	2	3	40	60	100
		Allied Course –II (AC): Botany Practical	3	4	3	40	60	100
		Allied Course –III (AC): Botany	4	4	3	25	75	100
		$Skill Based Course-I	2	2	3	25	75	100
		Environmental Studies	2	2	3	25	75	100
		Total	**30**	**24**	**-**	**-**	**-**	**800**
III	I	Tamil -III	6	3	3	25	75	100
	II	English -III	6	3	3	25	75	100
	III	Core Course – V (CC): Cell Biology	5	5	3	25	75	100
		Core Course – VI (CC): Practical-III: Cell Biology	3	2	3	40	60	100
		Allied Course – IV (AC): Chemistry	5	4	3	25	75	100
		Allied Course – V (AC): Chemistry Practical	3	-	*	-	-	-
	IV	$Skill Based Course-II	2	2	3	25	75	100
		Gender Studies (self-study course)	0	1	3	-	100	100
		Total	**30**	**20**	-	-	-	**700**
IV	I	Tamil – IV	6	3	3	25	75	100
	II	English – IV	6	3	3	25	75	100
	III	Core Course –VII (CC): Animal Physiology	5	5	3	25	75	100
		Core Course –VIII (CC): Practical –IV: Animal Physiology	3	2	3	40	60	100
		Allied Course – V (AC): Chemistry Practical	3	4	3	40	60	100
		Allied Course –VI (AC): Chemistry	5	4	3	25	75	100
	IV	*NMEC-I	2	2	3	25	75	100
		Soft Skill (self study course)	0	2	3	-	100	100
		Total	**30**	**25**	**-**	**-**	**-**	**800**

Semester	Part	Course Title	Hrs/ week	Credits	Exam Hrs.	Internal marks	External marks	Total
V	III	Core Course – IX (CC): Developmental Biology	6	5	3	25	75	100
		Core Course – X (CC): Environmental Biology	6	5	3	25	75	100
		Core Course – XI (CC): Immunology	5	4	3	25	75	100
		Core Course – XII (CC): Practical –V: Developmental Biology, Environmental Biology and Immunology.	6	5	3	40	60	100
		#Major Based Elective Course –I (MBEC)	5	5	3	25	75	100
	IV	*NMEC–II	2	2	3	25	75	100
		Total	**30**	**26**	**-**	**-**	**-**	**600**
VI	III	Core Course – XIII (CC): Genetics and Evolution	6	5	3	25	75	100
		Core Course – XIV (CC): Biotechnology and Bioinformatics	6	5	3	25	75	100
		Core Course – XV (CC): Practical –VI: Genetics, Evolution, Biotechnology and Bioinformatics	6	5	3	40	60	100
		#Major Based Elective Course – II (MBEC)	6	5	3	25	75	100
		#Major Based Elective Course – III (MBEC)	6	5	3	25	75	100
	IV	Extension Activities	-	1	-	-	-	-
	IV	Comprehensive Course (Self-study course)	0	4	3	-	100	100
	IV	$SKBC-III (Self-study course)	0	2	3	-	100	100
		Total	**30**	**32**	**-**	**-**		**700**
		Over all Total (Including self study)	180	**146**				**4200**

Programme Educational Objectives (PEO)

1. To succeed in obtaining employment opportunities appropriate to their interest in Zoology related fields and to harness skills to critically asses, analyze and solve problems related to life science.
2. To continue to develop their professional career through life-long learning and to pursue higher education in their areas of interest.
3. To motivate the students to excel in their academic activities.
4. To promote leadership qualities and moral values through ethical ways with the concern for the society and the environment
5. To cater the students to the needs of the industry/ society so as to contribute for the development of the country.

Program Outcome (PO)

1. Apply the principles that they learnt to the needs of the Employer/ Institution/Enterprise/Society.
2. Gain analytical skills in the fields/areas of Zoology.
3. Understand and appreciate professional ethics, community living and Nation Building initiatives.
4. Apply the knowledge of various branches of Zoology and General biology meant both for a graduate terminal course and for higher studies.
5. Understand the unity of life with the rich diversity of organisms and their ecological and evolutionary significance.
6. Acquire basic skills in the observation and study of nature, biological techniques, experimental skills and scientific investigation.
7. Acquire basic knowledge and skills in certain applied branches to enable them for self-employment.
8. Impart awareness of the conservation of the biosphere.
9. Develop positive attitude towards sustainable development

PROGRAMME SPECIFIC OUTCOME (PSO)

1. Apply the knowledge of Zoology in the domain of Biological Science.
2. Solve the complex problems in the field of Zoology such as global warming, pollution and decreasing of animal population with an understanding of the societal, legal and cultural impacts.
3. Get concrete ideas of classification of invertebrate phyla and vertebrate classes and to become familiar with the dissection of some specific invertebrates and vertebrate animals**.**
4. Understand the life at cellular level and know the mechanism of cell cycle in normal and cancerous cells.
5. Know detailed information on physiology of various organ-systems and their importance to the integrative functions of the human body.
6. Apply their understanding on embryonic development, reproductive function and assisted reproductive technologies to circumvent infertility and contraceptive methods.
7. Demonstrate an understanding of ecological relationships between organisms and their environment.
8. Perform procedure as per laboratory standards in the areas of Biochemistry, Bioinformatics, Economic zoology and Ecology.
9. Appreciate the process of evolution and see how it progressed from simple, unicellular cells to complex, multi cellular organisms.
10. Understand the roles of antigens, antibodies and immune competent cells in pathogenesis and immunity to infectious diseases and to apply the immune techniques for mitigating diseases occurrence/curing them.
11. Recognize the scope of microbiology and to identify disease causing pathogenic microbes and their prevention and treatments.
12. Familiarize with genetic engineering techniques, biotechnology products, public policy, bio safety, and intellectual property rights issues related to biotechnology.
13. Apply knowledge of various applications of bioinformatics tools.
14. Apply the knowledge of pest management.
15. Understand importance of wild life protection and conservation.
16. Apply knowledge obtained from poultry science, dairy farming, apiculture, sericulture and aquaculture and to become an entrepreneur
17. Aware of personal and public health care.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
CC-I: INVERTEBRATA	• Understand the fascinating world of invertebrates and get a concrete idea of classification of invertebrate phyla. • Understand the basics of systematic of various groups of invertebrate phyla. • Describe the structure and physiology of invertebrates with typical examples in each phylum. • Know the economic importance of invertebrates • Explain the taxonomic and characteristic features of minor phyla (Rotifer).
CC-II: PRACTICAL-I: INVERTEBRATA	• Familiar with dissection of invertebrates. • Describe the morphological and anatomical structure of invertebrates. • Understand various systems of invertebrates.
CC-III: CHORDATA	• Inculcate the fascinating vertebrate life. • Learn the evolution, hierarchy and classification of different classes of chordates • Get an overview of the morphology and physiology of typical examples of chordates. • Familiarize the adaptations and economic importance of specific vertebrates
CC-IV: PRACTICAL-II (CHORDATA)	• Familiarize with dissection of vertebrate animals. • Understand various systems of vertebrates.
SKBC-I: APICULTURE	• Explain the morphology, colony organization and life cycle of honey bees. • Identify different species of wild honey bees and suitable species for apiculture. • Familiar with the beekeeping equipments and method of honey harvesting. • Realize the nutritional and medicinal values of honey. • Explain the values and production of bee products. • Apply the knowledge of apiculture to become an entrepreneur.

ENVIRONMENTAL STUDIES	• Develop deeper understanding of what life is and how it functions at cellular level. • Compare the structure of eukaryotic cells with the structure of simpler prokaryotic cells. • Describe cellular membrane structure and function, fine structure and function of cell organelles. • Explain the cell division in somatic and germ cell. • Discuss the mechanisms of cell cycle in normal and cancer cell. • Explain the structure and function of the genetic material and its types. • Describe the structural organization of genes and the control of gene expression. • Understand the protein synthesis.
CC-VI: PRACTICAL-III: CELL BIOLOGY	• Observe chromosomal arrangements during cell division • Distinguish different cells and tissues. • Familiarize with conventional and modern cytological techniques.
POULTRY FARMING AND DAIRY FARMING	**Poultry Farming:** • Identify and selection of breeds of fowl. • Plan a housing unit for breeding and rearing of fowls. • Describe feed types and feeding of poultry. • Analyze the poultry diseases and apply disease management techniques. • Understand the nutritive value of eggs and meat. • Apply knowledge obtained from poultry science to become an entrepreneur. **Dairy farming:** • Identify the breeds of cattle. • Understand the breeding and cattle improvement programme in India. • Analyze the pests and diseases of dairy cattle and apply their management methods. • Understand the byproducts of dairy farming. • Apply knowledge obtained from dairy farming to become an entrepreneur.

CC-VII: ANIMAL PHYSIOLOGY	• Understand the importance of Bio molecules. • Familiar with various biochemical pathways. • Analyze structural-functional relationships of proteins. • Understand the structure and function of various systems. • Apply the knowledge to lead a healthy life.
CC-VIII: PRACTICAL-IV: ANIMAL PHYSIOLOGY	• Demonstrate basic principles in physiology. • Develop skill in simple biochemical laboratory procedures. • Analyze blood samples.
NMEC-I: Entrepreneurial Zoology	• Identify various methodology and perspectives of applied branches of zoology for the possibilities of self-employment. **Aquaculture:** • Plan a set-up of fish farm. • Describe basic culture methodologies, common problems and solutions of commercially important fishes. **Poultry Farming:** • Explain the breeds of fowls and selection of breed. • Plan a housing unit for breeding and rearing of fowls. • Describe feed types and feeding of poultry. • Analyze the poultry diseases and apply disease management techniques. **Dairy farming:** • Explain the breeds of cattle. • Understand the breeding and cattle improvement. **Apiculture:** • Understand the colony organization of honey bees. • Describe the beekeeping equipment and method of honey harvesting. • Understand the nutritional and medicinal values of honey. **Sericulture:** • Enlighten the rearing methods of silk. • Explain the storage of cocoon and cocoon marketing. • Apply the knowledge to become an entrepreneur.

CC-IX: DEVELOPMENTAL BIOLOGY	• Explain the structure and function of gonads, and understand the process of spermatogenesis and oogenesis. • Explain the mechanism of fertilization and familiar with various stages involved in the developing embryo. • Understand the initial developmental procedures involved in frog and chick. • Relates the process of regeneration and asexual reproduction. • Understand various contraceptive methods and familiar with applications of Assisted Reproductive Technology.
CC-X: ENVIRONMENTAL BIOLOGY	• Understand on the basic theories and principles of ecology and learn current environmental issues based on ecological principles. • Explain the effects of light and temperature on animals. • Explain and identify the role of the organism in energy transfers. • Create general awareness on pollution and their impacts. • Gain critical understanding on human influence on environment
CC XI: IMMUNONOLGY	The students will be able to • Understand the importance of Immune system • Explain the structure and function of lymphoid organs and types of immunity. • Distinguish innate immunity and Acquired Immunity. • Familiarize with antigen – antibody reactions. • Analyze and apply hypersensitivity reactions and immunological techniques.
CC-XII: PRACTICAL-V: DEVELOPMENTAL BIOLOGY, ENVIRONMENTAL BIOLOGY AND IMMUNOLOGY	• Familiarize with the embryo development. • Develop observational, analytical and evaluation skills related to environmental biology. • Familiarize with immunological techniques.

MEC-1A: BIOSTATISTICS AND BIOINSTRUMENTATION	• Understand the importance of classification and tabulation of data. • Analyze and apply the sampling methods. • Test the hypotheses using *chi-square* test and 't' test. • Explain the principles and applications of bio instruments • Get an idea on equipments available for studying biochemical and biophysical nature of life.
MEC-I b: MICROBIOLOGY	• Recognize the scope of Microbiology. • Distinguish the structure and replication of animal, and plant virus. • Explain the nutrition for bacterial growth and the factors affecting the growth. • Produce fermented products using bacteria and yeast. • Identify disease causing pathogenic microbes.
NMEC –II: PUBLIC HEALTH AND HYGIENE	• Understand home as a health centre. • Analyze the importance of micro and macronutrients and their sources. • Explain the importance of balance diet. • Identify food toxicants and food additives. • Comprehend the maternal health care, antenatal care and congenital malformation.
CC-XIII: GENETICS AND EVOLUTION	• Describe the genetic variation through linkage and crossing over, chromosomal aberrations and sex determination. • Analyze the genetic defects and inborn errors of metabolism. • Explain the molecular structure of genetic materials and the mechanism of gene expression and regulation character formation. • Enable the students to understand the evolution of universe and life. • Understand the process and theories in evolutionary biology. • Develop an interest in the debates and discussion taking place in the field of evolutionary biology. • Explain the theories of evolution and highlighted the role of evidences in support of evolution.

CC-XIV: BIOTECHNOLOGY AND BIOINFORMATICS	**Biotechnology:** The student will be able to • Understand the modern biotechnology practices and approaches with an emphasis in technology application. • Apply the knowledge on gene cloning techniques and production of beneficial products **Bioinformatics:** The student will be able to • Apply the knowledge to collect biological data from various Biological data. • Familiar with various Applications of Bioinformatics tools. • Analyze and apply the bioinformatics tools.
CC-XV: PRACTICAL-VI: GENETICS; EVOLUTION; BIOTECHNOLOGY AND BIOINFORMATICS	• Distinguish different chromosomal aberrations in man. • Ability to identify blood group. • Familiarize knowledge of conventional biotechnological procedures. • Familiar with various Applications of Bioinformatics tools. • Analyze and apply the bioinformatics tools.
MEC-II A: AQUACULTURE AND FISH FARMING	• Describe water quality management techniques. • Explain how to set-up and maintain aquarium systems. • Ability to setup the pond layout, construction and preparation, hatchery and nursery operations. • Describe basic culture methodologies, common problems and solutions of commercially important species. • Identify the pathogens, diseases and their treatments in fishes. • Employ scientific techniques, practical skills and business management strategies to improve aquatic resource management

MEC-II B: ENDOCRINOLOGY	• Explain the endocrine secretion and their mechanism of action. • Describe the structure and hormones of pituitary gland, and their function. • Differentiate and explain the structure, function, dysfunction of thyroid, and parathyroid hormones. • Explain the structure and function of pancreatic, and adrenal gland secretions. • Relate the major endocrine hormones and their disorders.

MEC-III a: ECONOMIC ENTOMOLOGY	• Describe classification, biology and control of insect vector and control. • List the types of pesticides, modes of actions, and efficacy. • Identify the insect pests of crops, vegetables, fruits, stored grains and household pests. • Enhance the productivity of agricultural crops through insect pest management. • Explain the IPM
MEC-III b: WILDLIFE BIOLOGY	• Explain the depletion of wildlife and its importance. • Discuss the rare and endangered wildlife. • Explain the wildlife protection Act (1972) • Explain the national parks and sanctuaries. • Describe the age and sex determination in birds
SKBC-III: SERICULTURE	• Compare the non-mulberry and mulberry silk worms. • Understand the rearing methods of silk. • Explain the storage of cocoon and cocoon marketing.

M.Sc., ZOOLOGY Programme - Course Structure

Under CBCS (Choice Based Credit System)

(For the candidates admitted from the academic year 2019 – 2020 onwards)

Semester	Courses	Course Code (s)	Course Title	Hrs/ week	Credits	Exam Hrs.	Marks		Total
							Int	Ext	
I	**CC-I**		Invertebrata and Chordata	6	4	3	25	75	100
	CC-II		Cell and Molecular Biology	6	4	3	25	75	100
	CC-III		Genetics	6	4	3	25	75	100
	CC-IV		Biochemistry	6	4	3	25	75	100
	CC-V		Practical- I (Covering CC-I to CC-IV)	6	4	3	40	60	100
				30	**20**		**140**	**360**	**500**
II	**CC-VI**		Immunology	5	4	3	25	75	100
	CC-VII		Animal Physiology	5	4	3	25	75	100
	CC-VIII		Developmental Biology	4	4	3	25	75	100
	CC-IX		Practical- II (Covering CC-VI to CC-VIII)	6	4	3	40	60	100
	EC-I		Microbiology	6	5	3	25	75	100
			Wildlife and Conservation Biology						
	OEC		Medical Zoology	4	4	3	25	75	100
			Human Health and Hygiene						
				30	**25**		**165**	**435**	**600**
III	**CC-X**		Research Methodology and Biotechniques	5	4	3	25	75	100
	CC-XI		Evolution	5	4	3	25	75	100
	CC-XII		Entomology	4	4	3	25	75	100
	CC-XIII		Biotechnology	4	4	3	25	75	100
	CC-XIV		Practical- III (Covering CC-X to CC-XIII)	6	4	3	40	60	100
	EC-II		Clinical Analysis and Laboratory Techniques	6	5	3	25	75	100
			Aquaculture						
				30	**25**		**165**	**435**	**600**
IV	**EC-III**		Ecology and Ecotoxicology	6	5	3	25	75	100
			Nanobiotechnology						
	EC-IV		Cancer and Stemcell Biology	6	5	3	25	75	100
			Endocrinology						
	CC-XV		Project work	18	10	-	40	40+20 *	100
				30	**20**		**75**	**225**	**300**
			Total	**120**	**90**	**-**	**545**	**1455**	**2000**

PROGRAM SPECIFIC OBJECTIVES

1. To enable the students to learn the application of Zoological principles to the animal and human biology.
2. Understand the impact of Zoology on basic human needs such as, health care, agriculture, industrial, chemical, energy etc.,
3. To know the current development in Zoological Sciences.
4. Evaluate the future priorities in Zoological Research.
5. Know the practical areas for application of Advanced Zoological Research.
6. To develop skill in the various modern bio-techniques.

PROGRAM OUTCOMES

1. To become knowledgeable person in the subject of Zoology and apply the principles of the gained knowledge in different fields and to the needs of Society and Nation.
2. Acquisition of technical competence in specialized areas, to develop confidence and gain analytical skills in the fields of taxonomy, cell biology, developmental biology, physiology, research methodology, environmental biology, toxicology, immunology, endocrinology and biotechnology.
3. To understand and appreciate professional ethics, community living and Nation Building initiatives.
4. Ability to conduct investigation and research on problems in a chosen field of study.
5. Ability to work effectively as an individual and as a member leader in a team and to be a multi-skilled person in the field of Zoology with good technical knowledge, management, leadership and entrepreneurial skills.
6. Awareness of the social, cultural, global and environmental responsibilities as a Zoologist in various fields.
7. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning.

Course Outcomes(Cos)

Name of the Course	Course Outcomes

CC – I: INVERTEBRATA AND CHORDATA	• To develop taxonomic experts strength. • Distinguish animal kingdom of various taxonomic forms. • To evaluate mode of living of various taxonomic forms living in various environments. • Reveal the taxonomic and characteristic features of minor phyla and lower metazoans. • Identify the characters of phylum echinoderms and reveal the phylogeny and evolutionary significance of hemichordate.
CC – II: CELL AND MOLECULAR BIOLOGY	• Discuss the most significant discoveries and theories through the historical progress of biological scientific discoveries, and their impacts on the development of molecular biology. • Compare the structure of eukaryotic cells with the structure of simpler prokaryotic cells and with the structure of viruses. • Explain the fundamental structure, properties and processes in which nucleic acids play a part. • Discuss the molecular mechanisms by which DNA controls development, growth or morphological characteristics of organisms. • Independently execute a laboratory experiment using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained.
CC-III: GENETICS	• Chemistry of nucleic acids and inheritance and different experimental evidences to prove DNA and RNA as genetic materials. • Molecular level genetic of microbial reproduction. • Genetics of heritage of human and syndromes at molecular level. • Role of jumping genes and gene mutations at molecular level. • History and evolution of gene families and human genome project

CC -IV: BIOCHEMISTRY	• Explain the laws of thermodynamics and describe the intra and inter molecular interaction in biological system • Explain the structure of atom and molecule and analyze the chemical interaction. • Describe buffer system in living things. • Explain biochemical structure and function of biomolecules. • Describe the mechanism of enzymes activity and relates the structure and function of nucleic acids and Identify the types of nutrients and functions
CC – V: PRACTICAL – I (COVERING CC-I to CC-IV)	• Identification and classification of animals give to improve the knowledge among students to give an idea about new discovery of various taxa. • The training technique of dissection of invertebrate and vertebrate animals and to understand the various systems present in the body useful for drug design by the students in future.
CC-VI: IMMUNOLOGY	• Explain the structure and functions of lymphoid organs and types of immunity. Explain the structure, types and properties of antigens and immunoglobulin and analyses the role of gene rearrangement process in antibody diversity. • Describe the process and mechanism of Humoral and Cell mediated immune response and Complement pathways. Explain and analyses the structure and genetic organization of MHC. • Explain Organ transplantation and tumour immunology and relates the process of immune tolerance and autoimmunity. • Exemplify the types of hypersensitivity and explain immune response in microbial infection and to describe Hybridoma technique and its applications. • Explain and analyses antigen – antibody reactions, immunodiffusion techniques, ELISA, RIA, Western Blot, IF, Flow cytometry, FISH and GISH.
CC-III: ANIMAL PHYSIOLOGY	• After the course, the student should be able to be a competent Physiologist. • Conduct such clinical/experimental research as would have significant bearing on human health

	and patient care. • Acquire skills in conducting collaborative research in the field of physiology & allied sciences. • Must be able to demonstrate to the students how the knowledge of physiology can be used in a variety of clinical settings to solve diagnostic and therapeutic problems. • Encourage the student to participate in various workshops/seminars/journal clubs/ demonstration in the departments, to acquire various skills for collaborative research.
CC–VIII: DEVELOPMENTAL BIOLOGY	• Be able to list the types of characteristics that make an organism ideal for the study of developmental biology. • Be able to label macromeres, mesomeres, and micromeres and know which cell types are derived from each of these cell layers in the early embryo (e.g. primary and secondary mesenchyme, ectoderm, endoderm, mesoderm). • Be able to describe the stages and cellular mechanisms (ingression, invagination, convergent extension) of gastrulation in the sea urchin. Be able to describe the functions of gastrulation. • To develop the skill of observing developing organisms and recording by notes and drawings; to introduce some of the surgical and cellular experimental techniques of developmental biology. • To give training in analysing primary research papers, and in assessing experimental evidence and its interpretation.
CC – IX: PRACTICAL II: (COVERING CC-VI & CC-VIII)	• Knowledge among students to give an idea about various immunological techniques to be applied for their research work in future. • Justify various tests to detect the disorders of our body. • Describe the role of pH in our body and its impact related to body. • Relates the importance of Hemoglobin in our body. • Assess the reproductive technology and to find out structure of spermatozoa and to compare the

	type of embryo of lower forms.
EC – I a: MICROBIOLOGY	• The students will able to recognize the scope of microbiology. • Narrate the nutrition for bacterial growth and the factors affecting the growth. • Ability to produce fermented products using bacteria. • To emphasise the importance of bioremediation bacteria and its importance to clean the environment which hamper the society in various ways. • To gain knowledge about microbes as disease causing agent in various environment such as soil, water and atmosphere.
EC-I b: WILDLIFE AND CONSERVATION BIOLOGY	• To know about various wild animals' status and their importance by reading this course. • To find out the conservation issues and wildlife act to safeguard the various wild animals. • To get information of various sanctuaries and national parks and their importance so as to enable the students to face various competitive exams life IFS. • The role NGOs and their importance by carrying out various projects to safe guard the Indian wildlife. • Students get through the employment opportunities in various research institutions and the students able to understand the Indian Wildlife Protection Act (1972).

OEC a – MEDICAL ZOOLOGY	• To aware the students about personal and public health hygiene. • Analyse the importance of medical care among students in the initial stage and its preventive measures. • Explain the importance of medical care among students. • The students may take care of the society and their family or surrounding against disease causing agents. • Drug design may be attempted by the students in future.
OEC b – HUMAN HEALTH AND HYGIENE	• To aware the students about personal and public health hygiene. • Analyse the importance of medical care among students in the initial stage and its preventive measures. • Explain the importance of medical care among students. • The students may take care of the society and their family or surrounding against disease causing agents. • Drug design may be attempted by the students in future.
CC- X: RESEARCH METHODOLOGY AND BIOTECHNIQUES	• Relate to the learning process of how to write thesis and how to publish papers in various journals and to produce transformants by employing the various transfer techniques in the applied research. • Experiments with the concept of permanent mounting and its application. • Critically evaluate cell culture techniques in various experiments. • Explain the scope of Biostatistics • Test the hypotheses using chi-squre test, compare the data using 't' test, analyze the data using ANOVA, explain types of Correlation and regression and to analyze and apply various statistical tools.

CC-XI: EVOLUTION	• Describe the basic methods that are used to reconstruct the evolutionary histories of, and relationships among, groups of organisms. • Based on evolutionary theory, predict how differences in population size, natural selection and gene flow will affect genetic variation and future adaptability of populations. • Apply knowledge of evolution to the solution of problems facing the human population and to the preservation of biodiversity. • Exemplify problems in human society that are caused by a misunderstanding of the scientific process generally, and of evolution specifically
CC-XII: ENTOMOLOGY	• Explain the morphology of insects and analyze the appendages and their function. • Relates the structure and function of organ systems, describe classification, biology and control of insect vector and control. • Explain insect metamorphosis and analyze role hormones in metamorphosis and to analyze genetic material in insects. • Explain the recombinant technology in insects and to describe molecular basis of insect behavior. List the types of pesticides, modes of actions, and efficacy. Identify the insect pests of crops, vegetables, fruits, stored grains and household pests. • Enhance the productivity of agricultural crops through insect pest management and to analyze and apply the biological control of insect pests. Explain the IPM
CC-XIII: BIOTECHNOLOGY	• Explain a thorough knowledge of the genome and provide basic practices for modifying organisms to produce desired products. Experiments with concepts of selection and screening of recombinants. • Outline the methodology and the wide applications of biotechnology for the production of various industrial products. Appraise the environmental applications of biotechnology to clear the pollutants and production of bioenergy using microbe.

	• Explains the large scale cell culture and somatic cell fusion. Whole organ culture. Transgenic animal – goat. Importance of sterile fish, monosex culture of male, female by steroid hormones, hybridization and genetic selection. • Target tissue of choice for gene delivery system and application of nanotechnology in drug delivery. Concepts of pharmacogenomics and personalized medicine and thire advantages. States the approaches used for molecular markers. Methods involved and the application in forensic medicine. • Advantages of biotechnology in enzyme production using microbes. Aspects of biotechnology in the production of SCP, nitrogen fixing, Bio-pesticides and Biofertilizers to improve the agriculture.
CC – XIV: PRACTICAL - III (COVERING CC-X to CC-XIII)	• Knowledge among students to give an idea about various biotechniques to be applied for their research work in future. • Justify various tests to detect the disorders of our body. • Describe the role of pH in our body and its impact related to body. • Relates the importance of insect pest in various fields and its impact may be analysed. • Assess the various research techniques to solve the problems in near future.

EC- II a: CLINICAL ANALYSIS AND LABORATORY TECHNIQUES	• Explain the principle, types and biological application of various instruments. • Knowledge and skill in the study and analysis of various biological samples. • To get employment opportunities in various government and non governmental organizations in the field of clinical laboratory. • The learned techniques may be applied to the villagers against various disease awareness (lab to land techniques). • Laboratory accidents may be prevented to learn this course.
EC –II b: AQUACULTURE	• Ability to setup the pond layout, construction and preparation, hatchery and nursery operations in local areas to full fill the employment needs. • Describe the water quality management techniques. • Explain how to set up various aquarium systems and to maintain them. • Identify the pathogens, diseases and their treatment in fishes. • Identify global cultural, social, economic and historical factors that affect various aquaculture in natural and artificial forms.
EC- III a: ECOLOGY AND ECOTOXICOLOGY	• To know about environment and its role in various aspects. • Explain in detail the importance an conservation of natural resources. • Write the causes and effects of pollution and their control measures. • Discuss the role of individual in conservation of environment. • To know various toxicants which affect the environment and its remedial process make the students to create employment opportunities.

EC- III b: NANOBIOTECHNOLOGY	• Discuss the most significant discoveries and their impacts on the development of nanbiootechnology . • Explain the fundamental structure, properties and processes in which the nanoparticles play a part in different fields. • This field would help the students for drug discovery along with several plant extracts. • Independently execute a laboratory experiment using the standard methods and techniques in nanbiootechnology, with the appropriate analysis and interpretation of results obtained. • Process the results obtained in the conducted experiments using computer processing, and display the results in the form of a written report.
EC- IV a: CANCER AND STEM CELL BIOLOGY	• This course work provides chance to work in stem cells and cancer stem cells. • There is a chance for the students to enter into the modern cancer and stem cell laboratories as scientist
EC-IV b: ENDOCRINOLOGY	• Able to describe the organisation and structure of the endocrine systems and their relation to other organ systems. • Able to explain the endocrine systems general regulation at normal function and at deranged homeostasis. • Able to explain for how various types of hormones seems and the principles behind the function of hormone receptors. • Able to describe at a general level pharmacological treatment that includes the endocrine organs. • Able to explain the blood glucose raising and-reducing metabolic processes search after information in scientific databases.

Department of HMCS

SEM		Code	Title of the Course	Ins. Hrs	Credits	CIA	EXT	Total
I	Part – I	LC – I	Language Course I – Hindi	6	3	25	75	100
	Part - II	ELC – I	Communicative English -I	6	3	25	75	100
	Part - III	CC – I	Basic Food Production	5	4	25	75	100
		CC – II	Fundamentals of Front Office	3	3	25	75	100
		AC – I	Basic Food and Beverage Service	5	4	25	75	100
		AC – II	Accommodation Operation	3	3	25	75	100
	Part - IV	VE	Value Education	2	2	25	75	100
Total Hours and Credits (Semester – I) 7				30	22	175	525	700
II	Part – III	CC – III	Basic Food Production Practical	6	5	40	60	100
		CC – IV	Front Office Practical	6	5	40	60	100
		CC – V	IET Projects (6 Months)	10	7	140	60	200
		AC – III	Food and Beverage Practical	6	6	40	60	100
	Part – IV	EVS	Environmental Studies	2	2	25	75	100
Total Hours and Credits (Semester – II) 5				30	25	285	315	600
III	Part – I	LC – II	Language Course II – Hindi	6	3	25	75	100
	Part – II	ELC – II	Communicative English – II	6	3	25	75	100
	Part – III	CC – VI	Advanced Food Production	4	3	25	75	100
		CC –VII	Advanced Front Office Management	4	3	25	75	100
		AC – IV	Bar and Beverage Operation	4	4	25	75	100
		AC - V	Advanced Accommodation Operation	4	3	25	75	100
	Part – IV	SKBC-I	Internet Web Designing	2	2	25	75	100
	Part – IV	GS	Gender Studies	-	1	-	100	100
Total Hours and Credits (Semester – III) 8				30	22	175	625	800
IV	Part – I	LC – III	Language Course III – Hindi	6	3	25	75	100
	Part – II	ELC III	Communicative English - III	6	3	25	75	100
	Part – III	CC-VIII	Advanced Food Production Practical-I	5	4	40	60	100
		CC-IX	Hotel Accounting and Costing	5	3	25	75	100
		AC – VI	Accommodation Practical	4	4	40	60	100
	Part – IV	SKBC:II	Web Designing Lab	2	2	40	60	100
	Part – IV	SSC	Soft Skills	-	2	-	100	100
	Part – IV	NMEC-I	Basic Cookery	2	2	25	75	100
Total Hours and Credits (Semester – IV) 8				30	23	220	580	800

V	**Part – I**	**LC – IV**	**Language Course IV – Hindi**	**6**	**3**	**25**	**75**	**100**
	Part – II	**ELC IV**	**Communicative English - IV**	**6**	**3**	**25**	**75**	**100**
	Part – III	**CC – X**	**Hotel Law and Licensing**	**4**	**3**	**25**	**75**	**100**
		CC – XI	**Patisserie Theory**	**3**	**3**	**25**	**75**	**100**
		CC – XII	**Patisserie Practical**	**4**	**4**	**40**	**60**	**100**
	Part – IV	**EC – I ****	**Elective Course – 1**	**5**	**5**	**25**	**75**	**100**
	Part – IV	**NMEC - II**	**Basic Hindi**	**2**	**2**	**25**	**75**	**100**
Total Hours and Credits (Semester – V) 7				**30**	**23**	**190**	**510**	**700**
VI	**Part – III**	**CC – XIII**	**Advanced Food Production Practical – II**	**5**	**4**	**40**	**60**	**100**
		CC – XIV	**Management and Entrepreneurship**	**5**	**3**	**25**	**75**	**100**
		CC – XV	**Advanced Food and Beverage Practical**	**5**	**4**	**40**	**60**	**100**
		CC- XVI	**Computer Application in Hotel Industry**	**5**	**3**	**40**	**60**	**100**
		EC – II **	**Elective Course – 2**	**5**	**5**	**25**	**75**	**100**
		EC – III**	**Elective Course – 3**	**5**	**5**	**25**	**75**	**100**
	Part – IV		**Extension Activities**	**-**	**1**	**-**	**-**	**100**
Total Hours and Credits (Semester – VI) 7				**30**	**25**	**195**	**405**	**700**
				180	**140**	**..**	**..**	**4300**
	Part – IV	**CC**	**Comprehensive Course**	**-**	**4**	**-**	**-**	**100**
	Part – IV	**SKBC**	**SKBC – 3**	**-**	**2**	**25**	**75**	**100**
GRAND TOTAL (For All Semesters) 42+2				**180**	**146**			**4500**

PROGRAMME EDUCATIONAL OBJECTIVES

- To understand the fundamentals of the Hotel Industry, Commercial Kitchen Operations, Food & Beverage Service and the Wines
- To create a blue print of hospitality career & get exposed to crucial hospitality management concepts.

To attain professional expertise by being competent, creative and ever ready to accept new and challenging roles in Industry and Academics.

PROGRAMME OUTCOMES

PO 1: To provide our students with an in depth understanding of the operational aspects and knowledge of the underlying principles of the International Hospitality Industry.

PO 2: To allow students to become familiar with the practical aspects of the hospitality industry and the strategic management issues involved in operating International Resorts and Hotels.

PO 3: To present to them an avenue to move into range of international organizations in service sector.

PO 4: To train students for operational and administrative supervisory & management positions.

PO 5: To prepare graduates for management careers in industry sectors such as Hotels, Resorts, Cruise Liners, Restaurants and Catering Organizations

PO 6: To develop management skills and learn culinary skills for a successful career as a hospitality management professional

PROGRAMME SPECIFIC OUTCOMES

PSO 1: To apply knowledge of Humanities and Management in catering science and hotel management.

PSO 2: To apply knowledge of various cooking techniques in kitchen.

PSO 3: To create a new trend to be followed the rooms and also to design a new menu and dishes

PSO 4: To use advanced equipment technology including catering science and hotel management.

PSO 5: To communicate effectively with all stake holders and work individually and as a member of a team.

PSO 6: Recognition of the need for, and an ability to engage in life-long learning.

Course Outcomes(Cos)

Name of the Course	Course Outcomes
LC I – HINDI	**CO – 1:** help the students to understand the fundamentals of Hindi **CO – 2:**train the students in grammar aspects of Hindi **CO – 3:** equip the students to identified and familiarize industrial terms in relation with Hindi
ELC I – COMMUNICATIVE ENGLISHI	**CO – 1:** inculcate the ability of reading and understanding texts in English. **CO– 2:**learn the grammatical patterns and usage for written and spoken skills in English. **CO- 3:**equip with spoken forms needed especially in connection with hospitality industry.
CC I – BASIC FOOD PRODUCTION	**CO – 1:**explain culinary heritage with the cooking methods, equipment's and basis food commodities **CO – 2:**demonstrate the ability to organize and perform the basis pre-cooking kitchen works , and cooking works, and reduce operational variances of cooked food **CO – 3:**asses balanced diet, food quality and action of heat on food ingredients
CC II – FUNDAMENTALS OF FRONT OFFICE	**CO – 1:**gain expertise in handling communication, occupancy forecasting and other documentation. **CO – 2:** get a hard on experience with the modern communication equipment **CO – 3:**gets in-depth knowledge about travelling documents and travel procedure. **CO – 4:** handle different situation that came across India to day observation.
AC I – BASIC FOOD & BEVERAGE SERVICE	**CO – 1:**Identify different kind of hotel industry and their growth in India all so the role of catering establishment. **CO – 2:**Differentiates between F&B outlet such as specialty restaurant coffee shop, room service, cafeteria, fast food, grill room, banquet, bar, etc. **CO – 3:**Explain different type of Equipment cutlery, crockery, glassware, flatware **CO – 4:** Apply different food & beverage service, such English service, silver service, American
AC II-ACCOMMODATION OPERATION	**CO – 1:**Identify different kind of hotel industry and their growth in India all so the role of catering establishment. **CO – 2:**Differentiates between F&B outlet such as specialty restaurant coffee shop, room service, cafeteria, fast food, grill room, banquet, bar, etc. **CO – 3:**Explain different type of Equipment cutlery, crockery, glassware, flatware **CO – 4:** Apply different food & beverage service, such English service, silver service, American

CC III – BASIC FOOD PRODUCTION PRACTICAL	**CO – 1:**illustrate knowledge of kitchen equipment raw materials, knife, skills. **CO – 2:**employ personal hygiene, first aid, safety, practices observe in hotel industry. **CO – 3:**prepare gravy, egg dishes and sweet dishes. **CO – 4:** apply cooking methods to cook commodities.
CC IV– FRONT OFFICE PRACTICAL	**CO – 1:**handle front office equipment. **CO – 2:**manage the guest check in and check out. **CO – 3:**register and reserve guest at hotel front office. **CO– 4:**execute the procedure and function of front office and use the front office terminologies.
CC V - INDUSTRIAL EXPOSURE TRAINING	**CO – 1:** gain industrial knowledge and types of outlets in the industry **CO – 2:**apply practical knowledge in various departments **CO – 3:** understand the job position and work schedules **CO – 4:** study about the industry and improve themselves
AC III – FOOD & BEVERAGE PRACTICAL	**CO – 1:**identify different kinds of service of service equipment **CO – 2:**demonstrate different type of napkin folds; prepare side board in a service restaurant **CO – 3:**explain the procedure clearing & polishing glassware used in a restaurant **CO – 4:** handling K.O.T. Trace Settings, Clearance and Guest Needs
LC II – HINDI	**CO – 1:** make the students speak individually **CO – 2:**prepare the students to communicate with guest **CO – 3:** help the students to frame a sentence
ELC II – COMMUNICATIVE ENGLISH – II	**CO – 1:** pronounce industrial words appropriately **CO – 2:**effectively understand and produce varieties of tones in communication **CO – 3:** communicate sensibly in any situation
CC VI – ADVANCED FOOD PRODUCTION	**CO – 1:** prepare assorted French menus with the appropriate ingredient **CO – 2:**demonstrate practical skills and techniques to prepare stocks and soups **CO – 3:** present the menu consisting of soups, main course and desserts; Calculate the yield of various foods.
CC VII – ADVANCED FRONT OFFICE MANAGEMENT	**CO – 1:**gain expertise in handling communication, occupancy forecasting and other documentation. **CO – 2:**get a hard on experience with the modern communication equipment **CO – 3:**gets in-depth knowledge about travelling documents and travel procedure. **CO – 4:** know how to handle different situation that came across India to day observation.

AC IV – BAR AND BEVERAGE OPERATION	**CO – 1:**Student will be trained in the processing and serving of various spirits, cocktails and liquors. **CO – 2:**Student will be aware of the various brands the production and presentation **CO – 3:**Accompaniments and garnishes used with the beverage. **CO – 4:**Describe the production of wine, its service and terminology
ADVANCED ACCOMMODATION OPERATION	**CO – 1:**explain the role and responsibility of the house keeping. Department in hotel operations and the materials and processes used to ensure a high standard of maintenance safety and security in the facility. **CO – 2:** evaluate the materials, method and systems needed to maintain a clean, safe and secure environment. **CO – 3:**apply housekeeping concepts in a group project that requires team working and planning skill.
SKBC I - INTERNET AND WEB DESIGN	**CO – 1:** design and develop a static HTML page **CO – 2:**create a user interface using HTML forms **CO – 3:** Develop web page using HTML Widgets
LC III - HINDI	**CO – 1:** help the students make a sentence from other language to Hindi **CO – 2:**train the students in comprehensive aspects of Hindi **CO – 3:** equip the students to identified and familiarize industrial terms in relation with Hindi
ELC III – COMMUNICATIVE ENGLISH - III	**CO – 1:** Understand the various functions of a similar word in situations **CO – 2:**Enable to express flawlessly **CO – 3:** Groom the students to use modern technology in communication
CC VIII- ADVANCED FOOD PRODUCTION PRACTICAL– I	**CO – 1:**Prepare assorted all type of continental menus. **CO – 2:**Demonstrate practical skill and techniques to prepare stocks and soups. **CO – 3:**Prepare French classical menu with different type courses
CC IX – HOTEL ACCOUNTING & COSTING	**CO – 1:** Draw from financial information to construct a debit/credit transaction **CO – 2:**Demonstrate knowledge of the business accounting cycle for the corporate form of business **CO – 3:** Identify and describe terms associated with financial accounting **CO – 4:** Demonstrate knowledge of accounting for cash, receivables, inventory long-term assets, current liabilities, and long-term liabilities

AC VI - ACCOMMODATION PRACTICAL	**CO – 1:**aware of interior decoration, flower arrangement, horticulture and pest controlling being a vital part of housekeeping **CO – 2:**able to handling emergency situation co – ordinate with other departments in the hotel practice and create safe work environment. **CO – 3:**achieve a basic knowledge of all these selections individually
KBC II - WEB DESIGN LAB	**CO – 1:** create Webpages. **CO – 2:**use different kinds of style sheets. **CO – 3:** design the User Interfaces using HTML Forms.
NMEC I – BASIC COOKERY	**CO – 1:** understand the basic kitchen knowledge **CO – 2:**apply the aims and objectives of kitchen **CO – 3:** relate the types of cooking methods
LC IV - HINDI	**CO – 1:** help the students make a sentence from other language to Hindi **CO – 2:**train the students to compare articles around them **CO – 3:** equip the students to identified and familiarize industrial terms in relation with Hindi
ELC IV – COMMUNICATIVE ENGLISH – IV	**CO – 1:** learn alternative words of industrial importance **CO – 2:**Enable proficient written and oral communication **CO – 3:** Able to make an impression to win a career in the industry.
CC X – HOTEL LAW & LICENSING	**CO – 1:**Research relevant Provincial legislation for applicable statutes and laws in case studies concerning the hospitality and tourism industry **CO – 2:**Apply legal agreements to determine validity of contracts commonly found in the hospitality and tourism industry **CO – 3:**Differentiate practical business decisions for the physical security of hospitality and tourism buildings, contents, and property. **CO – 4:** Calculate insurance liabilities for various situations relevant to the hospitality and tourism industry.
CC XI – PATISSERIE THEROY	**CO – 1:** Exhibit supervisory skills in kitchen organization **CO – 2:**Display creativity in cake decoration **CO – 3:** Demonstrate techniques in Bakery and confectionery **CO – 4:**Apply standard procedures involved in pastry preparations

CC XII – PATISSERIE PRACTICAL	**CO – 1:**Apply safety and sanitation procedures in a professional food service kitchen to plan and organize a designated work station **CO – 2:**correctly weigh, measure and scale ingredients for a recipe using bakers percentage and the metric system to meet designated production requirements **CO – 3:**interpret recipes, make any changes necessary to utilize given baking recipe and follow appropriate work sequences **CO – 4:**describe the function and application for a variety of common baking ingredients
EC I(a) - TRAVEL & TOURISM MANAGEMENT	**CO – 1:**Identify the meaning and concepts of hospitality and tourism. **CO – 2:** Interpret the forms and types of tourism. **CO – 3:**Develop the insight of hospitality & tourism products. **CO – 4:**Conceptualize the various aspects of hospitality and tourism
EC I(b) - INDUSTRIAL CATERING	**CO – 1:**Identify the different catering services in an industry **CO – 2:** Interpret the various forms of catering services with menu planning **CO – 3:**Develop the basic idea about the outdoor catering **CO – 4:**understand the rules and regulations of industrial catering services
NMEC II - BASIC HINDI	**CO – 1:** help the students to understand the fundamentals of Hindi **CO – 2:**train the students in grammar aspects of Hindi **CO – 3:** equip the students to identified and familiarize terms in relation with Hindi
CC XIII – ADVANCED FOOD PRODUCTION PRACTICAL – II	**CO – 1:**explain advanced culinary heritage with the cooking methods, equipment's and basis food commodities **CO – 2:**demonstrate the ability to organize and perform the basis pre-cooking kitchen works , and cooking works, and reduce operational variances of cooked food **CO – 3:**asses balanced diet, food quality and action of heat on food ingredients
CC XIV – MANAGEMENT AND ENTREPRENEURSHIP	**CO – 1:**Explain management functions of a manager. Also explain planning and decision making processes. **CO – 2:**Understanding of Entrepreneurships and Entrepreneurship development process. **CO – 3:**Illustrate Small Scale Industries, various types of supporting agencies and financing available for an entrepreneur. **CO – 4:** Summarize the preparation of project report, need significance of report.

CC XV – ADVANCED FOOD & BEVERAGE PRACTICAL	**CO – 1:** train the processing and servicing of various spirits, cocktails and liquors. **CO – 2:**aware of the various brands the production and presentation **CO – 3:**describe the production of wine, its service and terminology **CO – 4:** suggest service techniques and wine to accompany foods
CC XVI – COMPUTER APPLICATION IN HOTEL INDUSTRY	**CO – 1:**Explain the fundamental software and hardware component of computer along with its generations and storage devices used. **CO – 2:**Illustrate the difference between an operating system and an application program. **CO – 3:** apply the software knowledge for preparing spreadsheet and power point presentation
EC II (a)– NUTRITION FOOD SCIENCE	**CO – 1:**Identify different food effective of heat changes it's storage and its nutrient contribution. **CO – 2:**Explain origin of spice it properties and its significance in field of Ayurveda and medical application **CO – 3:** prepare various beverage and preserve their nutritive value
EC II (b) – FACILITY PLANNING	**CO – 1:** Train to coordinate an event **CO – 2:**Enable students to understand interior and exterior designs that compliments an event and reproduce as necessary **CO – 3:** Educate students on technical subsidies to improvise the standards of an event
EC III (a) – FOOD PRESERVATION	**CO – 1:**understand the spoilage and deterioration of food and raw materials **CO – 2:**explain the properties and uses of various packing materials **CO – 3:** evaluate the effect of processing and storage condition on self-life of food **CO – 4:**able to differentiate preservation methods appropriate for natural food
EC III (b) – HUMAN RESOURCE MANAGEMENT	**CO – 1:**remember the importance of human resource management in organizations. **CO – 2:**get the idea about training and development needed to the human resource. **CO – 3:**execute the nature and sources of conflict and different strategies, approaches used in the resolution of conflict. **CO – 4:** analyze the key issues related to administering the human elements such as motivation, performance appraisal, recruitment and training.

BACHELOR OF COMPUTER APPLICATIONS
(BCA)
Curriculum Framework for the year 2019-2020

SEM	PART	TITILE	HRS	CRE	CIA	EE	TOT
I	I	Language Course - I (Tamil)	6	3	25	75	100
	II	English Language Course - I (English)	6	3	25	75	100
	III	CC - I Programming in C	5	5	25	75	100
		CC - II Programming in C Lab	3	2	40	60	100
		AC - I Statistical Methods	4	4	25	75	100
		AC-II Operations Research for computer applications	4	4	25	75	100
	IV	VE - Value Education	2	2	25	75	100
II	I	Language Course - II (Tamil)	6	3	25	75	100
	II	English Language Course - II (English)	6	3	25	75	100
	III	CC - III Object Oriented Programming Using C++ and Data structures	6	5	25	75	100
		CC – IV C++ and Data structures Lab	3	2	40	60	100
		AC - III Algebra and Calculus	5	4	25	75	100
	IV	SKBC - I Data Analytics	2	2	25	75	100
		EVS - Environmental Science	2	2	25	75	100
	I	Language Course - III (Tamil)	6	3	25	75	100
III	II	English Language Course - III (English)	6	3	25	75	100
	III	CC - V Problem solving using Python	5	5	25	75	100
		CC- VI Python Lab	3	2	40	60	100
		AC - IV Principles of Accountancy	5	4	25	75	100
		AC - V Accounts Package Lab	3	-	-	-	-
	IV	SKBC - II Image Editing	2	2	25	75	100
		GS - Gender Studies	0	1	25	75	100

IV	I	Language Course - IV (Tamil)	6	3	25	75	100
	II	English Language Course – IV(English)	6	3	25	75	100
	III	AC - V Programming using 'R' Lab	3	4	40	60	100
		CC - VII Database Systems	5	5	25	75	100
		CC - VIII RDBMS Lab	3	2	40	60	100
		AC - VI Digital Principles and Fundamentals	5	4	25	75	100
	IV	NMEC I	2	2	25	75	100
		SSC - Soft Skills Course	0	2	25	75	100
V	III	CC - IX Programming in JAVA	6	5	25	75	100
		CC - X Principles of Operating System	5	5	25	75	100
		CC - XI Data and Communication Networks	6	5	25	75	100
		CC - XII Java and System Administrations Lab	6	4	40	60	100
		Elective Course – I	5	5	25	75	100
	IV	NMEC II	2	2	25	75	100
VI	III	CC- XIII Mobile Apps Development	6	5	25	75	100
		CC - XIV Web Technology	6	5	25	75	100
		CC - XV Mobile Apps and Web technology Lab	6	4	40	60	100
		Elective Course – II	5	5	25	75	100
		Elective Course - III	5	5	25	75	100
	IV	EA - Extension Activities	0	1	-	-	-
	III	Technical Skill Development	2	-	-	-	-
			180	140	1105	2895	4000
	III	Comprehensive Course		4*			100

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

The Graduates of BCA programme will be able to

PEO1: Enhance creative and innovative thinking for improving their career.

PEO2: apply computing principles and related domain knowledge to work as a team or individual in IT fields, public and private sectors.

PEO3: apply current tools and techniques to create real world problems.

PEO4: pursue higher studies and professional development in their field.

PROGRAM OUTCOMES (PO)

At the end of the Programme the students will be able to

PO1: Scientific Knowledge: Apply the mathematical and computing knowledge to solve the problems.

PO2: **Problem Analysis**: Conceptualize, analyze and experiment solutions for complex problems.

PO3: Design and Development of Solution: Apply algorithmic and computational knowledge to provide solutions to the problems in diverse domain.

PO4: Conduct investigations of complex problems: Ability to design and develop algorithms by providing solutions to complex problems.

PO5: Modern Tool Usage: Create, select and adapt modern tools to solve real life problems.

PO6: Life Long Learning: Develop the independent and lifelong learning, according to the current socio-technological scenario.

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO1: Apply computational techniques to solve problems in diverse domain

PSO2: Ability to work as a team or individual with professional ethics

PSO3: develop, select or use the algorithms to implement the specified concepts

PSO4: Understand the concepts and ability to design and apply appropriate methods and techniques

Course Outcomes(Cos)

Name of the Course	Course Outcomes
AC-III Algebra and Calculus	**CO1**: Understand the concepts of types of matrices, successive differentiation and Laplace transform **CO2**: Find the eigen values and vectors, Leibnitz's theorem and its application. **CO3**: solve problems using integration **CO4**: Apply the concepts of Laplace transforms of e^{at}, , t^n and integration by parts and its properties. **CO5**: Solve the second order differential equation of the type .
CC-I PROGRAMMING IN C	**CO1:** summarize the basic knowledge of programming **CO2:** understand the syntax and semantics of C language **CO3:** apply the concepts of functions and arrays in solving real world problems **CO4:** demonstrate structures, union and pre-processing techniques **CO5:** develop programs using pointers and file concept
CC-II DATA ANALYTICS LAB	**CO1:** develop and execute programs using Operators and control Structures **CO2:** generate charts for the given data in the spreadsheet and use pivot table **CO3:** Apply the programming concepts of C in the standalone applications. **CO4:** demonstrate the data analysis using Data Analysis Toolpak in spreadsheet.
CC-V PROBLEM SOLVING USING PYTHON	**CO 1:** acquire the concepts of Mean, Median and Standard deviation **CO1:** write programs to solve simple problems **CO2:** understand the knowledge of Skewness and Kurtosis, Correlation and Regression Analysis **CO3:** store and manipulate data using file system and handling errors CO3: analyze various methods to find correlation **CO4:** solve problems using OOPs concept **CO 3:** apply the knowledge of axiomatic approach to independent events **CO5:** design GUI forms using Tkinter **CO 4:** evaluate the Binomial, Poisson and Normal Distribution
AC-I Statistical Methods	**CO1:** develop and execute programs using Operators and control Structures **CO1:** convert standard business problems into linear programs. **CO2:** solve programs using sequences, functions and modules **CO2:** solve linear programming problems by Graphical solution, Simplex and Big-M method. **CO3:** design and execute programs using OOPs concepts and Tkinter Module **CO3:** apply transportation techniques to find least cost route **CO4:** apply the fundamental concept of sequencing problem **CO5:** evaluate the PERT and CPM
CC-VI PYTHON LAB	
AC-II Operations Research for Computer Applications	
CC-III OBJECT ORIENTED PROGRAMMING USING C++ AND DATA STRUCTURES	**CO1:** Describe the basics of OOP and the syntax of C++ language **CO2:** Apply the knowledge of functions, classes and objects for solving problem in the real world **CO3:** Experiment the concepts of initialization and destruction of objects and Test the usage of overloading of unary and binary operators **CO4:** Demonstrate the usage of inheritance and polymorphism while solving real time problem **CO5:** Apply file concepts and solve problems related to data files. **CO6:** Implement the fundamental data structures using C++ language
AC-IV PRINCIPLES OF ACCOUNTANCY	**CO1:** acquire the concepts of Accounting Concepts and conventions, Journal, Ledger, Trail Balance **CO2:** understand the knowledge of purchase, Purchase return, Sales, Sales return and Cash Book **CO3:** apply accounting concepts in prepaid expenses and outcomes, capital and drawings by solving problems **CO4:** Evaluate the assets and replace that are envisaged **CO5:** Exhibit the accounts of branch and departments **CO1:** Acquire the skills of computerized accounting system **CO2:** Enhance to create the company, groups and ledgers **CO3:** Apply the skills to preparation of final accounts with adjustments **CO4:** Evaluate the concept of inventory management. **CO5:** Analyze the report of cost centers and cost categories
ACCOUNTS PACKAGE LAB	
CC-IV C++ AND DATA STRUCTURES	**CO1:** apply the concepts to solve problems using C++ programming language **CO2:** implement the basic data structures using C++ **CO3:** solve problems using OOPs concept
SKBC-II IMAGE EDITING LAB	**CO1:** apply various animation techniques **CO2:** apply various concepts of image editing using GIMP tool **CO3:** design and execute programs using Animation concepts and different styles.

CC-VII DATABASE SYSTEMS	**CO1:** understand the fundamentals of database system. **CO2:** design and create tables in database and execute queries. **CO3:** apply knowledge about file system. **CO4:** design a database based on a data models using normalization. **CO5:** have knowledge in network and hierarchical data base system.
CC-VIII RDBMS LAB	**CO1:** design and implement database schema for the given problem **CO2:** populate and query using DDL,DML,DCL,TCL prepare SQL reports **CO3:** create implicit and explicit cursor. and create triggers, procedures and function to manipulate with required data
AC-V ROGRAMMIN G USING _R' LAB	**CO1:** solve simple problems using R scripts **CO2:** apply data structures to solve the given problem **CO3**: parse data files using built-in functions and apply the various statistical functions and to produce high quality graphics
AC-VI DIGITAL PRINCIPLES AND FUNDAMENT ALS	**CO1:** understand the fundamentals of number system and its conversions. **CO2:** design simplified circuits using Boolean laws and map simplifications. **CO3:** apply the functions of basic gates to design combinational circuits. **CO4:** describe the functions of sequential circuits. **CO5:** categorize memory types and its functions.
NMEC-I INTERNET AND WEB DESIGN	**CO1:** Understand various text formatting tags **CO2:** categorize head and body section tags **CO3:** explain list and table tags **CO4:** design and develop a static HTML page **CO5:** create a user interface using HTML forms
NMEC-I BPO AND HEALTH CARE	**CO1:** explain the basics of outsourcing with its applications. **CO2:** describe the skill sets required and types of BPO in Industry perspective**.** **CO3:** apply various output formats and layouts. **CO4:** describe quality concepts and SPC **CO5:** illustrate outsourcing trends and HR activities of BPO.

CC-IX PROGRAMMING IN JAVA	**CO1**: Identify the distinct properties and features of Object Orientations using JAVA **CO2**: Analyze the name space, Exception conditions and concurrency condition in JAVA using package and Exception handling and Thread. **CO3**: Discuss Input/Output functions with file manipulations using I/O Streams. **CO4**: Analyze GUI programming applications using AWT packages. **CO5**: Plan to Develop Java based Applications using GUI and user interface and database Connectivity
CC-X PRINCIPLES OF OPERATING SYSTEMS	**CO1:**understand the types, design, implementation of operating system and I/O programming concepts. **CO2:** recognize the management of main and virtual memory schemes. **CO3:**analyze different scheduling algorithms. **CO4:** analyze the management of devices. **CO5:** understand information management
CC-XI DATA and COMMUNICATION NETWORKS	**CO1:** recognize the basic concepts of computer Network throw OSI Model **CO2:** acquire the knowledge about Signals and conversions **CO3:** analyze the concepts of Data link Protocols and Networking switching and devices **CO4:** illustrate the Internet communication technology and its protocols **CO5:** describe various protocols in TCP/IP suite
CC-XII JAVA AND SYSTEM ADMINISTRATION LAB	**CO1:** solve programs using the basic concepts in JAVA **CO2:** apply JDBC to work with back end and build simple applications **CO3:** apply basic commands and solve simple administrative tasks using LINUX
EC-I- CLOUD COMPUTING	**CO1:**explain the characteristics, features and virtualization required for cloud computing **CO2:** illustrate the basic terminology and techniques of cloud computing **CO3:** analyze the usage and security of cloud. **CO4:** explain collaboration on word, presentation and project management **CO5:** apply and understand the different types of cloud apps.
EC-I- MOBILE COMMERCE	**CO1:** understand the concepts of e-Commerce **CO2:** explain the basic terminology and techniques of mobile commerce **CO3:** analyze the usage of mobile commerce. **CO4:** apply the mobile commerce concepts in applications. **CO5:** illustrate the services of business-to-business m-commerce

EC-I- BIG DATA ANALYTICS	**CO1:**understand the concepts and characteristics of Big data **CO2:**Analysis the basic terminology and techniques **CO3:** understand database with big data. **CO4:** manipulate Hadoop frame work **CO5:** discuss map reduce and Yarn
NMEC-II OFFICE AUTOMATIO N LAB	**CO1:** create documents, apply formatting, editing text and paragraphs **CO2:** create document with tables and mail merge **CO3:** use spreadsheet for calculations and apply formatting **CO4:** apply macro concept **CO5:** prepare a presentation for a seminar
NMEC-II IMAGE EDITING TOOLS LAB	**CO1:** apply various animation techniques **CO2:** apply various concepts of image editing using GIMP tool **CO3:** design and execute programs using Animation concepts and different styles.
CC- XIII MOBILE APPS DEVELOPME NT	**CO1:** Student has the knowledge on architecture of Android software stock. **CO2:** Student get the exposure about different types of project resources **CO3:** Student can create their own application. **CO4:** Student able to enhance the application with LBS, Network features, etc. **CO5:** Students can generate the APK and Market it in
CC- XIV WEB TECHNOLOG Y	**CO1:** design a static web page using HTML **CO2:** validate the HTML form data using JavaScript **CO3:** develop server side scripts using PHP **CO4:** communicate with MySQL database from PHP **CO5:**demonstrate mysql functions and avoiding errors
CC-XV MOBILE APPS AND WEB TECHNOLOG Y LAB	**CO1:** design a static web page using HTML **CO2:** validate the HTML form data using JavaScript **CO3:** develop server side scripts using PHP **CO4:** communicate with MySQL database from PHP **CO5:** implement an application using Mobile Apps Layouts and Events **CO6:** Understand the concepts of Sqlite
EC-II SOFTW ARE ENGINEERIN G	**CO1:** illustrate basics of software engineering, various factors and planning for development process. **CO2:** analyze the software for cost, time and effort and prepare SRS **CO3 :** classify various design techniques and criterias for software development **CO4:** apply coding standards and guidelines to create a software **CO5:** understand various quality measures and metrics

EC-II ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM	**CO1:**Understand AI problems and techniques **CO2:** categorize various searching techniques. **CO3**: explain knowledge representation issues **CO4**: apply predicate logics **CO5:**illustrate expert system life cycle
EC-II COMPUTER GRAPHICS	**CO1:** design two dimensional graphics. **CO2:** apply two dimensional transformations. **CO3**: design three dimensional graphics. **CO4**: apply three dimensional transformations. **CO5:** apply clipping techniques to graphics. **CO6:** design animation sequences.
EC-III DISTRIBUTED APPLICATIONS USING .NET	**CO1:** The student will use Visual Basic.Net to build Windows applications using structured and object-based programming techniques. **CO2:** Design/develop programs with GUI interfaces **CO3:** Perform tests, resolve defects and revise existing code **CO4:** Develop dynamic web applications, create and consume web services **CO 5**: Create applications that use ADO. NET **CO6**: Use appropriate data sources and data bindings in VB.NET / ASP.Net.
EC-III SOFTCOMPUTING	**CO1:** acquire the concepts of Fuzzy and SET theory **CO2:** understand the knowledge of Optimization techniques **CO3:**illustrate the various learning methods of learning in neural networks **CO4:** apply the knowledge of neuro fuzzy models. **CO5:** identify and specify different soft computing Applications.
EC-III INTERNET OF THINGS	**CO1:** recognize the fundamentals of IOT **CO2:** acquire the knowledge of IOT architecture **CO3:** interpret the protocols used in Data link and Network layer in IOT **CO4:** classify different protocols used in different layers of IOT **CO5:** relate the service layer and application layer protocols in IoT architecture

MASTER OF COMPUTER APPLICATIONS							
STRUCTURE 2019 -2020							
SEM	**COU**	**TITLE**	**HRS**	**CRE**	**INT**	**EXT**	**TOT**
I	FC1	Problem Solving using C & C++	4	4	25	75	100
	FC2	Principles of Operating System	4	4	25	75	100
	FC3	Digital Design and Architecture	4	4	25	75	100
	FC4	C & C++ Lab	4	2	40	60	100
	FC5	Shell Programming Lab	4	2	40	60	100
	SC1	Mathematical Foundations in Computer Science	4	4	25	75	100
	SC2	Human Resource Management	4	4	25	75	100
	CB	Competency Building Programme	2	-			
	TOTAL		**30**	**24**			**700**
II	CC1	Programming in JAVA	4	4	25	75	100
	CC2	Database Systems	4	4	25	75	100
	CC3	Data Structures and Algorithm	4	4	25	75	100
	CC4	Computer Networks	4	4	25	75	100
	CC5	Java Lab	4	2	40	60	100
	CC6	Database Lab	4	2	40	60	100
	SC3	Statistics and Linear Programming	4	4	25	75	100
	CB	Competency Building Programme	2	-	-	-	-
	TOTAL		**30**	**24**			**700**
III	CC7	Scripting Languages (JavaScript, JQuery, Angular JS, Node JS)	4	4	25	75	100
	CC8	Web Design and Development [PHP, MYSQL, AJAX and JOOMLA)	4	4	25	75	100
	CC9	Data Mining and Warehousing	4	4	25	75	100
	CC10	Scripting Lab	4	2	40	60	100
	CC11	Web Design Lab	4	2	40	60	100
	SC4	Accounting and Financial Management	4	4	25	75	100
	EC1	Service Oriented Architecture Computer Graphics Mobile Computing	4	4	25	75	100
	CB	Competency Building Programme	2	2	100	-	100
	TOTAL		**30**	**26**			**800**

MASTER OF COMPUTER APPLICATIONS							
STRUCTURE 2019 -2020							
SEM	**COU**	**TITLE**	**HRS**	**CRE**	**INT**	**EXT**	**TOT**
IV	CC12	Game Design and Development using Python	4	4	25	75	100
	CC13	Distributed Programming using J2EE	4	4	25	75	100
	CC14	Software Engineering	4	4	25	75	100
	CC15	Game Development Lab	4	2	40	60	100
	CC16	J2EE Lab	4	2	40	60	100
	OEC	Internet of Things	4	4	25	75	100
		Embedded Systems					
	EC2	Machine Learning	4	4	25	75	100
		Cyber Security					
		Functional Programming					
	CS	Coding Skill	2	1	100	-	100
	TOTAL		**30**	**25**			**800**
V	CC17	Mobile Application Development	4	4	25	75	100
	CC18	.NET Programming	4	4	25	75	100
	CC19	Compiler Design	4	4	25	75	100
	CC20	Mobile Application Development Lab	4	2	40	60	100
	CC21	.NET lab	4	2	40	60	100
	EC3	Cloud Computing	4	4	25	75	100
		Digital Image Processing					
		Software Testing					
	EC4	Big Data Analytics	4	4	25	75	100
		Computer Forensics					
		Software Project Management					
	OC	Online Course (MOOCS)	2	1	100	-	100
	TOTAL		**30**	**25**		**33**	**800**
VI	PW	Project Work	30	16	100	100	**200**
IV	IS	Internship*	-	2	100	-	**100**
V	MP	Mini Project*	-	2	100	-	**100**
			180	**144**			**4200**

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Post Graduates of MCA Programme will be able to

PEO1: Design, model and develop smart applications by utilizing strong technical and domain knowledge acquired from the programme for the improvement of society.

PEO2: Apply current tools, technologies and critical thinking to develop applications for solving industry oriented problems

PEO3: Function as a member of a team and develop projects in a multi-disciplinary environment by emulating leadership skills

PEO4: Work productively as computer professionals by adopting to environment with lifelong learning and adhering to ethical standards

PROGRAMME OUTCOMES (PO)

At the end of the MCA programme, the students will be able to

PO1: Scientific Knowledge
Apply the knowledge in mathematics, statistics and computer science to solve the real life problems.

PO2: Problem Analysis
Ability to analyze and design applications by solving problems in the field of computer science.

PO3: Design and Development of Solution

Design applications for any specific needs from societal and environmental aspects.

PO4: Conduct investigations of complex problems

Investigate and apply technical skills to solve complex problems

PO5: Modern tool usage

Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to obtain solutions

PO6: Communication

Communicate effectively and present technical information both in oral and written form.

PO7: Individual and team work

Function competently as an individual and as a leader in a team project

PO8: Link with society & Ethics

Work in professional environment by adhering professional ethics and involved in perennial learning in the context of social, economic and cultural aspects

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO 1: Apply the scientific Knowledge acquired to develop smart Applications.

PSO 2: Ability to design and develop software with appropriate documentation.

PSO 3: Apply Current tools and techniques to design and develop innovative Applications

PSO 4: Understand the concepts in the specified domain and ability to apply it in real life problems

Course Outcomes(Cos)

Name of the Course	Course Outcome
PROBLEM SOLVING USING C AND C++	**CO1**: interpret the syntax and semantics of C language for solving problems **CO2**: apply the concepts of functions, storage classes and array in real world problems **CO3**: develop programs using pointers and files **CO4**: describe the basic concepts of OOP paradigm **CO5**: develop C++ programs for friend functions, inheritance and polymorphism
PRINCIPLES OF OPERATING SYSTEM	**CO1:** describe the services provided by operating systems, system calls and the structure system. **CO2:** illustrate process description, mutual exclusion, deadlock detection and starvation. **CO3:** categorize the management of main, virtual memory and scheduling algorithms. **CO4:** describe I/O and file organization. **CO5:** recognize the concepts of Network operating system
DIGITAL DESIGN AND ARCHITECTURE	**CO1**: Classify different types of data and representation of data **CO2**: Design Combinational and Sequential digital functions **CO3**: Explain an instruction set capable of performing a specified set of operations **CO4**: Categorize modes of data transfer and Compare different ways of communication with I/O Devices **CO5**: Distinguish Different types of memory
C & C++ LAB	**CO1:** design algorithms for the given problem and Write programs in C and C++ **CO2:**write C programs using pointers, Structures and unions **CO3**: implement C++ programs using OOPs concepts **CO4**: Build C and C++ applications to solve any kind of real world problem
SHELL PROGRAMMING LAB	**CO1:**demonstrate the installation of OS and work with basic commands **CO2:**apply the basic commands to create scripts **CO3:** develop scripts for the given problem specification **CO4**: write a shell scripts to solve the real world problems

MATHEMATICAL FOUNDATION IN COMPUTER SCIENCE	**CO1:** Apply consistency equations to solve matrix problems **CO2:** Utilize mathematical logic to analyze theory of inference **CO3:** Apply set theory concepts to work with relations **CO4:** Represent lattices and its properties **CO5:** Design map to get simplified form of Boolean function
HUMAN RESOURE MANAGEMENT	**CO1:** identify the concepts, functions and trends in HRM **CO2:** acquire the skills and knowledge of planning, recruitment, selection, placement and induction **CO3**: demonstrate the techniques for training and development **CO4:** understand the concept compensation, job evaluation and wage salary administration **CO5:** analyze the strategies to evaluate the performance of employees
PROGRAMING IN JAVA	**CO1**: identify the properties and features of Object Orientations using JAVA **CO2**: analyze the name space, Exception conditions standard library functions in JAVAusing package and Exception handling. **CO3**: employ Utility and concurrency conditions in JAVA for complex and container types of problems **CO4**: apply Input / Output functions and java based applications with file manipulations, user interface and database connectivity. **CO5**: develop GUI and Network programming applications using swing and networking packages.
DATA BASE SYSTEM	**CO1:** understand the fundamentals of database system **CO2:** design and create tables in database and execute queries. **CO3:** design database based on a data models using normalization. **CO4:** apply transaction concept **CO5:** illustrate database system architecture and distributed database
DATA STRUCTURES AND ALGORITHMS	**CO1**: describe stack, queue and linked list operation. **CO2:**choose appropriate data structure as applied to specified problem definition. **CO3:** manipulate the operations on various data structures. **CO4:** apply the concepts learned in algorithms to various domains **CO5:** use linear and non-linear data structures
COMPUTER NETWORKS	**CO1:** comprehend the basic types of networks, its classifications and properties of OSI and TCP/IP reference models **CO2**: acquire the design of the Data Link Layer with Data Link layer Protocols. **CO3:** apply various routing algorithms to find the shortest paths between two nodes. **CO4:** recognize the Transport Layer with TCP/IP and UDP protocols. **CO5:** investigate the Application Layer functionalities using Protocols like SNMP, WWW, FTP, MIME and security

JAVA LAB	**CO1**: apply the concepts of Java to solve simple problems. **CO2**: develop, execute and troubleshoot programs using networking concepts. **CO3**: design and develop multi-tier applications using JDBC **CO4:** build simple applications using JAVA
DATA BASE LAB	**CO1:**design and implement database schema for the given problem **CO2:**populate and query using DDL,DML,DCL,TCL **CO3:**prepare SQL reports, create implicit and explicit cursor and implement triggers, procedures and function **CO4:** generate a normalized database for the given real life application
STATISTICS AND LINEAR PROGRAMMING	**CO1:**illustrate different types and functions of random variables and probability distributions **CO2:** apply discrete and continuous distributions to solve the given applications **CO3:** categorize and apply various types of hypothesis and errors **CO4:** employ regression and correlation to find the relation between variables and solve problems using time series analysis **CO5:** solve problems using linear programing techniques
SCRIPTING LANGUAGES(Java Script, JQuery, Angular JS, Node JS)	**CO1**: describe Java Script functionalities in creating web page **CO2**: Develop pages using JQuery **CO3**: illustrate UI design and maintains it in database **CO4**: employ Nodjs to create server side application **CO5**: Design effective UIs
WEB DESIGN AND DEVELOPMENT [PHP, MySQL, AJAX, JOOMLA]	**CO1**: Summarize the technologies required for the web development **CO2**: Develop simple programs using php **CO3**: interpret MySQL functions with php to maintain the database **CO4**: Relate Ajax with WAMP **CO5**: Organize web site and publish through CMS
DATA MINING AND WAREHOUSING	**CO1:** preprocess the data using various preprocessing techniques **CO2:** generate association rules using Apriori and FP-growth algorithms **CO3:** predict the class label of a given tuple using the classification techniques **CO4:** group the data using the basic clustering techniques **CO5:** summarize the concepts of warehouse, its architecture and multidimensional data models.
SCRIPTING LAB	**CO1:** Create UI designs with validations using JavaScript **CO2:** design and develop attractive web pages **CO3:** analyze and apply events and execute scripts with server **CO4:** build dynamic website using different scripting concepts
WEB DESIGN LAB	**CO1:** develop simple PHP scripts **CO2:** create simple web pages using HTML and PHP. **CO3:** design and develop interactive pages using HTML, PHP and MySQL **CO4:** build interactive web pages using PHP, MySQL, Ajax and JQuery.
ACCOUNTING	**CO1:** recognize the basics of concepts and conventions of accounting **CO2:** apply accounting principles to practice the preparation of journal, ledger

AND FINANCIAL MANAGEMENT	and Trail balance preparation **CO3:** identify the financial position of the business concern **CO4:** analyze budgeting and its control **CO5:** understand the concepts of capital budgeting
SERVICE ORIENTED ARCHITECTURE	**CO1:** illustrate the software architecture, enterprise wide SOA, SOApatterns and SOA programming models. **CO2:** analyze the design, technologies and benefits of SOA **CO3:** relate the technologies and describe the implementation of SOA and Amazon Web Services Components. **CO4:** explain the meta data management and web services security. **CO5:** Analyze the transaction processing and web services security.
COMPUTER GRAPHICS	**C01**: interpret two dimensional graphics. **C02**: apply two dimensional transformations. **CO3**: analyze three dimensional graphics and **CO4**: apply three dimensional transformations. **CO5**: describe clipping techniques to graphics.
MOBILE COMPUTING	**CO1**: explain mobile computing basics and technologies **CO2**: categorize WIFI standards and deployment of WIFI **CO3**: illustrate mobile network packet delivery and management **CO4**: summarize the protocols of transport layer over conventional transport layer **CO5**: justify different types of mobile OS.
COMPETENCY BUILDING	**CO1:** develop simple console based games **CO2:** design and develop games using sequences **CO3:** demonstrate the usage of files and pattern matching **CO4:** apply OOP concepts in creating attractive games **CO5:** build interactive games using pygame
DISTRIBUTED PROGRMMING USING J2EE	**CO1**: identify distributed hardware and software architecture and distributed environment **CO2**: identify RMI architecture and Java Servlets, apply the same to develop various applications using RMI and Servlets **CO3**: apply the concepts of Java Server Pages to write various real time web based distributed applications **CO4**: build applications in J2EE server using Java Servlets and Java Server Pages using J2EE architecture **CO5**: design distributed applications that run on EJB server using Session and Entity bean with Enterprise Java Beans (EJB), its architecture

SOFTWARE ENGINEERING	**CO1**: Explain various process models for a software project development **CO2**: Classify the requirements and prepare SRS **CO3**: Create architectural design, Data flow Design and procedural design **CO4**: Estimate time, cost and effort for the specific software to be developed **CO5**: Apply different testing techniques to test the software and Create test plans and strategies **CO6**: Summarize various reengineering process and Quality concepts for quality assurance
GAME DEVELOPMENT LAB	**CO1**: design console based simple games **CO2:**analyze and develop game applications using sequences **CO3**: apply OOP concepts to develop game applications **CO4:**design and develop real world game applications using pygame
J2EE LAB	**CO1**: Design various real time applications using RMI **CO2:** employ Java Servlets to develop various real time web based distributed applications. **CO3**: Build applications in J2EE server using Java Server Pages **CO4:** Design and develop distributed applications that run on EJB server using Session and Entity bean
INTERNET Of THINGS	**CO1:** analyze the basics of IoT **CO2:** interpret web services to access/control IoT devices **CO3:** apply an IoTin heterogeneous environment **CO4:** relate cloud services and IoT **CO5**: Analyze applications of IoT in real time scenario
EMBEDDED SYSTEMS	**CO1:**interpretthe components of embedded system **CO2:** classify various devices **CO3:** analyze functions of various units **CO4:** acquire the knowledge of real time operating system and implement real time functions **CO5:**understand embedded system development and tools
MACHINE LEARNING	**CO1:** Identify learning problems, various concept learning methods **CO2:**outline the representation of neural networks and various algorithms **CO3:**Describe bayes theorem, bayes optimal and naïve bayes classifier and Bayesian belief network **CO4:** Interpret case based learning **CO5:** Identify various advanced learning methods
CYBER SECURITY	**CO1** infer Vulnerabilities in information systems and organization **CO2:a**nalyzing Risks and Securing them **CO3:** summarize the role and responsibilities of CIO **CO4:**describe IDPS and cyberspace defense **CO5:**distinguish cyber law and security
FUNCTIONAL	**CO1**: define algebraic data types and pattern matching **CO2**: describe functional programming

PROGRAMMING	**CO3**: illustrate file processing **CO4**: describe the functions of clojure **CO5**: predict macros and utilize Java and JVM
CODING SKILL	**CO1**: understand the Application Architecture, lifecycle, configuration files, etc. **CO2:**illustrate various application components like Activities, Fragments, and Content Provider etc. **CO3:** design the User Interface. **CO4:**write simple mobile applications. **CO5:** generate the APK and Publishing it on Android Market.
.NET PROGRAMMING	**CO1:** utilize the features of Dot Net Framework along with the features of C# **CO2:** apply ASP.NET to design web applications **CO3:** use ASP.NET controls in web applications. **CO4:** debug and deploy ASP.NET web applications **CO5:** create database driven ASP.NET web applications and web services
COMPILER DESIGN	**CO1**: classify various types of translators and its functions and identify phases of compiler **CO2**: design lexical analyzer and identify the similarities and differences among different parsing techniques **CO3**: formulate the different representation of intermediate code **CO4**: utilize parsers and symbol tables to identify errors from different phases **CO5**: explain the conversion of optimized code to object code.
MOBILE APPLICATION DEVELOPMENT LAB	**CO1**: design User Interface using various components **CO2:** implement applications with database **CO3:** write applications with multimedia objects **CO4:**build the given simple applications with action and alert dialogs
.NET LAB	**CO1:** design and develop user interfaces **CO2**:implement different controls **CO3:** create a database and access it using ADO.NET **CO4**: build simple web applications
CLOUD COMPUTING	**CO1:**recognise various types of clouds service and deployment models **CO2:** acquire cloud computing architecture **CO3:** identify and analyze basic cloud collaborating applications **CO4:** identify and Analyze advanced cloud collaborating applications **CO5:** summarize Cloud security and its importance to real time applications
DIGITAL IMAGE PROCESSING	**CO1:** explain the fundamentals of digital image **CO2:** apply various methods and techniques to enhance the image **CO3:** classify the techniques for filtering and segmentation **CO4:** classify compression, decompression techniques and standards. **CO5:** illustrate image representation and pattern matching

SOFTWARE TESTING	**CO1**: explain testing life cycle models **CO2:** distinguish different testing techniques **CO3:**illustrate test plans and test cases preparation **CO4**: apply the test cases to verify and validate the software product **CO5:** choose tools for test automation
BIG DATA ANALYTICS	**CO1**: Analyze evolution and concepts of big data **CO2:**Predict mining data from data sets using various methods and techniques **CO3:**Outline Hadoop and Mapreduce functions and its environment **CO4**: Explain different working principles of Mapreduce **CO5:**Formulate Hadoop cluster and select appropriate tool
COMPUTER FORENSICS	**CO1**: describe forensics evolution, type and benefits **CO2:** explain the workstation selection and data acquisition **CO3:** handle file systems and registry **CO4:** analyze various tools **CO5:** familiar with different forensics and ethics
SOFTWARE PROJECT MANAGEMENT	**CO1:** explain conventional software management and software economics **CO2:** illustrate Project management framework **CO3:** describe process planning, project organizations and process automation **CO4:** familiar with software management disciplines **CO5:** Identify various risk management policies