Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore –560 019.

Calendar of Events for the Academic Year 2023- 2024

Sl. No.	Date	Events
1.	05.08.2023	Inauguration of First Year UG Classes
2.	09.08.2023	Special Lecture on Machine learning system development lifecycle by Dr. Sajjan G Shiva, Distinguished professor, University of Memphis, United States of America
3.	14.08.2023	Special Talk on Intellectual Property Rights by PG (Economics) Resource Person: Dr. Ramesh Shahabadkar, professor, AMC college of Engineering
4.	31.08.2023	30 Hrs. crash course for competitive examination preparations
5.	02.10.2023	"Swachhta Hi Seva Abhiyan" 154th Birth Anniversary of Mahatma Gandhi celebration
6.	16.10.2023	Inauguration of the Cultural, Sports, NCC, NSS and YRC activities
7.	18.10.2023 to 20.10.2023	First Internal Assessment Test for II, IV and VI Semester UG Students
8.	06.11.2023	Inauguration of First Year PG (Economics) Classes
9.	10.11.2023	National Conference on "Socio-Economic strategies for empowering vibrant India"
10.	17..11.2023	"Kannada Rajothsava" Celebration
11.	25.11.2023	"Inter collegiate Debate Competition"

12.	28.11.2023	"Constitution Day" Celebration
13.	04.12.2023 to 06.12.2023	Second Internal Assessment Test for II, IV and VI Semester UG Students
14.	09.12.2023	"Parents Mentor Ward Meeting"
15.	06.12.2023	"Voters Awareness and Enrolment Drive" in association with BBMP, Basavangudi
16.	22.12.2023	"National Mathematics Day Dec- 2023" Celebration
17.	29.12.2023	"ವಿಶ್ವ ಮಾನವ ದಿನಾಚರಣೆ" by Department of Kannada
18.	04.01.2024	World Braille Day Celebration
19.	06.01.2024	"Preparation Strategy for Competitive Exam and Tips for being Successful by Placement Cell
20.	12.01.2024	"Workshop on "Today's Youth for Yesterday's Youth" on the occasion of National Youth Day Celebration
21.	25.01.2024	"National Voter's Day Celebration
22.	26.01.2024	"75th Republic Day Celebration"
23.	08.02.2024	Special Lecture on "Academic Stress and Exam Anxiety" by Sumana Counselling Centre
24.	16.02.2024	"ರಥಸಪ್ತಮಿ ಯೋಗ ಉತ್ಸವ"
25.	24.02.2024	"Books Exhibition" by Library and Information Centre
26.	26th Feb to 13th April 2024	I, III and V Semester Bengaluru City University NEP UG and PG Examinations
27.	28.02.2024	"Anatha Tharanga- 2024" National Science Day Celebration

28.	09.03.2024	"International Women's Day Celebration
29.	18.03.2024 to 23.03.2024	"One Week Faculty Development Program" on Trends in AI and ML
30.	15.04.2024 to 21.04.2024	"NSS Annual Camp"
31.	30.04.2024	"Dr. B. R. Ambedkar Jayanthi" Celebration
32.	23.05.2024	Special Talk on Power Supply for Beginners by Department of Physics
33.	25.05.2024 to 01.06.2024	"One Week Pre-Placement Training" By Placement Cell
34.	27.05.2024 to 27.05.2024	First Internal Assessment Test for II, IV and VI Semester UG Students
35.	01.06.2024	"Parents Mentor Ward Meeting"
36.	03.06.2024 to 08.06.2024	"Anantha Tharanga Cultural Week- 2024"
37.	05.06.2024	"World Environment Day Celebration"
38.	10.06.2024 to 14.06.2024	"Inter Class Sports Competitions"
39.	19.06.2024	"Campus Placement Drive"
40.	21.06.2024	"Annual Athletic Meet- 2024"
41.	26.06.2024	"Blood Donation Camp"
42.	27.06.2024 to 29.06.2024	Second Internal Assessment Test for II, IV and VI Semester UG Students
43.	01.07.2024	"College Day Celebration- 2024"

44.	02.07.2024	End of II, IV and VI Semester UG Classes
45.	July- 2024 to Aug- 2024	II, IV and VI Semester Bengaluru City University NEP UG and PG Examinations

5/8/23

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

ಬೆಂಗಳೂರು ನಗರ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
BENGALURU CITY UNIVERSITY
Central College Campus, Dr.B.R. AmbedkarVeedhi, Bengaluru – 560 001.
Ph.No: 080-22961016/ 22131385, E-mail ID: registrar@bcu.ac.in

NO:BCU/ACA/Cal of Eve-PG/08/2023-24 Date:27.10.2023

Revised Notification

Sub: Calendar of Events of Post Graduate courses for the Academic year 2023-24

Ref: 1.ಸರ್ಕಾರಿ ಆದೇಶ ಸಂ.ಇಡಿ 80 ಯುಎನ್‌ಇ2023, ದಿನಾಂಕ:25.05.2023

2. ನಂ:ಬಿಸಿಯು/ಶೈಕ್ಷಣಿಕ/ಸ್ನಾ/ಸ್ನಾಕೋ/02/ವೇ.ಪ/2023-24 (ಶೈಕ್ಷಣಿಕ ವೇಳಾಪಟ್ಟಿ ಸಮಿತಿ ಸಭೆ) ದಿನಾಂಕ:17.08.2023
3. No:Bcu/Aca/Cal of Eve-PG/08/2023-24 Dated: 22.08.2023
4. Approval of the Vice-Chancellor Dated:26.10.2023

*****

The Calendar of Events of Post Graduate Courses as per reference No (3) cited above, the admission Committee held on 19.10.2023 decided to revise the calendar of events for the Academic year 2023-24 is notified as below:

Sl. No.	Academic Activity (2023-24)	Dates
1	Commencement of I &III Semester Classes	16.11.2023
2	End of I &III Semester Classes	15.03.2024
3	Commencement of I &III Semester Practical and Theory Examinations	25.03.2024 To 20.04.2024
4	**Vacation*** Examination (Practical & Theory), Valuation and Results	15.03.2024 to 25.04.2024
5	Commencement of II & IV Semester Classes	02.05.2024
6	End of II & IV Semester Classes	31.08.2024
7	Commencement of II & IV Semester Practical and Theory Examinations	10.09.2024 to 30.09.2024
8	**Vacation*** Examination (Practical & Theory), Valuation and Results	10.09.2024 To 25.09.2024
*Teachers on vacation should take up the assigned examination work including valuation		

By order

Registrar

13/3/24

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

ಬೆಂಗಳೂರು ನಗರ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
BENGALURU CITY UNIVERSITY
ಸೆಂಟ್ರಲ್ ಕಾಲೇಜು ಆವರಣ, ಡಾ ಬಿ.ಆರ್. ಅಂಬೇಡ್ಕರ ವೀಧಿ, ಬೆಂಗಳೂರು– 560 001.
Ph.No.080-22961016 / 22131385 E-Mail ID: registrar@bcu.ac.in

No.BCU/ACA/Cal of Eve-UG/ 02 /2023-24 Date:26.05.2023

NOTIFICATION

Sub: Calendar of Events for Under Graduate Courses for the academic year 2023-24.

Ref: 1. ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆಇಪಿ/217/ಯುಎನ್‌ಎ/2022 ದಿನಾಂಕ:09.07.2022
2.ಉಪಾಧ್ಯಕ್ಷರು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಉನ್ನತ ಶಿಕ್ಷಣ ಪರಿಷತ್ತು, ಇವರ ಟಿಪ್ಪಣಿ ದಿನಾಂಕ:18.02.2023
3. Approval of the Vice-Chancellor Dated:26.05.2023

*****

The calendar of events for B.A, B.Sc /B.Sc(FAD)/ BCA /B.Com/ BBA/ BHM /BVA/ BTTM , Under Graduate Course of the Academic year 2023-24 is notified as here under:

Sl.No	Academic Activity	Dates
01	Commencement of Ist Semester Admission	22.05.2023
02	Last date for admission to Ist Semester without penal fee	15.07.2023
03	Last date for admission to Ist Semester with penal fee	31.07.2023
04	Commencement of Ist Semester Classes	17.07.2023
05	End of Ist Semester Classes	18.11.2023
06	Commencement of Ist Semester Practical and Theory Examinations	20.11.2023
07	**Vacation*** Examination (Practical & Theory), Valuation and Results	20.11.2023 to 15.01.2024
08	Commencement of IInd Semester Classes	16.01.2024
09	End of IInd Semester Classes	11.05.2024
10	Commencement of IInd Semester Practical and Theory Examinations	13.05.2024
11	**Vacation*** Examination (Practical & Theory), Valuation and Results	16.05.2024 to 29.06.2024

***Teachers on vacation should take up the assigned examination work including valuation**

By order

Registrar

To,
The Principals of UG Affiliated Colleges of Bengaluru City University.

Copy to:
1. The Deans, Faculties of Arts, Science, Commerce & Management, Bengaluru City University, Bengaluru.
2. The Officer on special duty to the Hon'ble Minister for Higher Education, Vidhana Soudha, Bengaluru, for kind information
3. P.A. to the Principal Secretary to the Govt. Higher Education, 6th Floor M.S. Building, Dr. Ambedkar Veedhi, Bengaluru -560 001, for kind information.
4. PA to Vice-Chairman, Karnataka State, Higher Education Council, Palace Road, Bengaluru
5. Ps to VC / Registrar (Evl) / PA to Fo, Bengaluru City University, Bengaluru.

PRINCIPAL
APS College of Arts & Science
R. Colony, Bangalore-560 019.

ಬೆಂಗಳೂರು
ನಗರ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
BENGALURU
CITY UNIVERSITY
ಸೆಂಟ್ರಲ್ ಕಾಲೇಜು ಆವರಣ, ಡಾ॥ ಬಿ.ಆರ್. ಅಂಬೇಡ್ಕರ್ ವೀಧಿ, ಬೆಂಗಳೂರು– 560 001.
Ph.No.080-22961016 / 22131385 E-Mail ID: registrar@bcu.ac.in

No.BCU/ACA/Cal of Eve-UG/ 02 /2023-24 Date:01.12.2023

REVISED NOTIFICATION

Sub: Revised Calendar of Events for Under Graduate Courses for the academic year 2023-24.

Ref: 1.ಸರ್ಕಾರಿ ಆದೇಶ ಸಂ.ಇಡಿ 80 ಯುಎನ್‌ಇ2023, ದಿನಾಂಕ:23.05.2023

2. No:BCU/Aca/Cal of Eve-UG/02/2023-24 Date:26.05.2023
3. ನಂ:ಬಿಸಿಯು/ಶೈಕ್ಷಣಿಕ/ಸ್ನಾ/ಸ್ನಾಕೋ/02/ಪೀ.ಪ/2023–24 (ಶೈಕ್ಷಣಿಕ ಪೀಳಾವಟ್ಟಿ ಸಮಿತಿ ಸಭೆ)ದಿನಾಂಕ:17.08.2023
4. No:BCU/Aca/Cal of Eve-UG/02/2023-24 Date:22.08.2023
5. ನಂ:ಬಿಸಿಯು/ಶೈಕ್ಷಣಿಕ/ಸ್ನಾ/ಸ್ನಾಕೋ/02/ಪೀ.ಪ/2023–24 (ಶೈಕ್ಷಣಿಕ ಪೀಳಾವಟ್ಟಿ ಸಮಿತಿ ಸಭೆ)ದಿನಾಂಕ:15.11.2023
6. Approval of the Vice-Chancellor Dated:01.12.2023

*****

The Revised calendar of events for B.A, B.Sc /B.Sc(FAD)/ BCA /B.Com/ BBA/ BHM /BVA/ BTTM under graduate courses as per reference No (5) cited above, decided by the Committee of the calendar of events for the Academic year 2023-24 is notified as below:

Sl.No.	Academic Activity	Dates
01	Commencement of I Semester UG Admission	25.05.2023
02	Last date for admission to I Semester without penal fee	15.07.2023
03	Last date for admission to I Semester with penal fee	31.08.2023
04	Commencement of I Semester Classes	27.07.2023
05	End of I Semester Classes	07.12.2023
06	Commencement of I Semester Practical Examinations	01.12.2023
07	**Vacation*** (for I Semester 2023-24 batch) Examination Practical & Theory, Valuation and Results (2022-23 batch)	01.09.2023 to 24.09.2023
08	Re-opening of I, III,V &VII Semester Classes	03.10.2023
09	End of I, III, V & VII Semester Classes	10.01.2024
10	Commencement of I Semester (Theory Examinations) Commencement of III,V,&VII Practical & theory Semester Examinations	15.01.2024 to 15.02.2024
11	Re-opening of II,IV,VI &VIII Semester Classes	19.02.2024
12	End of II,IV,VI &VIII Semester Classes	31.05.2024

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

13	Commencement of II,IV,VI &VIII Semester (Theory Examinations)Practical& theory Semester Examinations	03.06.2024 to 06.07.2024
***Teachers on vacation should take up the assigned examination work including valuation**		

By order

Registrar

To,

1. The Registrar (Evl), galuru City University, Bengaluru
2. The Principals of UG Affiliated Colleges of Bengaluru City University, Bengaluru

Copy to:

1. The Deans, Faculties of Arts, Science, Commerce & Management, Bengaluru City University, Bengaluru.
2. The Officer on special duty to the Hon'ble Minister for Higher Education, Vidhana Soudha, Bengaluru, for kind information
3. P.A. to the Principal Secretary to the Govt. Higher Education, 6th Floor M.S. Building Dr. Ambedkar Veedhi, Bengaluru -560 001, for kind information.
4. PA to Vice-Chairman, Karnataka State, Higher Education Council, Palace Road, Bengaluru
5. Ps to VC / Registrar /Registrar (Evl) / Fo, Bengaluru City University, Bengaluru.

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

ಆರು ಅ ಅನಂತವ
BE BOUNDLESS

BENGALURU CITY UNIVERSITY

CHOICE BASED CREDIT SYSTEM

(Semester Scheme with Multiple Entry and Exit Options for Under Graduate Course- as per NEP 2020)

Syllabus for Economics
III & IV Semester

2022-23 onwards

ಪ್ರಾಧ್ಯಾಪಕರು
ಎಸ್.ಎಸ್. ಕಲೆ ಮತ್ತು ವಾಣಿಜ್ಯ ಕಾಲೇಜು
ಎಸ್.ಆರ್. ಕಾಯೋಜಿ, ಬೆಂಗಳೂರು-19

Semester III

Course Title:	Microeconomics		
Course Code:	DSC-3.1	No. of Credits	3
Contact hours	42 Hours	Duration of SEA/Exam	2 hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Outcomes (COs): After successfully completing the course, the student will be able to:

CO1. Understand introductory economic concepts

CO2. Recognize basic supply and demand analysis.

CO3. Recognize the structure and the role of costs in the economy.

CO4. Describe, using graphs, the various market models: perfect competition, monopoly, monopolistic competition, and oligopoly.

CO5. Explain how equilibrium is achieved in the various market models.

CO6. Identify problem areas in the economy, and possible solutions, using the analytical tools developed in the course.

Contents			42 Hrs.
Syllabus- Course 5: Title- Microeconomics			**42 Hrs.**
Unit 1	**Basics of Microeconomics**		**14 hours**
	Chapter 1	**Some Concepts of Microeconomics** Scarcity and Choice; Opportunity cost; Production possibility frontier; Price mechanism v/s state intervention Types of Goods (Free Goods, Economic Goods, Public and Private goods, Common Property Resources, Club goods).	6 hrs.
	Chapter 2	**Consumption decision:** Indifference curves – Meaning and Properties;budget constraint; Consumer's Equilibrium; Price, income and substitution effects; Derivation of Demand Curve from Indifference Curves; Revealed Preference Theory; Choice between leisure and income.	8 hrs.
Practicum:			

➢ Prepare assignment on Consumer's equilibrium through indifference curve analysis ➢ Seminar on Concepts of Micro Economics ➢ Conducting a consumer survey to understand their tastes and preferences			
Unit -2:	**Production and Costs**		**14 hours**
	Chapter 3	**The Firms:** Concept of firm and Industry; Production Function with Two variable inputs: Properties of Isoquant, isocost line and least cost combination of inputs; Production function with all variable inputs (Returns to Scale); Features of Cobb-Douglas Production Function	8 hrs.
	Chapter 4	**Cost of Production:** Cost function and estimation: Linear and Non-Linear (cubic and quadratic) and applications; Economies and Diseconomies of scale	6 hrs.
Practicum: ➢ Group Discussion on Economies and Diseconomies of scale ➢ Project work on cost functions and cost estimations			
Unit -3:	**Price Determination of products and factors**		**14 hours**
	Chapter 5	**The Markets -I:** Perfect Competition: Price determination of an industry under different time periods and equilibrium of firm under short run and long run; (some numerical exercises) Monopoly pricing and price discrimination; (some numerical exercises)	4 hrs
	Chapter 6	**The Markets-II:** Pricing under Monopolistic Competition; equilibrium of firm under product differentiation and selling costs; Oligopoly – Interdependence and price rigidity, Collusive (Cartels and Price leadership) and non-collusive oligopoly (Cournot model); Elements of Game theory (players, strategy, Payoff matrix)	5 hrs
	Chapter 7	**The Inputs (Factors)** Functional and Personal Income; Marginal Productivity Theory of Distribution; Modern theory of distribution; Concepts related to rent, wage, interest and profit.	5 hrs
Practicum: ➢ Conducting Market Survey to identify the nature and features of markets for different goods/services ➢ Understanding the distribution of national income as factor incomes			

Pedagogy: Classroom lectures, tutorials, Problem-solving exercise

Note: Strictly follow the Practicum

References	
1	Ahuja, H.L. (2008): *Principles of Microeconomics*, S. Chand and Co., New Delhi
2	Mankiw, N. Gregory (2020) *Principles of Economics* (Ninth ed.). Boston, MA
3	Jhingan, M.L. (2016): *Microeconomics*. Vrinda Publications, New Delhi
4	Koutsoyiannis, A (1979): *Modern Microeconomics*, London, Macmillan
5	Omkarnath, G. (2012: *Economics: A Primer for India*, Orient Blackswan, Hyderabad
6	Samuelson, Paul (2004): *Economics*, McGraw-Hill, New Delhi
7	https://www.core-econ.org/the-economy/book/text/0-3-contents.html

Semester III

Course Title	Agriculture Economics		
Course Code:	DSC-3.2.2	No. of Credits	3
Contact hours	42 Hours	Duration of SEA/Exam	2 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Outcomes (COs):

After completing the course, the student will be able to:

CO1. Acquire knowledge of the role of agriculture in economic development
CO2. Acquire the theoretical and application knowledge of agricultural growth and development
CO3. To enable the students to understand the Strategy of Agricultural Development in India,
CO4. To make the students aware of institutional and non-institutional sources of agricultural Finance

Contents	42 Hrs.
Unit–I: Agriculture and Economic Development	**14 hrs.**
Chapter 1: Introduction to Agricultural Economics • Definition and scope of agricultural economics • Need for special techniques of economic analysis to deal with unique problems of the agricultural economy • Seasonality, perishability, and heterogeneity of output • The Organisation of agricultural production – Role of Land, Labour, Capital, and entrepreneurship	5
Chapter 2: Agriculture in Economic Development • Role of Agriculture in Economic Development. • Diversification of agriculture: Agriculture and allied activities (fisheries, horticulture, floriculture). • Interdependence between agriculture and industry	4
Chapter 3: Structural changes and Agriculture in India • Traditional agriculture and its modernisation • Changes in the share of agriculture to G.D.P., reasons, and way forward • Changes in the percentage of employment generated by agriculture in the total workforce-reasons and way forward	5
Practicum:	

• Visit a few nearby agricultural farms, discussing with farmers about crops grown, productivity, farm practices and the problems the farmers are facing, and the solutions. Then writing an assignment • Group Discussions on the declining contribution of agriculture to G.D.P.	
Unit – 2 Theory of agricultural growth and development	**12 Hrs**
Chapter 4: Transformation of traditional agriculture • Schultz's transformation of traditional Agriculture • Mellor Model of agricultural development	2
Chapter 5: Dual economy models and other theories • Jorgenson's Model of Development of Dual Economy • Arthur Lewis's theory of Unlimited supplies of Labour • Fei-Ranis Model of Economic growth • Todaro Model of Rural-Urban Migration and Unemployment	6
Practicum: 1. Group Discussions on various Agricultural growth and development theories. 2. Debate on the relevance of the agricultural theories in the present agricultural situation in India	4
Unit -3: Strategy of Agricultural Development in India	**16 Hrs**
Chapter 6: Land Reforms and Policy • Resource Allocation and Capital Formation. • Institutional v/s Technological Factors. • Pre-Land Reform Agrarian Scenario, • Post-Independence Agrarian Reforms, Legislation, and Implementation • Abolition of Intermediaries: Tenancy Reforms, Ceiling Legislation Implementation • Role of Technological factors in Agricultural Growth: High Yielding Varieties of Seeds, Irrigation and Water, Fertilisers, Mechanisation • Economic Reforms and Agriculture, • W.T.O. and Indian Agriculture	4
Chapter 7: Agriculture Finance • Role, Importance and features of Agricultural Finance • Basic economic principles and Criteria involved in Finance, • Need for Agriculture credit. • Estimates of Rural Financial Requirements. • The extent of Agricultural Finance • Problems of Agricultural Finance and suggestions to improve Agricultural Finance • Sources of Agricultural Finance; Institutional and Non -Institutional Credit Financing through N.A.B.A.R.D., Co-operatives, Commercial Banks and RRBs. • Money Lenders; Role, Defects, Regulations, and Reasons for money lenders still one being one of the sources. • Financial Institutions and credit flow to the rural/priority sector • Micro-Financing and Role of M.F.I's, N.G.O.'s and S.H.G.'s.	6
Chapter 8: Agricultural Marketing • Definition and need for an efficient Marketing System • Nature of Demand for Farm Products.	6

• Structure of Agricultural Product Markets. • Functions of Marketing • Present System of Indian Agricultural Marketing; Problems of Indian Agricultural Marketing • Government Measures to improve Indian Agricultural Marketing	

Practicum

1. Write an assignment on the impact of land reforms in India
2. Discuss the maximum acres of agricultural land an individual can own in Karnataka vis-a-vis other states.
3. Quiz on the strategy of agricultural development in India

Pedagogy: Classroom lectures, tutorials, Problem-solving exercises, field visit

Note: Strictly follow the Practicum

References	
1	Lekhi R K, Joginder Singh (2022), Agricultural Economics, Kalyani Publishers, New Delhi
2	Dantwala, M.L. et al. (1991), Indian Agricultural Development Since Independence, Oxford & IBH, New Delhi
3	Government of India (1976), Report of the National Commission on Agriculture, New Delhi.
4	Government of India, Economic Survey (Annual), New Delhi.
5	Gulati, A. and T. Kelly (1999), Trade Liberalization and Indian Agriculture, Oxford UniversityPress, New Delhi.
6	Reserve Bank of India, Report on Currency and Finance (Annual), Mumbai
7	Rudra, A. (1982), Indian Agricultural Economics: Myths and Reality, Allied Publishers, NewDelhi

Semester IV

Course Title	Macroeconomics		
Course Code:	DSC-4.1	No. of Credits	3
Contact hours	42 Hours	Duration of SEA/Exam	2 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

CO1: Acquire knowledge on the circular flow of income in two sectors, three and four-sector model

CO2: Understand and learn the calculation of national income

CO 3: Appreciate the classical and Keynesian theory of Employment

CO 4: Understand the concepts of multiplier and accelerator and leaning the simple Calculation on the working of Multiplier and Accelerator

CO 5: Acquire knowledge of the determinants of the Investment function.

Contents			42 Hrs.
Unit I	Introduction to Macro Economics and National Income Accounting		14 hours
	Chapter 1	Introduction to Macro Economics • Meaning, • Importance and limitation • Meaning of stock and flows	3 hrs
	Chapter 2	**Circular Flow of Income** • The importance of the circular flow model • Two sectors Model, • Three sectors Model • Four sectors Model	5 hrs.
	Chapter 3	**National Income Accounting** • National income accounting: meaning and definition-Accounting Concepts, importance, • Methods and difficulties in measuring national income-ways to increase national income- empirical problems – calculation of national income. • GNP and Quality of life- • Green accounting.	6 hrs

Practicum:

a) Assignment on the Circular flow of Income in two, three and four sector model

b) Work out the numerical exercise on the calculation of National Income

Unit 2	**Theory of Income Determination**		**20 hours**
	Chapter 4	**The Classical theory of Employment** • Features; and Assumptions • Say's Law, • Pigou's wage-price flexibility • Classical dichotomy and neutrality of money • Critical Evaluation	6hrs
	Chapter 5	Keynesian Framework • Some Basic concepts: The idea of equilibrium and identity ex-ante and ex-post concepts. • Aggregate Demand and its components • Aggregate Supply: Meaning and graphical explanation; • Effective demand	4hrs
	Chapter 6	Keynes Consumption function: • Consumption Function: Algebraic and Graphical explanation; • Marginal and Average propensity to consume • Determinants of consumption function	5hrs
	Chapter 7	Keynes's Investment function; • Investment function: • Autonomous and Induced • Determinants of Investment function: rate of interest and the marginal efficiency of capital (MEC) • Factors influencing MEC • MEI and Capital Accumulation,	5hrs
Practicum: • Graphical and Algebraic explanation of the psychological law of consumption • Seminar on the effective demand • Leaning the simple numerical calculation of MEC taking a hypothetical example			
Unit 3	**Concepts of Multiplier and Accelerator**		8 hrs
	Chapter 8	**Investment Multiplier** • Investment Multiplier: Meaning, • Assumptions • The process of working • leakages • Criticism	4 hrs
	Chapter 9	**Accelerator and Super Multiplier** • Accelerator: Meaning • Assumptions • The process of working • Limitations and Criticisms • Interaction of Multiplier and Accelerator	4 hrs

Practicum:

- Leaning the simple numerical calculation of the working of the Investment Multiplier
- Leaning the simple numerical calculation of the working of the Accelerator
- Group discussion on the interaction of Multiplier and Accelerator and its application.

References

1. Ahuja H.L. (2019), Macro Economics Theory and Policy, S. Chand and Company.
2. Branson William H. (1997), Macro Economics Theory and Policy, Harper Collins India Pvt. Ltd.
3. Dernburg and McDougal (1985), Macro Economics, McGraw Hill Education, New York
4. Gupta G.S. (2008), Macro Economics: Theory and Applications, Tata McGraw Hill Education
5. Lindauer John (2012) Macro Economics,4th Ed Universe Inc, Bloomington, USA
6. Jinghan M.L. Macro-Economic Theory, Vinda Publication Pvt. Ltd. New Delhi
7. Samuelsson Paul A. Nordhaus W.D. (2010), Macro Economics, McGraw Hill Publication
8. Seth M.L. (2017), Macro Economics, Laxminarayan Agarwal Publication

Semester IV

Course Title	**Monetary Economics**		
Course Code:	**DSC-4.2.2**	**No. of Credits**	**3**
Contact hours	**42 Hours**	**Duration of SEA/Exam**	**2 Hours**
Formative Assessment Marks	**40**	**Summative Assessment Marks**	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

CO1: Acquire knowledge of the supply and demand of Money

CO2: Understand and interest in determination theories.

CO 3: Appreciate the Implications for Monetary Management

CO 4: Understand the relationship between inflation and unemployment

CO 5: Acquire knowledge of the working of business cycles

	Contents		**42 Hrs.**
Unit 1	**Money and the Economy**		**14 Hrs.**
	Chapter 1	**Money Supply:** • Definitions of Money supply; • Money supply and Value of Money; • Classical and Keynesian views on the supply of money, • Determinants of money supply, • High-powered money, • money multiplier • The reserve ratio and deposit multiplier	6 hrs.
	Chapter 2	**Definition of money supply in India** • Money supply measures by RBI o M1, M2, M3, M4 • Liquidity Aggregates – L1, L2, and L3 • Trends of Money Supply in India	3 hrs.
	Chapter 3	**Demand for Money** • Meaning and Importance • The Classical Approach, • The Keynesian Approach, • Liquidity preference, • The Post- Keynesian Approaches • Friedman's Theory of the Demand for Money	5 hrs.

Practicum: • Work out the numerical exercise on the working of the money multiplier • Assignment on Classical and Keynesian views on the Supply of money			
Unit 2	**Module: Interest Rate theories and Interest Rates**		12 hours
	Chapter 4	**Theories of Interest Rate determination** 1. Classical Theory of Interest 2. Neo-Classical or the loanable fund's theory of interest, 3. Keynes's liquidity preference theory of interest 4. Modern theories of interest; IS-LM Curve Approach	7 hrs.
	Chapter 5	**Interest Rates** • Interest rate and investment, Income and output • Heterogeneity of Interest Rate Determination: Administered Interest Rates and Market Determined Interest Rates • Interest rates and Demand for Money	5 hrs.
Practicum: • Visit a commercial bank or cooperative bank and learn the interest rates for various loans and write an assignment • Write the assignment on interest determination theories.			
Unit 3	**Inflation, Monetary Policy and Business Cycle**		16 Hrs.
	Chapter 6	**Inflation** • Definitions of Inflation, • causes of Inflation, • Types of Inflation-demand push inflation and cost-push inflation; inflationary gap, • Effects of Inflation, • Measures to control Inflation • Relationship between inflation and unemployment- The Philips curve-short and long run	6 hrs.
	Chapter 7	**Monetary policy** • Monetary policy: Meaning, objectives • Measures of Monetary policy • The Time Lags in the Monetary Policy • The efficiency of Monetary Policy • Implications for Monetary Management. • Limitations of Monetary Policy • Monetary policy in India and control of Inflation	6 hrs.
	Chapter 8	**Business Cycles** • Meaning, • Types of the business cycle, • Features of the business cycle • Phases of the businesscycle; • Control of Business Cycles.	4 hrs.

Practicum:

- Visit the market for four successive weeks on scheduled dates and see the change in the select food items and write an assignment.
- Derive the graphical model showing the relationship between unemployment and inflation using the short-run Phillips curve and the long-run Phillips curve

References

1. Crowther Geoffrey (1940), An Outline of Money, Thomas Nelson and sons Ltd. London
2. Dernburg and McDougal (1985), Macro Economics, McGraw Hill Education, New York
3. Gupta S.B. (2010), Monetary Economics, S. Chand and Company.
4. Hanson Alvin H. (1949), Monetary Theory and Policy, McGraw Hill Publication
5. Hanson J.L. (1970), Monetary Theory and Practice, McDonald's and Evans Ltd. London
6. Schumpeter J.A. (1939), Business Cycles, McGraw Hill Publication
7. Seth M.L. (2017), Macro Economics, Laxminarayan Agarwal Publication
8. Vaish M.C. (2009). Monetary Policy, Vikas Publishing House New Delhi

ಪ್ರಾಂಶುಪಾಲರು
ಬಿ.ಬಿ.ಎಂ. ಕಲೆ ಮತ್ತು ವಾಣಿಜ್ಯ ಕಾಲೇಜು
ಎಚ್.ಆರ್. ಬಡಾವಣೆ, ಬೆಂಗಳೂರು -19

Semester III

Course Title	Rural Economics		
Course Code:	OE-3.3.1	No. of Credits	3
Contact hours	42 Hours	Duration of SEA/Exam	2 Hours
Formative Assessment Marks	40	Summative Assessment Marks	60

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. To Understand the basics of rural development,

CO2. To study the characteristics, problems, and programmes of rural redevelopmentCO3.

To study the trends and patterns of economic activities in rural areas

CO4. To study the role of infrastructural facilities and governance in rural development

CO5. To enable the students to know about the significance of rural enterprises and agricultural alliedactivities.

Contents	42 Hrs
Unit–I:	**12 Hrs**
Chapter:1 - Introduction to Rural Economy Meaning and Objectives of Rural economy Characteristics of Rural Economy Indicators of Rural Development Concepts of inclusive and sustainable development	4
Chapter:2 - Approaches to Rural Development Gandhian Model Community Development Approach, Minimum Needs Approach, Integrated Rural Development and Inclusive Growth Approach.	4

Chapter:3 - Poverty and Unemployment in Rural India Meaning and Measurement of Poverty Causes of Poverty Farm and Non-Farm Employment Measurement and Types of Employment Review of Poverty Alleviation and Employment Generation Programmes in India	4
Practicum: • Field visit to a nearby village and study the poverty situation • Field visit to the village and study the employment pattern Undertake an evaluation study on employment generation programmes and prepare an assigoment.	
Unit -2:	**14 Hrs**
Chapter 4- Rural Enterprises Meaning and Importance, Classification of MSME Progress and Problems of MSME Khadi and Village Industries	5
Chapter 5: Rural Banking and Finance Credit Co-operative Societies Regional Rural Banks Role of NABARD Microfinance Institutions	4
Chapter-6: Rural Infrastructure Educational and Health Infrastructure Housing and Sanitation Drinking Water Supply Rural Transport and Communication**Rural Electrification**	5
Practicum: • Write an assignment on Rural Infrastructure • Write a report on rural industries	
Unit -3:	**14 Hrs**
Chapter 7- Rural Development Programmes Wage Employment Programmes Self-employment and Entrepreneurship Development Programmes Rural Housing Programmes Rural Sanitation Programmes	**4**

Chapter 8 - Rural Markets Meaning and Types of Rural Markets Defects and Government Measures for Removal of Defects in rural markets Co-operative Marketing Societies Meaning and Importance of Regulated Markets Digital Marketing(e-NAM)	5
Chapter 9 - Rural Governance Legislations powers, Functions, and sources of revenue of Panchayat Raj Institutions Role of NGOs in rural development People's participation in rural development	5

Practicum:

- Group Discussion on Rural Governance
- Interview Gram Panchayat members and prepare a brief note on their participation in rural development.
- Undertake an evaluation study on rural development programmes and prepare an assignment.

References

1	Chambers, R. (1983): Rural Development: Putting the Last First, Longman, Harlow.
2	Dandekar, V.M. and N. Rath (1971): Poverty in India, GIPE, Pune.
3	Dantwala, M. L. (1973): Poverty in India: Then and Now, 1870-1970, Macmillan, Bombay.
4	Gupta. K .R. (Ed) (2003): Rural Development in India, Atlantic Publishers and Distributors, New Delhi.
5	Jain, Gopal Lal (1997): Rural Development, Mangal Deep Publications, Jaipur.
6	Singh, Katar (1986): Rural Development: Principles, Policies and Management, Sage Publications, New Delhi, (Second Edition).
7	Katalay, G. N. (2005): Integrated Approach to Rural Development: Policies, Programmes and Strategies, Concept Publishing Company, New Delhi.
8	Maheshwari, S. R. (1985): Rural Development in India, Sage, Publications New Delhi.
9	Satya Sundaram, I. (1997): Rural Development, Himalaya Publishing House, Delhi.
10	Mehta, Shiv R. (1984): Rural Development Policies and Programmes, Sage Publications, New Delhi.
11	Tyagi, B. P. (1998): Agricultural Economics and Rural Development, Jai Prakash Nath and Co., Meerut.

2. Arthashastra of Kautilya by Sri. Vacaspati Gairola, Chaukhambha Vidyabahavan, Varanasi, India, 2013.
3. Kautilya, The Arthashastra by L.N. Rangarajan, Penguin Books Ltd, London.
4. Kautilya's Arthashastra: The Way of Financial Management and Economic Governance, Jaico Publishing House, Mumbai, India.

Semester 1

Course Title: **OEC 1.3.2: Indian Economy Prior to Economic Reforms (OEC)**	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Pre-requisite(s): *12th Standard Pass*

Course Outcomes (COs):

At the end of the course the student should be able to:

i. Trace the evolution of Indian Economy
ii. Identify the structural features and constraints of the Indian economy
iii. Evaluate planning models and strategy adopted in India
iv. Analyze the sector specific problems and contributions towards overall economic growth
v. Review various economic policies adopted

Unit	Description	Hours
I	**Features and problems of Indian Economy**	15
	Chapter 1: Features of Indian Economy • India as a developing economy, • Demographic features • Human Development (HDI), • Problems of Poverty, Unemployment, Inflation, income inequality	4
	Chapter 2: Issues in Agriculture sector in India • Land reforms • Green Revolution • Agriculture marketing in India • Agricultural price policy	6
	Chapter 3: Industrial and Service Sector • Industrial development; • Micro, Small and Medium Enterprises, • Industrial Policy • Performance of public sector in India, • Service sector in India. **Practicum:** 1. Identifying economic problems and their causes; 2. Mini-project on any aspect of Indian agriculture, industry, service and public sectors	5
II	**Economic Policies**	13
	Chapter 4: Planning • Mixed Economy	5

ಪ್ರಾಧ್ಯಾಪಕರು
ಎ.ಪಿ.ಸಿ.ಎಸ್. ಕಲೆ ಮತ್ತು ವಾಣಿಜ್ಯ ಕಾಲೇಜು
ಬಿ.ಹೆಚ್.ಆರ್. ಬಡಾವಣೆ, ಬೆಂಗಳೂರು-೪೨

	• Bombay Plan • Gandhian Model • Nehru Mahalanobis Model • Objectives and achievements of economic planning in India **Chapter 5: Monetary policy in India** • Instruments of Monetary Policy • Black money in India – Magnitude and Impact **Chapter 6: Fiscal Policy in India** • Tax Revenue • Public expenditure • Budgetary deficits • Fiscal reforms • Public debt management and reforms • Centre state Finance Relations and Finance commissions in India. **Practicum:** Assignment on successes and failures of India's planning; Monetary and Fiscal Policy instruments	2 6
III	**External sector and Nature of Reforms in India**	**14**
	Chapter 7: India's foreign trade • Salient features • Value, composition and direction of trade • Balance of payments • Goal of self-reliance based on import substitution and protection • Tariff policy • Exchange rate **Chapter 8: Post-1991 strategies** • Stabilisation and structural adjustment packages • Liberalisation Privatisation Globalisation (LPG) Model • Impact of LPG Policies on Indian Economy **Chapter 9: NITI Ayog** • Organization • Functions Practicum: Calculation of BoP and evaluating trade policies; Assignment and group discussion on the impact of LPG Policies	6 6 2

Suggested Readings:

1. Dutt Ruddar and K.P.M Sundaram (2001): Indian Economy, S Chand & Co. Ltd. New Delhi.
2. Mishra S.K & V.K Puri (2001) "Indian Economy and –Its development experience", Himalaya Publishing House.
3. Kapila Uma: Indian Economy: Policies and Performances, Academic Foundation
4. Bardhan, P.K. (9th Edition) (1999), The Political Economy of Development in India, Oxford University Press, New Delhi.
5. Jalan, B. (1996), India's Economic Policy- Preparing for the Twenty First Century, Viking, New Delhi.

Semester II

Course Title: **OEC 2.3.1: Contemporary Indian Economy**	
Total Contact Hours: 42	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Pre-requisite(s):

Course Outcomes (COs):

At the end of the course the student should be able to:

vi. Understand the current problems of Indian Economy
vii. Identify the factors contributing to the recent growth of the Indian economy
viii. Evaluate impact of LPG policies on economic growth in India
ix. Analyze the sector specific policies adopted for achieving the aspirational goals
x. Review various economic policies adopted

Content of Course	42 Hrs
Unit – 1 LPG POLICIES, ECONOMIC REFORMS AND AGRICULTURE	14
Chapter No. 1 Recent Issues • Genesis and Impact of LPG • India's population policy • Demographic Dividend • India's human development in global perspective	4
Chapter No. 2 Urbanization and governance • Urbanization and Smart City Mission • Informal sector • Impact of COVID-19 Pandemic • Atma Nirbhara Bharat Abhiyan	4
Chapter No. 3 Economic Reforms and Agriculture • Agriculture and WTO • Price policy and Subsidies • Commercialisation and Diversification • Public Distribution System • Impact of public expenditure on agricultural growth • Agrarian Crisis, Doubling Farm Incomes, MGNREGS	6
Practicum 3. Mini-project to ascertain the impact of pandemic on lives of different sections of population 4. Field visits to understand the agrarian situation	
Unit – 2 INDUSTRY, BUSINESS, FISCAL POLICY	14
Chapter No. 4. Industrial Policy • New Industrial Policy and changes • Public sector reform • Privatisation and Disinvestment • Competition Policy	4

Chapter No. 5. Business • Ease of Doing Business • Performance of MSMEs • Role of MNC's in Industrial Development • Make in India, development of economic and social infrastructure • National Monetization Pipeline (The teacher should include the latest policy of the government) **Chapter No. 6. Fiscal Policy** • Tax, Expenditure, Budgetary deficits • Pension and Fiscal Reforms • Public debt management and reforms • Fiscal Responsibility and Budget Management (FRBM) Act • GST, Fiscal Federalism and Fiscal Consolidation • Recommendations of the Current Finance Commission **Practicum**: Mini-projects to assess the business climate	5 5
Unit – 3 MONETARY POLICY, FOREIGN TRADE AND INVESTMENT	14
Chapter No. 7 Monetary Policy • Organisation of India's money market • Financial sector reforms • Interest rate policy • Review of monetary policy of RBI **Chapter No. 8.** Money and Capital Markets • Working of SEBI in India • Changing roles of the Reserve Bank of India • Commercial banks, • Development Finance Institutions • Foreign banks and Non-banking financial institutions • Analysis of price behaviour in India, Anti-inflationary measures • Demonetization and its impact **Chapter No. 9. Foreign Trade and Investment** • India's foreign trade • India Balance of payment since 1991 • New Exchange Rate Regime: Partial and full convertibility • Capital account convertibility • FDI – Trends and Patterns • New EXIM policy, WTO and India • Bilateral and Multilateral Trade Agreements and Associations **Practicum**: 3. Computation and analysis of Wholesale Price Index, Consumer Price Index: components and trends. 4. Group Discussions on India's trade policies and trade agreements **References** • Bardhan, P.K. (9th Edition) (1999), The Political Economy of Development in India, Oxford University Press, New Delhi. • Bhaduri Amit, (2015), A Model of Development By Dispossession, Fourth Foundation • Byres Terence J. (ed.), (1998), The State, Development Planning and Liberalisation in India, Delhi, OUP • Dutt Ruddar and K.P.M Sundaram (2001): Indian Economy, S Chand & Co. Ltd. New Delhi.	3 5 6

- Frankel Francine R., (2004), India's Political Economy, Delhi. OUP Jenkins Rob, 2000, Economic Reform in India, Cambridge, CUP
- Jalan, B. (1996), India's Economic Policy- Preparing for the Twenty First Century, Viking, New Delhi.
- Joshi Vijaya and I.M.D. Little, (1998), India's Economic Reform 1991-2001, Delhi, OUP.
- Kapila Uma: Indian Economy: Policies and Performances, Academic Foundation
- Mishra S.K & V.K Puri (2001) "Indian Economy and –Its development experience", Himalaya Publishing House.
- Mukharji Rahul (ed.) (2007), India's Economic Transition: The Politics of Reforms, edited by Rahul Mukherji, Oxford University Press , New Delhi.
- Stuart and John Harris, (2000), Reinventing India, Cambridge Polity

ಪ್ರಾಂಶುಪಾಲರು
ಎ.ಪಿ.ಎಸ್. ಕಲೆ ಮತ್ತು ವಾಣಿಜ್ಯ ಕಾಲೇಜು
ಎಚ್.ಆರ್. ಜಡೋನಿ, ಬೆಂಗಳೂರು-19

BENGALURU CITY UNIVERSITY

CHOICE BASED CREDIT SYSTEM

(Semester Scheme with Multiple Entry and Exit Options for Under Graduate Course)

Syllabus for BCA Computer Science
(I & II Semester)

2021-22 onwards

BANGALORE CITY UNIVERISTY

Proceading of the meeting of the Board of Studies in Computer Science, held in the Board Room of Canara Bank School of Management Studies, Central College Campus, Bangalore City University, Bangalore on 04-10-2021 at 11.00 am

The Following Members were present:

1. Dr. Sussesha, Professor, PG Department of Computer Science, Mysore Univeristy
2. Dr. Chandrakanth Naikodi, Associate Professor, PG Department of Computer Science, Davanagere University
3. Dr. H.K. Gundurao, Associate Professor, Vijaya College, Bangalore
4. Dr. Prathibha V Kalburgi, Ramaiah College of Arts Science, and Commerce, Bangalore
5. Mrs. Amalorpavam, Sambram Academi of Management Studies, Bangalore
6. Dr. Muralidhara S L, Professor, Department of Computer Science, Bangalore University

The Following Member was present online

1. Dr. Guru D.S, Professor, PG Department of Computer Science, Mysore Univeristy

The Following member is diseased

1. Late. Malathi Pasani. A

The Following Members did not attend the meeting:

1. Dr Prabhakar C.J, Professor, Kuvempu University, Shimogga
2. Dr. Bhagyawana S Mudigowda, Associate Professor, Maharani Cluster University
3. Smt. Nagarathnamma S.M, Associate Professor, Maharani Cluster Univeristy

The Chairperson welcomed the members and briefed the members on the proposed syllabus. The Committee discussed the syllabus in detail and approved the following syllabus:

1. III and IV semester syllabus for the MCA CBCS Scheme
2. The syllabus for I to IV semesters syllabus for M.Sc (Computer Science) - CBCS Scheme
3. Syllabus Structure for the NEP BCA, and I, and II semester syllabus for the same
4. Syllabus Structure for the NEP B.Sc Computer Science, and I and II semester syllabus for the same
5. Electives for the CBCS BCA Syllabus

The Chairperson thanked all the members for their active participation.

(Dr. Sussesha) (Dr. Chandrakanth Naikodi) (Dr. H.K. Gundurao)

(Mrs. Prathibha V Kalburgi) (Mrs. Amalorpavam)

(Dr. Muralidhara B L) 04.10.2021

Chairperson

MEMBERS OF THE BoS IN COMPUTER SCIENCE

1	Dr. Muralidhara B L Professor Department of Computer Science Bangalore University	CHAIRPERSON
2	Dr. Guru D.S Professor PG Department of Computer Science Mysore Univer sty	Member
3	Dr. Susesha Professor, PG Department of Computer Scier ce Mysore Univeristy	Member
4	Dr. Prabhakar C J Professor Kuvempu University, Shimogga	Member
5	Dr. Chandrakanth Na kodi Associate Professor Department of Computer Science Davanagere University	Member
6	Dr. Prathibha V Kalburgi Ramaiah College of Arts Science, and Commerce Bangalcre	Member
7	Mrs. Amalorpavam Sambram Academi of Management Studies Bangalore	Member
8	Dr. H.K. Gundurao Associate Professor Vijaya College, Bangalore	Member
9	Dr. Bhagyawana S Mudigowda Associate Professor Maharani Cluster University, Bangalore	Member
10	Smt. Nagarathnamma S.M Associate Professor Maharani Cluster Univeristy, Bangalore	Member

BANGALORE CITY UNIVERSITY
BCA SYLLABUS (NEP)
[Based on I-C. Model of Karnataka State Higher Education Council]

Semester	Course Code	Title of the Paper	Credits	Languages, Skill Enhancement, SEC and Ability Enhancement Courses(AEC)	Credits	Total Credits
I	CA-C1T	Discrete Structure	3	OE1: Open Elective	3	26
	CA-C2T	Problem solving Techniques	3	Language L1	3	
	CA-C3T	Data Structure	3	Language L2	3	
	CA-C4L	Problem solving Lab	2	SEC I : Office Management Tools	2	
	CA-C5L	Data Structure Lab	2	Physical Education	1	
				Health & Willingness	1	
II	CA-C6T	Computer Architecture	3	OE2: Open Elective	3	26
	CA-C7T	Object Oriented Programming using Java	3	Language L1	3	
	CA-C8T	Database Management System	3	Language L2	3	
	CA-C9L	Java Lab	2	Environmental Science	2	
	CA-C10L	Database Management System Lab	2	Physical Education	1	
				NCC/NSS/CL/R&R	1	
III	CA-C11T	Operating Systems	3	OE3: Open Elective	3	26
	CA-C12T	Computer Networks	3	Language L1	3	
	CA-C13T	Python Programming	3	Language L2	3	
	CA-C14L	Computer Networks Lab	2	SEC II : Computer Assembly and Repair	2	
	CA-C15L	Python Programming Lab	2	Physical Education	1	
				NCC/NSS/CL/R&R	1	
IV	CA-C16T	Software Engineering	3	OE4: Open Elective	3	26
	CA-C17T	Artificial Intelligence	3	Language L1	3	
	CA-C18T	Internet Technologies	3	Language L2	3	
	CA-C19L	Artificial Intelligence Lab	2	The Constitution of India	2	
	CA-C20L	Internet Technologies Lab	2	Physical Education	1	
				NCC/NSS/CL/R&R	1	
V	CA-C21T	Design and Analysis of Algorithm	3	CA-V1 Vocation Course I : Quantitative Techniques	5	23
	CA-C22T	Data Analytics	3	CA-E1 Elective I : a. Data Mining b. Computer Graphics	3	
	CA-C23T	Web Programming	3	SEC III : Cyber Crime, Cyber Law, and Intellectual Property Right	2	
	CA-C24L	Data Analytics Lab	2	Physical Education		
	CA-C25L	Web Programming Lab	2	NCC/NSS/CL/R&R	1	

Semester	Course Code	Title of the Paper	Credits	[illegible] Ability Enhancement Course (AEC)	Credits	Total Credits
VI	CA-C25T	Theory of Computation	3	CA-V2 Vocation Course II : Electronic Content Design	3	23
	CA-C27T	Machine Learning	3	CA-E2 Elective II : a. Operations Research b. Software Testing	3	
	CA-C28T	Mobile Application Development	3	Professional Communication	2	
	CA-C29L	Machine Learning Lab	2	Physical Education	1	
	CA-C30L	Mobile Application Development Lab	2	NCC/NSS/CL/R&R	1	
VII	CA-C31T	Cloud Computing	3	CA-V3 Vocation Course III : Technical Writing	3	21
	CA-C32T	Internet of Things	3	CA-E3 Elective III : a. Modelling and Simulation b. Compiler Design	3	
	CA-C33T	Internship	2	Research Methodology	3	
	CA-C34L	Cloud Computing Lab	2			
	CA-C35L	Internet of Things Lab	2			
VIII	CA-C36T	Block Chain Technologies	3	CA-V4 Vocation Course IV : Project Management	3	20
	CA-C37T	Cryptography and System Security	3	CA-E4 Elective IV : a. Human Computer Interface b. Parallel Algorithms	3	
	CA-C38T	Block Chain Technologies Lab	2	Research Project	6	

CA-CIT: DISCRETE STRUCTURES

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT - I [12 Hours]

Set Theory and Logic: Fundamentals of Set theory. Set Operations and the Laws of Set Theory, Counting and Venn Diagrams, Cartesian Products and Relations. Functions–One-to-One, Onto Functions, Function Composition and Inverse Functions. Mathematical Induction, The well ordering principle, Recursive Definitions, Structural Induction, Recursive algorithms. Fundamentals of Logic, Propositional Logic, Logical Connectives and Truth Tables, Logic Equivalence, Predicates and Quantifiers.

UNIT - II [12 Hours]

Counting and Relations: Basics of counting. Pigeonhole Principle, Permutation and Combinations, Binomial coefficients. Recurrence relations, Modeling with recurrence relations with examples of Fibonacci numbers and the tower of Hanoi problem. Divide and Conquer relations with examples (no theorems). Definition and types of relations, Representing relations using matrices and digraphs

UNIT - III [12 Hours]

Matrices: Definition, order of a matrix, types of matrices, operations on matrices, determinant of a matrix, inverse of a matrix, rank of a matrix, linear transformations, applications of matrices to solve system of linear equations

UNIT - IV [12 Hours]

Graph Theory: Graphs. Introduction, Representing Graphs, Graph isomorphism, Operations on graphs. Trees: Introduction, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees, Prim's and Kruskul's Algorithms. Connectivity, Euler and Hamilton Paths, Planar Graphs. Directed graphs: Fundamentals of Digraphs, Computer Recognition - Zero-One Matrices and Directed Graphs, Out-degree, in-degree, connectivity, orientation, Eulerian and Hamilton directed graphs, tournaments

Text Books:

1. Ralph P. Grimaldi: Discrete and Combinatorial Mathematics, 5thEdition, Pearson Education, 2004.
2. C. L. Liu. Elements of Discrete Mathematics, Tata McGraw-Hill, 2000.
3. F. Harary: Graph Theory, Addition Wesley, 1969.
4. Richard Bronson, Schaum's Outline of Matrix Operations, McGraw-Hill publications, 2nd Edition, 2011

Reference Books:

1. Kenneth H Rosen. Discrete Mathematics and its Applications, McGraw-Hill publications, 7th edition, 2007.
2. J. P. Tremblay and R.P. Manohar. Discrete Mathematical Structures with applications to Computer Science, Mc Graw Hill Ed. Inc. 1975.
3. Charles G Cullen. Matrices and Linear Transformations, Dover Publications Inc., Second Edition, 1990

Web Resources:

1. https://www.my-mooc.com/en/categorie/mathematics
2. http://www.nptelvideos.in/2012/11/discrete-mathematical structures.html
3. https://ocw.mit.edu/courses/mathematics/

CA-C2T: PROBLEM SOLVING TECHNIQUES

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT - I [12 Hours]

Introduction: The Role of Algorithms in Computing, Algorithms as a technology. Analyzing algorithms, Designing algorithms, Growth of Functions, Asymptotic notation. Standard notations and common functions. Fundamental Algorithms: Exchanging the values of two variables, Counting, Summation of a set of numbers, Factorial Computation, Generating of the Fibonacci sequence. Reversing the digits of an integer, Character to number conversion.

UNIT - II [12 Hours]

C Programming: Getting Started, Variables and Arithmetic expressions. Input and Output: Standard input and output, formatted output- printf, variable length argument list, formatted input-scanf. Control Flow: Statements and Blocks, If-else, else-if, switch, loops: while loop, for loop, do while, break and continue, goto and labels. Pointers and Arrays: pointers and address, pointers and function arguments, multidimensional array, initialization of pointer arrays, command line arguments.

UNIT - III [12 Hours]

Factoring Methods: Finding the square root of a number, the smallest Divisor of an integer, the greatest common divisor of two integers, computing the prime factors of an integer, generation of pseudo random numbers, raising a number to a large power. Array Techniques: Array order Reversal, Array counting or Histogramming, Finding the maximum number in a set, removal of duplicates from an ordered array, partitioning an array, Finding the kth smallest element, multiplication of two matrices.

UNIT - IV [12 Hours]

Merging: the two-way merge. Sorting: Sorting by selection, sorting by exchange, sorting by insertion, sorting by diminishing increment, sorting by partitioning. Searching: binary search, hash search Text processing and Pattern searching: text line length adjustment, keyword searching in text, text line editing, linear pattern search

Text Books:

1. R.G Dromey, "How to Solve it by Computer", Pearson Education India, 2008
2. Thomas H Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", 3rd Edition, The MIT Press Cambridge, Massachusetts London, England, 2008
3. Brain M Kernighan, and Dennis M. Ritchie, "The C Programming Language", 2nd edition, Princeton Hall Software Series, 2012

Reference Books:

1. Steven S. Skiena, "The Algorithm Design Module", 2nd Edition, Springer-Verlag London Limited, 2008.
2. Donald E. Knuth, The Art of Computer Programming", Volume 1: Fundamental Algorithms, 3rd Edition, Addison Wesley Longman, 1997
3. Donald E. Knuth, The Art of Computer Programming", Volume 2: Seminumerical Algorithms, 3rd Edition. Addison Wesley Longman, 1998.
4. Greg Perry and Dean Miller, "C programming Absolute Beginner's Guide", 3rd edition, Pearson Education, Inc, 2014

Web Resources:

1. http://algorithmsforinterviews.com "Algorithms for Interviews"

CA-C3T: DATA STRUCTURES

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT-I [12 Hours]

Introduction and Overview Definition, Elementary data organization, Data Structures, data Structures operations, Abstract data types, algorithms complexity, time-space trade off. Preliminaries: Mathematical notations and functions, Algorithmic notations, control structures, Complexity of algorithms, asymptotic notations for complexity of algorithms. Arrays: Definition, Linear arrays, arrays as ADT, Representation of Linear Arrays in Memory,Traversing Linear arrays, Inserting and deleting, Multi-dimensional arrays, Matrices and Sparse matrices

UNIT-II [12 Hours]

Linked list: Definition, Representation of Singly Linked List in memory,Traversing a Singly linked list, Searching in a Singly linked list, Memory allocation, Garbage collection, Insertion into a singly linked list, Deletion from a singly linked list; Doubly linked list, Header linked list, Circular linked list. Stacks: Definition, Array representation of stacks, Linked representation of stacks, Stack as ADT, Arithmetic Expressions: Polish Notation, Conversion of infix expression to postfix expression, Evaluation of Post fix expression, Application of Stacks, Recursion, Towers of Hanoi, Implementation of recursive procedures by stack. Queues: Definition, Array representation of queue, Linked list representation of queues. Types of queue: Simple queue, Circular queue, Double-ended queue, Priority queue, Operations on Queues, Applications of queues.

UNIT-III [12 Hours]

Binary Trees: Definitions, Tree Search, Traversal of Binary Tree, Tree Sort, Building a Binary Search Tree, Height Balance: AVL Trees, Contiguous Representation of Binary Trees. Heaps, Lexicographic Search Trees: Tries, External Searching: B-Trees, Applications of Trees. Graphs Mathematical Back ground, Computer Representation, Graph Traversal, Topological Sorting

UNIT-IV [12 Hours]

Searching: Introduction and Notation, Sequential Search, Binary Search, Comparison of Methods. Sorting: Introduction and Notation, Insertion Sort, Selection Sort, Shell Sort, Divide And Conquer, Merge sort for Linked List, Quick sort for Contiguous List. Hashing: Sparse Tables, Choosing a Hash function, Collision Resolution with Open Addressing, Collision Resolution by Chaining.

Text Books.

1. Seymour Lipschutz, "Data Structures with C", Schaum's out Lines, Tata Mc Graw Hill, 2011.
2. Robert Kruse, C.L.Tondo, Bruce Leung,Shashi Mogalla,"Data Structures and Program Design using C", Pearson Education, 2009

ReferenceBooks:

1. Mark Allen Weiss," Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education, 2013.
2. Forouzan," A Structured Programming Approach using C",2nd Edition, Cengage LearningIndia,2008.

CA-C4P: Problem Solving Lab using C

Write, and execute C program for the following:

1. to read radius of a circle and to find area and circumference
2. to read three numbers and find the biggest of three
3. to check whether the number is prime or not
4. to read a number, find the sum of the digits, reverse the number and check it for palindrome
5. to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
6. to read percentage of marks and to display appropriate message (Demonstration of else-if ladder
7. to find the roots of quadratic equation
8. to read marks scored by n students and find the average of marks (Demonstration of single dimensional array)
9. to remove Duplicate Element in a single dimensional Array
10. to perform addition and subtraction of Matrices
11. to find factorial of a number
12. to generate fibonacci series
13. to remove Duplicate Element in a single dimensional Array
14. to find the length of a string without using built in function
15. to demonstrate string functions
16. to read, display and add two m x n matrices using functions
17. to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
18. to Swap Two Numbers using Pointers
19. to demonshate student structure to read & display records of n students
20. to demonstrate the difference between structure & union.

CA-C5P: DATA STRUCTURES LAB

NOTE: For all the programs write the output, flowchart and number of basic operations performed.

1. Given {4,7,3,2,1,7,9,0} find the location of 7 using Linear and Binary search and also display its first occurrence.
2. Given {5,3,1,6,0,2,4} order the numbers in ascending order using Bubble Sort Algorithm
3. Perform the Insertion and Selection Sort on the input {75,8,1,16,48,3,7,0} and display the output in descending order
4. Write a program to insert the elements {61,16,8,27} into singly linked list and delete 8,61,27 from the list. Display your list after each insertion and deletion.
5. Write a program to insert the elements {61,16,8,27} into linear queue and delete three elements from the list. Display your list after each insertion and deletion.
6. Write a program to insert the elements {61,16,8,27} into circular queue and delete 4 elements from the list. Display your list after each insertion and deletion.
7. Write a program to insert the elements {61,16,8,27} into ordered singly linked list and delete 8,61,27 from the list. Display your list after each insertion and deletion.
8. Write a program to add $6x^4+10x^3+4x+5$ and $4x^2+2x+1$ using linked list.
9. Write a program to push 5,9,34,17,32 into stack and pop 3 times from the stack, also display the popped numbers.
10. Write a recursive program to find GCD of 4,6,8.
11. Write a program to insert the elements {5,7,0,6,3,5} into circular queue and delete 6,9&5 from it(using linked list implementation)..
12. Write a program to convert an infix expression x^y/(5*z)+2 to its postfix expression
13. Write a program to evaluate a postfix expression: 5 3+8 2 - *.
14. Write a program to create a binary tree with the elements {18,15,40,50,30,17,41} after creation insert 45 and 19 into tree and delete 15,17 and 41 from tree. Display the tree on each insertion and deletion operation
15. Write a program to create binary search tree with the elements {2,5,1,3,9,0,6} and perform inorder, preorder and post order traversal.
16. Write a program to Sort the following elements using heap sort {9,16,32,8,4,1,5,8,0}
17. Given S1={"Flowers"} , S2={"are beautiful"} I. Find the length of S1 II. Concatenate S1 and S2 III. Extract the substring "low" from S1 IV. Find "are" in S2 and replace it with "is"

CA-C6T: COMPUTER ARCHITECTURE

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT - I [12 Hours]

Number Systems. Binary, Octal, Hexa decimal numbers, base conversion, addition, subtraction of binary numbers, one's and two's complements, positive and negative numbers, character codes ASCII, EBCDIC. Computer Arithmetic: Addition and Subtraction, Multiplication and Division algorithms, Floating-point Arithmetic Operations, Decimal arithmetic operations. Structure of Computers: Computer types, Functional units, Basic operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputer, Digital Logic Circuits: Logic gates, Boolean algebra, Map Simplification. Combinational Circuits: Half Adder, Full Adder, flip flops.Sequentialcircuits:Shiftregisters,Counters,IntegratedCircuits,Mux,Demux,Encoder,Decoder.Data representation: Fixed and Floating point.

UNIT - II [12 Hours]

Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer Instructions and Instruction cycle, Timing and Control, Memory-Reference Instructions, Input-Output and interrupt. Central processing unit: Stack organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Complex Instruction Set Computer (CISC) Reduced Instruction Set Computer (RISC). CISC vs RISC

UNIT - III [12 Hours]

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logic shift unit. Micro-programmed Control: Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit. Input Output: I/O interface, Programmed IO, Memory Mapped IO, Interrupt Driven IO, DMA. Instruction level parallelism: Instruction level parallelism (ILP)-overcoming data hazards. limitations of ILP

UNIT - IV [12 Hours]

Memory System: Memory Hierarchy, Semiconductor Memories, RAM(Random Access Memory), Read Only Memory (ROM), Types of ROM, Cache Memory, Performance considerations, Virtual memory, Paging, Secondary Storage, RAID. Multiprocessors And Thread level Parallelism. Characteristics of multiprocessors, Multi-Threaded Architecture, Distributed Memory MIMD Architectures, Interconnection structures,

TEXT BOOKS:

1. Mano M Morris, "Computer System Architecture", 3rd edition Pearson India(2019)
2. William Stallings, "Computer Organization and Architecture designing for performance", 10th edition, Pearson(2016)

REFERENCE BOOKS

1. Subrata Ghoshal, "Computer Architecture And Organization", Pearson India(2011).
2. Andrew S. Tanenbaum " Structured Computer Organization", 5th edition, Penrson Education Inc(2006).
3. Carl Hamacher, Zvonks Vranesic,SafeaZaky, "Computer Architecture And Organization". 5th edition McGraw Hill New Delhi,India(2002).
4. Kai Hwang, "Advanced Computer Architecture - Parallelism, Scalability, Programmability". Tata Megraw-Hill (2008).

CA67T: OBJECT ORIENTED PROGRAMMING USING JAVA

Total Teaching Hours: 48 No. of Hours / Week: 03

UNIT-I [12 Hours]

Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, Math class, Arrays in java. Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference

UNIT-II [12 Hours]

Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class. Interface in Java, Package in java, UTIL package.

UNIT-III [12 Hours]

Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics. Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing, Exceptional handling mechanism I/O programming: Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files.

UNIT-IV [12 Hours]

Multithreading in java: Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try-catch-finally, Collections in java, Introduction to JavaBeans and Network Programming.

Textbooks:

1. E. Balaguruswamy, Programming with JAVA, McGraw Hill, New Delhi, 2007

Reference Books:

1. Raj Kumar Buyya, Object Oriented Programming with JAVA, McGraw Hill, 2009
2. Herbert Schildt, Java A Beginner's Guide – Create, Compile, and Run Java Programs Today, Sixth Edition, Oracle Press, 2014
3. Ken Arnold, James Gosling, "The Java Programming Language, Fourth Edition, Addison Wisely, 2005
4. Herbert Schildt, 'The Complete Reference Java, 7th Edition, McGraw Hill, 2007

Web Resources

1. https://docs.oracle.com/javase/tutorial/
2. https://javabeg.nnerstutorial.com/core-java-tutorial/

CA-C8T: DATABASE MANAGEMENT SYSTEMS

Total Teaching Hours. 48 No. of Hours / Week: 03

UNIT - 1 [12 Hours]

Databases and Database Users: Introduction, An example, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using DBMS Approach, A Brief History of Database Applications, When Not to Use a DBMS. Database System Concepts and Architecture: Data Models, Schemas, and Instances, Three-schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client-Server Architectures, Classification of Database Management Systems.

UNIT - 2 [12 Hours]

Data Modeling Using Entity-Relationship Model: Using High-Level Conceptual Data Models for Database Design, An Example Database Application, Entity Types, Entity Sets, Attributes and Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, Refining the ER Design Company Database Diagrams, Naming Conventions and Design. Issues, File organization and storage, secondary storage devices, type of single level ordered index, multi-level indexes, Indexes on multiple keys, other types of indexes.

UNIT – 3 [12 Hours]

Relational Model and Relational Algebra: Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Update Operations, Transactions and Dealing with Constraint Violations, Unary Relational Operations: SELECT and PROJECT, Relational Algebra Operations from SET Theory, Binary Relational Operations: JOIN and DIVISION, Additional Relational Operations, Examples of Queries in Relational Algebra. Relational Database Design: Anomalies in a database, functional dependency, normal forms, lossless join and dependency, BCNF, normalization through synthesis, higher order normal forms SQL- SQL Data Definition and Data Types, Specifying Constraints in SQL, Schema Change Statements in SQL, Basic Queries in SQL, More Complex SQL Queries, Insert, Delete and Update Statements in SQL, Specifying Constraints as Assertion and Trigger, Views(Virtual Tables) in SQL, Embedded SQL, Dynamic SQL,

UNIT – 4 [12 Hours]

Introduction to transaction processing, transaction and system concepts, desirable properties of transactions, transaction support in SQL. Concurrency control techniques: two-phase locking techniques, concurrency control based on timestamp ordering. Recovery techniques: recovery concepts, recovery in multi-database systems, database backup and recovery from catastrophic failures.

Text Books:

1. Elmasri and Navathe. Fundamentals of Database Systems, 7th Edition, Addison-Wesley, 2016.
2. Silberschatz, Korth and Sudharshan Data base System Concepts, 7th Edition, Tata McGraw Hill, 2019.

References:

1. C.J. Date, A. Kannan, S. Swamynathan: An Introduction to Database Systems, 8th Edition, Pearson education, 2009
2. Database Management Systems :Raghu Ramakrishnan and Johannes Gehrke , 3rd Edition, McGraw-Hill, 2003

CA-C9P: JAVA PROGRAMMING LAB

1. Write a simple java application to print the message, "Welcome to java"
2. Write a program to display the month of a year. Months of the year should be held in an array.
3. Write a program to demonstrate a division by zero exception
4. Write a program to create a user defined exception say Pay Out of Bounds. .
5. Write a java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
6. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.
7. Write a program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.
8. Write a java program to create a student class with following attributes. Enrollment_id: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declaredas zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details In the main method create an array of three student objects and display the details.
9. In a college first year class are having the following attributesName of the class (BCA, BCom, BSc), Name of the staff No of the students in the class, Array of students in the class
10. Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class
11. Write a Java program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.
12. Create a package' student.Fulltime.BCA' in your current working directory
    a. Create a default class student in the above package with the following
    attributes: Name. age, sex. b. Have methods for storing as well as displaying
13. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
14. Write a program to handle Null Pointer Exception and use the "finally" method to display a message to the user.
15. Write a program which create and displays a message on the window
16. Write a program to draw several shapes in the created window
17. Write a program to create an applet and draw grid lines
18. Write a program which creates a frame with two buttons father and
    mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
19. Create a frame which displays your personal details with respect to a button click
20. Create a simple applet which reveals the personal information of yours.
21. Write a program to move different shapes according to the arrow key pressed.
22. Write a java Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
23. Demonstrate the various mouse handling events using suitable example.
24. Write a program to create menu bar and pull-down menus.

CA- C10P: DATABASE MANAGEMENT SYSTEMS LAB

PART – A

1 Draw E-R diagram and convert entities and relationships to relation table for a given scenario. Two assignments shall be carried out i.e. consider two different scenarios (eg. bank, college)

Consider the Company database with following Schema

EMPLOYEE (FNAME, MINIT, LNAME, SSN, BDATE,ADDRESS,SEX,SALARY, SUPERSSN, DNO)

DEPARTMENT (DNAME, DNUMBER,MGRSSN,MSRSTARTDATE)

DEPT_LOCATIONS (DNUMBER, DLOCATION)

PROJECT (PNAME, PNUMBER, PLOCATION, DNUM)

WORKS_ON (ESSN, PNO, HOURS)

DEPENDENT (ESSN, DEPENDENT_NAME, SEX, BDATE, RELATIONSHIP)

2. Perform the following:

a. Viewing all databases, Creating a Database, Viewing all Tables in a Database.

Creating Tables (With and Without Constraints), Inserting/Updating/Deleting

Records in a Table, Saving (Commit) and Undoing (rollback)

3. Perform the following:

a. Altering a Table, Dropping/Truncating/Renaming Tables, Backing up / Restoring a Database.

4 For a given set of relation schemes, create tables and perform the following Simple Queries, Simple Queries with Aggregate functions, Queries with Aggregate functions (group by and having clause).

5. Execute the following queries

a. How the resulting salaries if every employee working on the 'Research' Departments is given a 10% raise.

b Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department

6. Execute the following queries
   a. Retrieve the name of each employee Controlled by Department number 5 (use EXISTS operator).
   b Retrieve the name of each dept and number of employees working in each Department which has at least 2 employees

7 Execute the following queries
   a. For each project, retrieve the project number, the project name, and the number of employee who work on that project.(use GROUP BY)
   b. Retrieve the name of employees who born in the year 1990's

8. For each Department that has more than five employees, retrieve the department number and number of employees who are making salary more than 40000.

9. For each project on which more than two employees work, retrieve the project number, project name and the number of employees who work on that project.

10. For a given set of relation tables perform the following: Creating Views (with and without check option), Dropping views, Selecting from a view

PART B

Create the following tables with properly specifying Primary keys, Foreign keys and solve the following queries.

BRANCH (Branchid, Branchname, HOD)
STUDENT (USN, Name, Address, Branchid, sem)
BOOK (Bookid, Bookname, Authorid, Publisher, Branchid)
AUTHOR (Authorid, Authorname, Country, age)
BORROW (USN, Bookid, Borrowed_Date)

1. Perform the following:
   a. Viewing all databases, Creating a Database, Viewing all Tables in a Database, Creating Tables (With and Without Constraints), Inserting/Updating/Deleting Records in a Table, Saving (Commit) and Undoing (rollback)
   Execute the following Queries:

2. a. List the details of Students who are all studying in 2nd sem BCA.
   b. List the students who are not borrowed any books.

3. a. Display the USN, Student name, Branch_name, Book_name, Author_name, Books_Borrowed_ Date of 2nd sem BCA Students who borrowed books.
   b. Display the number of books written by each Author.

4. a. Display the student details who borrowed more than two books.
   b.Display the student details who borrowed books of more than one Author.

5. a. Display the Book names in descending order of their names.
   b. List the details of students who borrowed the books which are all published by the same publisher.

Consider the following schema:
STUDENT (USN, name, date_of_birth, branch, mark1, mark2, mark3, total, GPA)

6. Perform the following:
   a. Creating Tables (With and Without Constraints), Inserting/Updating/Deleting Records in a Table, Saving (Commit) and Undoing (rollback)

7. Execute the following queries:
   a. Find the GPA score of all the students.
   b. Find the students who born on a particular year of birth from the date_of_birth column.

8. a. List the students who are studying in a particular branch of study.
   b. Find the maximum GPA score of the student branch-wise.

ಅರು ನೀ ಅನಿಕೇತನ

BE BOUNDLESS

Bangalore City University
Department of Physics

Central College Campus
Bengaluru – 560 001

Syllabus for
I & II Semester Physics Papers
Under Graduate(UG) Program
Framed according to the National Education Policy (NEP 2020)

September 27, 2021

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

ಜ್ಞಾನ ಭಾರತಿ ಆವರಣ

BE BOUNDLESS

Board of Studies in Physics (UG) Members

Professor. B Eraiah	(Chairman)	Dept. Physics, Bangalore University, Bengaluru-56
Dr. S N Shobha Devi		BMS college for Women, Basavanagudi, Bengaluru-04
Sri G Ramesha,		PES College, Hanumantha nagar, Bengaluru-50
Dr. R.S. Muralidhara		PES College, Hanumantha nagar, Bengaluru-50
Dr. Vasu		Vivekananda Degree College, Bengaluru-5
Dr. A S Govind,		Vijaya College. R.V Road, Basavanagudi, Bengaluru -04
Dr. P Aswini		Vijaya College, R.V Road, Basavanagudi, Bengaluru -04
Dr. K C Radha,		Vijaya College, R.V. Road, Basavanagudi, Bengaluru -04
Dr. G Krishna Reddy		Maharani Science College for Women, Bengaluru-01
Dr. V S Rohini		Nrupathunga University, Nrupathunga Road, Bengaluru-01

Open Electives

Sl. No.	1 to 4 Semester Pool A
1.	Phy-OE1. Energy Sources
2.	Phy-OE2: Climate Science
3.	Phy-OE3: Astronomy
4.	Phy-OE4: Medical Physics
5	Phy-OE5: Optical Instruments
6.	Phy-OE6: Sports Science
7.	Phy-OE7 Nanotechnology
8.	Phy-OE8: Electrical Instruments
9.	Phy-OE9: Physics for All.[#&%]

[#]Students who have chosen Phy-DST1 paper are not eligible to take Phy-OE9. paper

Discipline Specific Electives for 7 to 10 Semesters

7th Sem Electives		8th Sem Electives	
A.	Condensed Matter Physics-1	A.	Atomic & Molecular Physics-1
B.	Nuclear and Particle Physics	B.	Materials Physics & Nano materials
C	Theoretical and Computational Physics-1	C.	Lasers and non-linear optics
D.	Biophysics	D.	Plasma Physics
E.	Astronomy and Astrophysics	E.	Physics of Semiconductor devices

9th Sem Electives (Specialization papers) Pool B-III		10th Sem Electives (Specialization papers) Pool B-IV	
A.	Condensed Matter Physics-2	A.	Condensed Matter Physics-3
B	Nuclear and Particle Physics-2	B.	Nuclear and Particle Physics-3
C.	Atomic & Molecular spectroscopy-1	C.	Atomic & Molecular spectroscopy-2
D.	Materials Physics & Nanophysics -1	D.	Materials Physics & Nanophysics -2
E.	Theoretical and Computational Physics-1	E	Theoretical and Computational Physics-2
F.	Astronomy and Astrophysics-1	F.	Astronomy and Astrophysics-2

Course Structure
(Major Discipline: Physics)
Semester 1 - 10

SEMESTER	Discipline Core Theory (DSCT)	Core Papers
SEMESTER -1	Phy.DSCT1	Mechanics & Properties of Matter (Select one Open Elective from the Pool A)
SEMESTER -2	Phy.DSCT2	Electricity and Magnetism (Select one Open Elective from the Pool A)
SEMESTER -3	Phy.DSCT3	Wave motion and optics (Select one Open Elective from the Pool A)
SEMESTER -4	Phy.DSCT4	Thermal Physics & Electronics (Select one Open Elective from the Pool A)
SEMESTER -5	Phy.DSCT5 Phy.DSCT6	1. Classical Mechanics and Quantum Mechanics- I 2. Elements of Atomic, Molecular Physics
SEMESTER -6	Phy.DSCT7 Phy.DSCT8	1. Elements of Nuclear Physics and Nuclear Instruments 2. Elements of Condensed Matter Physics
SEMESTER -7	Phy.DSCT9 Phy DSCT10 Phy.DSCT11	1. Mathematical Methods of Physics – I 2. Classical Electrodynamics. 3. Experimental methods of Physics 4. Research Methodology
SEMESTER -8	Phy DSCT12 Phy DSCT13 Phy.DSCT.4	1. Classical Mechanics and Quantum Mechanics-II 2. Statistical Mechanics 3. Astrophysics & Astronomy 4. Research Project* (Select Two DSE subjects from the Pool B-II shown below) *In lieu of the research Project, two additional elective papers/ Internship may be offered.
SEMESTER -9	Phy.DSCT.5	1. Mathematical Methods of Physics – II (Select One DSE subjects from the Pool B-III shown below) 2. Research Project
SEMESTER -10	Phy.DSCT17	1. Quantum Mechanics – III (Select One DSE subjects from the Pool B-IV shown below) 2. Research Project

Curriculum Framework for Multidisciplinary Four- year Undergraduate Programme/ Five-year Integrated Master's Degree Programme

Year	Objectives	Nature of Courses	Outcome	No. of courses
1st year – (1st & 2nd Semesters)	Understanding and Exploration	1. Major Core Courses 2. Minor/Related Discipline 3. Languages, 4. Ability Enhancement Compulsory Courses 5. Skill Enhancement/ Development Courses	Understanding of Disciplines Language Competency Gaining perspective of context/Generic skills Basic skills sets to pursue any vocation	1+1 1+1 2+2 1+1 1+1
Exit option with Certification				
2nd Year - (3rd & 4th Semesters)	Focus and Immersion	1. Major Core Courses 2. Minor/ Related Discipline 3. Ability Enhancement 4. Skill based Vocational 5. Extra Curricular Activities	Understanding of disciplines Gaining perspective of context Skill sets to pursue vocation Development of various Domains of mind &Personality	2+2 1+1 1+1 1+1 1+1
Exit Option with Diploma				
3rd Year - (5th & 6th Semesters)	Real time Learning	1. Major Discipline Core and Elective Courses 2. Minor Discipline/ Generic or Vocational Electives/Field based Learning/ Research Project	In depth learning of major and minor disciplines, Skill sets for employability. Exposure to discipline beyond the chosen Subject Experiential learning/ Research.	2+2 1+1 1+1
Exit option with Bachelor Degree				
4th Year - (7th &8th Semesters)	Deeper Concentration	Major Discipline Core and Elective courses Research/ Project Work with Dissertation	Deeper and Advanced Learning of Major Discipline Foundation to pursue Doctoral Studies & Developing Research competencies	4+4
Bachelor Degree with Honours				
5th Year - (9th & 10th Semesters)	Master of the subject	Major Discipline Core and Elective courses/ Research/ Project Work with Dissertation	Deeper and Advanced Learning of the Major Discipline towards gaining proficiency over the subject	4+4/6+6
Master's Degree				

Aims of UG program in Physics

The aims and objectives of our UG educational programs in sciences in general and Physics in particular should be structured to

- Create the facilities and environment in all the educational institutions to consolidate the knowledge acquired at +2 level and to motivate and inspire the students to create deep interest in Physics, to develop broad and balanced knowledge and understanding of physical concepts, principles and theories of Physics.
- Learn, design and perform experiments in the labs to demonstrate the concepts, principles and theories learned in the classrooms.
- Develop the ability to apply the knowledge acquired in the classroom and laboratories to specific problems in theoretical and experimental Physics.
- Expose the student to the vast scope of Physics as a theoretical and experimental science with applications in solving most of the problems in nature spanning from 10^{-15} m to 10^{26}m in space and 10^{-10} eV to 10^{25}eV in energy dimensions.
- Emphasize the discipline of Physics to be the most important branch of science for pursuing the interdisciplinary and multidisciplinary higher education and/or research in interdisciplinary and multidisciplinary areas.
- To emphasize the importance of Physics as the most important discipline for sustaining the existing industries and establishing new ones to create job opportunities at all levels of employment.

The progressive curriculum shall position knowledge and skills required on the transformation of novice problem solvers (at entry level of the program) to expert problem solvers (by the time of graduation) as given below:

- At the end of first year – Ability to solve well defined problems
- At the end of second year – Ability to solve broadly defined problems
- At the end of third year – Ability to solve complex problems that are ill-structure that require multi-disciplinary skills to solve them
- During fourth year – Experience of workplace problem solving in the form of internship or Research Experience preparing for higher education or Entrepreneurship and employment.

- One Major Discipline and One Education Discipline along with Languages, Generic Electives, Ability Enhancement and Skill Development Courses including Extracurricular Activities.

Progressive Certificate, Diploma, Bachelor Degree or Bachelor Degree with Honours Provided at the End of Each Year of Exit of the Four-year Undergraduate Programme/ Five-year Integrated Master's Degree Programme

EXIT OPTIONS	Credits required
Certificate upon the Successful Completion of the **First** Year (Two Semesters) of the multidisciplinary Four-year Undergraduate Programme/Five-year Integrated Master's Degree Programme	44 - 48
Diploma upon the Successful Completion of the Second Year (Four Semesters) of the multidisciplinary Four-year Undergraduate Programme/Five-year Integrated Master's Degree Programme	88 - 96
Basic Bachelor Degree at the Successful Completion of the Third Year (Six Semesters) of the multidisciplinary Four- year Undergraduate Programme/Five year Integrated Master's Degree Programme	132 - 144
Bachelor Degree with Honours in a Discipline at the Successful Completion of the Fourth Years (Eight Semesters) of the multidisciplinary Four-year Undergraduate Programme/Five-year Integrated Master's Degree Programme	176 - 192
Master's Degree in a Discipline at the Successful Completion of the Fifth Year (Ten Semesters) of the Five- year Integrated Master's Degree Programme	224- 240

Introduction

The NEP-2020 offers an opportunity to effect a paradigm shift from a teacher-centric to a student-centric higher education system in India. It is based on Outcome Based Education, where the Graduate Attributes are first kept in mind to reverse-design the Programs, Courses and Supplementary activities to attain the graduate attributes and learning outcomes. The learning outcomes-based curriculum framework for a degree in B.Sc. (Honours) Physics is intended to provide a comprehensive foundation to the subject and to help students develop the ability to successfully continue with further studies and research in the subject while they are equipped with required skills at various stages. The framework is designed to equip students with valuable cognitive abilities and skills so that they are successful in meeting diverse needs of professional careers in a developing and knowledge-based society. The curriculum framework takes into account the need to maintain globally competitive standards of achievement in terms of the knowledge and skills in Physics, as well develop scientific orientation, spirit of enquiry problem solving skills and human and professional will values which foster rational and critical thinking in the students.

Graduate attributes in Physics

Some of the characteristic attributes a graduate in Physics should possess are:

- Disciplinary knowledge and skills:
- Skilled communication:
- Critical thinking and problem solving capacity:
- Sense of inquiry:
- Team player/worker:
- Project Management Skills:
- Digital and ICT efficiency
- Ethical awareness / reasoning:
- National and international perspective:
- Lifelong learning

Flexibility

- The programmes are flexible enough to allow liberty to students in designing them according to their requirements. Students may choose a single Major, one Major with a Minor, and one Major with two Minors. Teacher Education or Vocational courses may be chosen in place of Minor/s. Below listed are the various options students may choose from.
- One Major subject/discipline, Two Languages, Generic Electives, Ability Enhancement, Skill Development and Vocational courses including Extracurricular Activities.
- One Major and one Minor subject/discipline along with Languages, Generic Electives, Ability Enhancement, Skill Development and Vocational courses including Extracurricular Activities
- Two Major subject/disciplines along with Languages, Generic Electives, Ability Enhancement, Skill Development and Vocational courses including Extracurricular Activities (subject to fulfilling the requirements as stated in 3.i and 3.ii)
- One Major subject/discipline and one Vocational course along with Languages, Generic Electives, Ability Enhancement and Skill Development and courses including Extracurricular Activities.

Members of the BOS (UG) Physics

Sl. No	Names	Members	Signature
01	Dr. B. Eraiah, Professor PG Department of Physics, Bangalore University, Bengaluru-560056.	Chairman	
02	Dr. S.N.Shobhadevi. Associate Professor Department of Physics, BMS college for Women, Basavanagudi, Bengaluru-560004.	Member	
03	Dr. G.Ramesha, Associate Professor Department of Physics, PES College50 Feet Road, Mysore bank colony, Hanumanthanagar, Bengaluru-560050	Member	
04	Dr. R S. Mumtidhara, Associate Professor, Department of Physics, PES College50 Feet Road, Mysore bank colony, Hanumanthanagar, Bengaluru-560050	Member	
05	Dr. Vasu, Associate Professor Department of Physics, Vivekananda degree College, Dr. Rajkumar Road, Rajajinagar II stage, Bangalore-55	Member	
06	Dr. A.S. Govind, Associate Professor, Department of Physics, Vijaya College, R.V. Road, Basavanagudi, Bangalore-560 004	Member	
07	Dr. P. Ashwini Associate Professor, Department of Physics, Vijaya College, R.V. Road, Basavanagudi,Bangalore-560 004	Member	
08	Dr. K.C. Radha, Associate Professor, Department of Physics, Vijaya College, R.V. Road, Basavanagudi,Bangalore-560 004.	Member	
09	Dr. G. Krishna Reddy Associate Professor, Department of Physics, Maharani Science College For Women, Cluster University, Bengaluru-560001.	Member	
10	Dr. V S Rohini Associate Professor, Department of Physics, Nrupathunga University (Govt. Science College) Nrupathunga Road, Bengaluru-560 001 .	Member	

Dr. B. ERAIAH
M.Sc.,M.Phil.,Ph.D.,
Professor, Department of Physics
Bangalore University, Bangalore-560056

Detailed Syllabus for Semester I & II

Semester – I

Phy-DSCT1: Mechanics and Properties of Matter	Course Credits (L:T+P) : 4:0:2=6
Total Contact Hours: 52	Duration of ESA: 3 hours

Course Outcomes (COs):

1. Fixing units, tabulation of observations, analysis of data (graphical/analytical).
2. Accuracy of measurement and sources of errors, importance of significant figures.
3. Knowledge of how g can be determined experimentally and derive satisfaction.
4. Understanding the difference between simple and torsional pendulum and their use in the determination of various physical parameters.
5. Knowledge of how various elastic moduli can be determined.
6. Measuring surface tension and viscosity and appreciate the methods adopted.
7. Hands on experience of different equipments.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	1	2	3	4	5	6
Fixing units, tabulation of observations, analysis of data (graphical/analytical)	x					
Accuracy of measurement and sources of errors, importance of significant figures		x				
Knowledge of how g can be determined experimentally and derive satisfaction.	x					
Understanding the difference between simple and torsional pendulum and their use in the determination of various physical parameters					x	
Knowledge of how various elastic moduli can be determined	x					
Measuring surface tension and viscosity and appreciate the methods adopted	x					
Hands on experience of different equipments.	x					

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'x' in the intersection cell if a course outcome addresses a particular program outcome.

Course Content Phy.DSCT1: Mechanics & Properties of Matter		Hrs
Unit – 1 (13 hours of teaching includes 3 hours of activities)		
Chapter No. 1	**Units and measurements:** System of units (CGS and SI), measurement of length, mass and time, dimensions of physical quantities, dimensional formulae, errors, Mean deviation.	4
Chapter No. 2	**Momentum and Energy:** Work and energy, Conservation of linear momentum, Conservation of energy with examples, Motion of rockets.	4
Chapter No. 3	**Special Theory of Relativity:** Constancy of speed of light, Postulates of the Special Theory of Relativity. Length contraction and Time dilation. Relativistic addition of velocities.	5
Topics for Self-study	Variable mass problem & Rocket motion Twin paradox	
	Suggested Activities	
Activity No. 1	i). Measure diameters of small balls of different size and estimate their volumes. ii). Measure lengths of nails of different size. iii) Measure volume of a liquid. iv). Measure distances and put the result both in CGS and SI units in 2, 3 and 4 significant figures. Mention the precession of the measurement. v). Estimate standard deviations wherever possible.	
Activity No. 2	Understand conservation of energy in every day examples like i) What happens in solar energy conversion panels ii) Pushing an object on the table it moves iii) Moving car hits a parked car causes parked car to move. In these cases, it is known that energy is conserved. How? Understand and verify if possible	
Unit – 2 (13 hours of teaching includes 3 hours of activities)		
Chapter No. 4.	**Laws of Motion:** Newton's Laws of motion, Dynamics of single particle and a system of particles, Centre of mass.	3

Chapter No. 5.	**Dynamics of Rigid bodies:** Rotational motion about an axis, Relation between torque and angular momentum, Rotational energy, Moment of inertia (MI). Laws of MI, MI of a rectangular lamina and solid cylinder, Flywheel.	6
Chapter No. 6.	**Gravitation:** Law of Gravitation, Motion of a particle in a central force field (motion in a plane, conservation of angular momentum, constancy of areal velocity is constant). Kepler's laws (statements). Satellite in a circular orbit.	4
Topics for self study(If any)	Geosynchronous orbits Basic idea of global positioning system (GPS).	
	Suggested Activities	
Activity No. 3	Moment of inertia is an abstract concept. It simply gives a measure of rotational inertia of a rigid body and it is proportional to the product of the square of radius, r of the body and its mass, m Refer to different websites to construct and perform simple experiments to verify MI of different objects.	
	Reference : www.khanacademy.org, www.pinterest.com, www.gcrc.carleton.edu	
Activity No. 4	Prepare suitable charts and give seminar talks in the class.	
	Reference : Weblink/Youtube/Book.	
Unit – 3 **(13 hours of teaching includes 3 hours of activities)**		
Chapter No. 7	**Elasticity:** Hooke's law, Stress-strain diagram, elastic moduli, relation between elastic constants, Poisson's ratio, expression for Poisson's ratio in terms of elastic constants. Work done in stretching and work done in twisting a wire, twisting couple on a cylinder. Beams, bending of beams, expression for bending moment, theory of single cantilever. Torsional pendulum, expression for time-period of torsional oscillations, determination of rigidity modulus (static and dynamic methods) and moment of inertia, determination of η, μ and σ by Searle's double bar with necessary theory.	13
Topics for self study	Time period of oscillations of a spring-mass system with non-negligible mass of the spring	

	Suggested Activities	
Activity No. 5	Arrange a steel spring with its top fixed with a rigid support on a wall and a meter scale along side. Add 100 g load at a time on the bottom of the hanger in steps. This means that while putting each 100g oad, we are increasing the stretching force by 1N. Measure the extension for loads up to 500g. Plot a graph of extension versus load. Shape of the grapa should be a straight line indicating that the ratio of load to extension is constant. Go for higher loads and find out elastic limit of the material	
	Reference : Weblink/Youtube/Book	
Activity No.6	Repeat the above experiment with rubber and other materials and find out what happens after exceeding elastic limit. Plot and interpret.	
	Reference : Weblink/Youtube/Book	
Unit – 4 **(13 hours of teaching Includes 3 hours of activities)**		
Chapter No. 8	**Surface tension:** Definition of surface , angle of contact, surface energy, relation between surface tension and surface energy, pressure difference across a curved surface (with example), excess pressure inside a spherical liquid drop	7
	Text Book : Units/sections to be Referred:	
Chapter No. 9	Topics to be covered: **Viscosity:** Streamline flow, turbulent flow, equation of continuity, determination of coefficient of viscosity by Poisulle's method, Stoke's method.	6
	Text Book . Units/sections to be Referred:	
Topics for self study(If any)	Capillarity detennination of surface tension by drop weight method.	
	Suggested Activities	
Activity No.7	Measure surface tension of water and other common liquids and compare and learn i) Why water has high ST? think of reasons. ii) Check whether ST is a function of temperature? You can do it by heating the water to different temperatures and measure ST. iii) Plot ST versus T and learn how it behaves.	

	Mix some quantity of kerosene or any oil to water and measure ST. Check whether ST for the mixture is more or less than pure water. Think of reasons.	
	Reference . Weblink/Youtube/Book	
Activity No. 8	Collect a set of different liquids and measure their viscosity. i) Find out whether sticky or non sticky liquids are most viscous. Think of reasons. ii) Mix non sticky liquid to the sticky liquid in defined quantities and measure viscosity. Find out viscosity is increasing or decreasing with increase of non-sticky liquid concentration. iii) Do the above experiment by mixing sticky liquid to the non sticky liquid. Find out change in viscosity with increase of concentration of sticky liquid. Think why anyone should know viscosity of a liquid.	
	Reference : Weblink/Youtube/Book	

Text Books

Sl No	Title of the Book	Author(s)	Publisher	Year of Publication
1	Mechanics	D. S. Mathur	S.Chand &Co.	2000
2	Mechanics and Relativity (3rd Edition)	Vishwa Singh Soni,	PHI Learning Pvt. Ltd.	2013
3	Mechanics (In SI Units): Berkeley Physics Course Vo. 1	Charles Kittel, Walter Knight, et al	Tata McGraw Hill	2007
4	Properties of Matter	Brij Lal & Subrahmanyam	S.Chand &Co.	2002

References Books

Sl No	Title of the Book	Author(s)	Publisher	Year of Publication
1	Principles of Physics	David Halliday, Jearl Walker & Robert Resnick	Wiley India Pvt. Ltd	2010
2	Physics (8th Edition)	David Halliday & Robert Resnick	Wiley India Pvt Ltd	2008

Paper Code: Phy-DSCP1 - Lab I

List of Experiments to be performed in Lab I

1.	Determination of g using bar pendulum (L versus T and L versus LT^2 graphs)
2.	Determination of moment of inertia of a Fly Wheel.
3.	Determination of rigidity modulus using torsional pendulum
4	Verification of parallel and perpendicular axis theorems.
5.	Determine the Young's Modulus of a bar by uniform bending method
6.	Determination of elastic constants of a wire by Searle's double bar method
7.	Young's modulus by Koenig's method
8.	Modulus of rigidity of a rod –Static torsion method.
9.	Viscosity by Stoke's method
10	Verification of Hooke's law.
11.	Determination of surface tension of a liquid and the interfacial tension between two liquids using drop weight method.
12	Critical pressure for stream line flow
13	Determine the Young's Modulus a bar by single cantilever method.
14	Study of motion of a spring and to calculate spring constant, g and mass of the spring.

Note: A minimum of EIGHT experiments to be carried out

Reference Books for Laboratory Experiments

Sl No	Title of the Book	Authors Name	Publisher	Year of Publication
1	Physics through experiments	B. Saraf	Vikas Publications	2013
2	A laboratory manual of Physics for undergraduate classes, 1st Edition,	D P Khandelwal	Vikas Publications.	1985
3	B.Sc. Practical Physics (Revised Edition)	C. L Arora	S.Chand & Co.	2007
4	An advanced course in practical physics.	D. Chattopadhyay, PC Rakshit, B. Saha	New Central Book Agency Pvt Ltd.	2002

Course Content: Semester – II

Phy-DSCT2: Electricity and Magnetism	Course Credits (L+T+P) : 4+0+2=6
Total Contact Hours: 52	Duration of ESA: 3 hours

Course Outcomes (COs):

1. Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
2. Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.
3. Apply Gauss's law of electrostatics to solve a variety of problems.
4. Describe the magnetic field produced by magnetic dipoles and electric currents.
5. Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.
6. Describe how magnetism is produced and list examples where its effects are observed.
7. Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.
8. Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity,• Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes (COs) / Program Outcomes (POs)	1	2	3	4	5	6
Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point, line, surface, and volume distributions of charges.	x	x				
Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics.	x					
Apply Gauss's law of electrostatics to solve a variety of problems.	x	x			x	
Describe the magnetic field produced by magnetic dipoles and electric currents.	x					
Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.	x					
Describe how magnetism is produced and list examples where its effects are observed	x				x	x
Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor.	x	x			x	x
Apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity,• Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.	x	x			x	x

Course Articulation Matrix relates course outcomes of course with the corresponding program outcomes whose attainment is attempted in this course. Mark 'X' in the intersection cell if a course outcome addresses a particular program outcome

Course Content Phy-DSCT2:Electricity and Magnetism		Hrs
Unit – 1 (13 hours of teaching includes 3 hours of activities)		
Chapter No. 1	**Electric charge and field:** Coulomb's law, electric field strength, electric field lines, point charge in an electric field and electric dipole, work done by a charge (derivation of the expression for potential energy)	3
Chapter No. 2	**Gauss law:** Gauss's law and its applications - electric fields of a (i) spherical charge distribution, (ii) line charge and (iii) an infinite flat sheet of charge.	3
Chapter No. 3	**Electrostatic potential** Electric potential, line integral, gradient of a scalar function, relation between field and potential, Potential due to point charge and distribution of charges (Examples: potential associated with a spherical charge distribution, infinite line charge distribution, infinite plane sheet of charges). Constant potential surfaces, Potential due to a dipole and electric quadrupole	7
Topics for self study	Concept of Voltage and Current Sources, Kirchhoff's Laws Power transform theorem.	
	Suggested Activities	
Activity No. 1	(i) Learn the difference between and DC and AC electricity and their characteristics. (ii) Voltage and line frequency standards in different countries. (iii) A small project report on production of electricity as a source of energy: Different methods	
	Reference ; Weblink/Youtube/Book	
Activity No. 2	(i) Learn to use a multimeter (analog and digital) to measure voltage, current and resistance. Continuity testing of a wire (ii) Learn about household electrical connection terminals:	

	Live, neutral and ground and voltage between the terminals. Role of earthing and safety measures	
	Reference : Weblink/Youtube/Book	
Unit – 2 **(13 hours of teaching includes 3 hours of activities)**		
Chapter No. 4.	**Conductors in electrostatic field:** Conductors and insulators, conductors in electric field. Capacitance and capacitors, expression for capacitance in a parallel plate capacitor, parallel plate capacitor with dielectric, Dielectrics: an atomic view. Energy stored in a capacitor, Dielectric and Gauss's law.	6
Chapter No. 5.	**DC currents:** Electric currents and current density. Electrical conductivity and Ohm's law (Review), Network theorems (Thevenin's theorem, Superposition theorem and the maximum power transfer theorem), Transient currents in RC, LR and LCR circuits.	7
Topics for self study(If any)	AC Currents and voltages in pure R, L and C circuits	
	Suggested Activities	
Activity No. 3	(i) Learn about electrical appliances which work with AC and DC electricity. (ii) Learn about types of resistors and their colour codes and types of capacitors (electrolytic and non-electrolytic)	
	Reference : Weblink/Youtube/Book	
Activity No. 4	(i) Learn about power transmission 3-phase electricity, voltage and phase (ii) Visit a nearby electrical power station. Interact with line men, Electrical engineers and managers. Discuss about power loss in transmission. How to reduce it? (iii) Prepare a small project report on street lighting and types of electrical bulbs.	
	Reference . Weblink/Youtube/Book	

Unit – 3 **(13 hours of teaching includes 3 hours of activities)**		
Chapter No.6	**Magnetism:** Definition of magnetic field, Ampere's law and Biot-Savart law (magnetic force and magnetic flux), Magnetic force on a current carrying conductor, Lorentz force, Hall effect in a conductor. Electromagnetic induction, Faraday's laws of induction, Lenz's Law, expression for self-inductance and energy stored in a magnetic field Mutual inductance, conducting rod moving in a magnetic field,	7
Chapter No. 7	**AC circuits:** RMS and average value of AC, Response of series RL, RC, LCR circuits using j-operator method, Quality factor, admittance and impedance, power and energy in AC circuits.	6
Topics for self study (If any)	Response of parallel RL, RC, LCR circuits using j-operator method	
	Suggested Activities	
Activity No. 5	(i) Prepare a small project report on street lighting and types of electrical bulbs. (ii) Learn the measurement of electric current using tangent galvanometer.	
	Reference : Weblink/Youtube/Book	
Activity No.6	Build a small coil with insulated copper wire. Connect an ammeter micro/milli ammeter. Verify magnetic induction using a powerful bar magnet.	
	Reference - Weblink/Youtube/Book	
Unit – 4		
Chapter No. 8	**Electromagnetic waves:** Equation of continuity, Maxwell's equations, displacement current, equation for propagation of electromagnetic wave, transverse nature of electromagnetic wave, energy transported by electromagnetic waves. Poynting vector, magnetic moment of a point charge moving in a circular loop, electric current in	8

	atoms, electron spin and magnetic moment.	
Chapter No. 9	**Magnetic materials:** Magnetic intensity and magnetic induction, Intensity of magnetization, Susceptibility, Permeability, Types of magnetic materials. diamagnetic, paramagnetic and ferromagnetic materials. Classical Langevin's theory of diamagnetism, B-H hysteresis curves, Hard and soft magnetic materials.	5
Topics for self study(If any)	1. Super conductivity 2. At least two Applications of magnetic materials	
	Suggested Activities	
Activity No.7	(i) Prepare a small project report on production of magnetic field- Permanent magnets, electromagnets and superconducting magnets. (ii) Learn the principle of working of a Gauss meter to measure magnetic field	
	Reference : Weblink/Youtube/Book	
Activity No. 8	(i) Model the earth's magnetic field with a diagram. (ii) Explain the effect of tilt of the earth's axis and reasons for the change in the tilt of the earth's axis over thousands of years.	
	Reference : Weblink/Youtube/Book	

Text Books

Sl No	Title of the Book	Author(s)	Publisher	Year of Publication
1	Physics-Part-II,	David Halliday and Robert Resnick	Wiley Eastern Limited	2001
2	Berkeley Physics Course, Vol.-2, Electricity and Magnetism. Special Edition	Edward M Purcell	Tata Mc Graw-Hill Publishing Company Ltd, New Delhi	2008

Paper Code: Phy-DSCP1-Lab II

List of Experiments to be performed in Lab II

1.	Verification of Superposition theorem.
2.	Verification of Maximum power transfer theorem
3.	Verification of Thevenin's theorem
4.	Determination of L and C by equal voltage method
5.	Determination of high resistance by leakage method using BG
6.	Determination of mutual inductance using a Ballistic galvanometer.
7.	Charging and discharging of a capacitor (energy dissipated during charging and time constant measurement).
8.	Frequency response of LCR Series resonance circuit
9.	Frequency response of LCR Parallel resonance circuit.
10	Impedance of series RC circuits - determination of frequency of AC
11	Identification and measurement of L, C and R elements in a black box
12.	Determination of self-inductance of a coil using Anderson's bridge
13.	Verification of laws of combination of capacitances using de-Sauty's bridge
14.	Determination of inductance using Maxwell's impedance bridge
15.	Determination of B_H using Helmholtz double coil galvanometer.

Note: A minimum of EIGHT experiments to be performed.

Open Elective Papers
Phy-OE1: Energy Sources (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I: Non-Renewable energy sources	Hrs.
Introduction: Energy concept-sources in general, its significance & necessity, Classification of energy sources: Primary and Secondary energy, Commercial and Non-commercial energy, Renewable and Non-renewable energy, Conventional and Non-conventional energy, Based on Origin-Examples and limitations. Importance of Non-commercial energy resources (4 hours) **Conventional energy sources:** Fossil fuels & Nuclear energy- production & extraction, usage rate and limitations Impact on environment and their issues & challenges. Overview of Indian & world energy scenario with latest statistics- consumption & necessity. Need of eco-friendly & green energy & their related technology. (8 hours)	13
Unit-II: Renewable energy sources	
Introduction: Need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity. (05 hours) **Solar energy:** Solar Energy-Key features, its importance, Merits & demerits of solar energy, Applications of solar energy Solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell -brief discussion of each Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems. (8 hours)	13
Unit-III	
Wind and Tidal Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces and grid interconnection topologies, Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices, Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy. (8 hours) **Geothermal and hydro energy:** Geothermal Resources, Geothermal Technologies (2 hours), Hydropower resources, hydropower technologies, environmental impact of hydro power sources (3 hours), Carbon captured technologies, cell, batteries, power consumption (1 hour)	13

Activity for tutorial classes 01 hour/week

1. Demonstration of on Solar energy, wind energy, etc, using training modules at Labs.
2. Conversion of vibration to voltage using piezoelectric materials.
3. Conversion of thermal energy into voltage using thermoelectric (using thermocouples or heat sensors) modules.
4. Project report on Solar energy scenario in India
5. Project report on Hydro energy scenario in India
6. Project report on wind energy scenario in India
7. Field trip to nearby Hydroelectric stations.
8. Field trip to wind energy stations like Chitradurga, Hospet, Gadag, etc.
9. Field trip to solar energy parks like Yerumaras near Raichur.
10. Videos on solar energy, hydro energy and wind energy

Reference Books

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Subhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assessment Handbook, 2009
6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
7. http://en.wikipedia.org/wiki/Renewable_energy

Phy-OE2: Climate Science (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Atmosphere: Atmospheric Science (Meteorology) as a multidisciplinary science. Physical and dynamic meteorology. Some terminology. difference between weather and climate, weather and climate variables, composition of the present atmosphere: fixed and variable gases, volume mixing ratio (VMR), sources and sinks of gases in the atmosphere. Green house gases. Structure (layers) of the atmosphere. Temperature variation in the atmospaere, temperature lapse rate, mass, pressure and density variation in the atmosphere. Distribution of winds.	13
Unit-II	
Climate Science: Overview of meteorological observations. measurement of : temperature, humidity, wind speed and direction and pressure. Surface weather stations, upper air observational network, satellite observation. Overview of clouds and precipitation, aerosol size and concentration, nucleation, droplet growth and condensation (qualitative description). Cloud seeding, lightning and discharge. Formation of trade winds. cyclones. **Modelling** of the atmosphere: General principles, Overview of General Circulation Models(GCM) for weather forecasting and prediction. Limitations of the models. R and D institutions in India and abroad dedicated to climate Science, NARL, IITM, CSIR Centre for Mathematical Modeling and Computer Simulation, and many more.	13
Unit-III	

Global Climate Change: Green house effect and global warming, Enhancement in concentration of carbon dioxide and other green house gases in the atmosphere, Conventional and non-conventional energy sources and their usage. EL Nino/LA Nino Southern oscillations. Causes for global warming: Deforestation, fossil fuel burning, industrialization. Manifestations of global warming: Sea level rise, melting of glaciers, variation in monsoon patterns, increase in frequency and intensity of cyclones, hurricanes, tornadoes Geo-engineering as a tool to mitigate global warming, Schemes of geo-engineering.	13

Activity for tutorial classes (01 hour/week)

1. Try to find answer to the following questions:
   (a) Imagine you are going in a aircraft at an altitude greater than 100 km. The air temperature at that altitude will be greater than 200°C. If you put your hands out of the window of the aircraft, you will not feel hot.
   (b) What would have happened if ozone is not present in the stratosphere.
2. Visit a nearby weather Station and learn about their activities.
3. Design your own rain gauge for rainfall measurement at your place.
4. Learn to determine atmospheric humidity using wet bulb and dry bulb thermometers.
5. Visit the website of Indian Institute of Tropical Meteorology (IITM), and keep track of occurrence and land fall of cyclone prediction.
6. Learn about ozone layer and its depletion and ozone hole.
7. Keep track of melting of glaciers in the Arctic and Atlantic region through data base available over several decades.
8. Watch documentary films on global warming and related issues (produced by amateur film makers and promoted by British Council and BBC).

Reference Books

1. Basics of Atmospheric Science A Chndrashekar, PHI Learning Private Ltd. New Delhi, 2010.
2. Fundamentals of Atmospheric Modelling- Mark Z Jacbson, Cambridge University Press, 2000.

Phy-OE3: Astronomy (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I : History and Introduction	Hrs.
Ancient Astronomy: Greek Observations, Sumerian Observations, Mayan Observations, Arabic Observations ,Chinese Observations (2 hours) **Indian Astronomy:** Vedic Astronomy, Ancient Astronomy – Aryabhata, Varahamihira, Bhaskara, Astronomy in Indian Scriptures, Precession of the Equinox, Celebrations of Equinox (2 hours) **Medieval & Modern Astronomy:** Invention of Telescopes, Models of the Solar System & Universe, Observations by Tycho Brahe, Kepler, Galileo, Herschel and Other, Modern Astronomy (3 hours) **Optical Tools for Astronomy:** Pin Hole, Binoculars, Telescopes & Imaging (1 hour) **Mathematical Methods of Observations:** Angular Measurement, Trigonometric functions, Stellar Parallax (2 hour) **Observational Terminologies:** Cardinal Directions, Azimuth, Altitude, Measurements using Compass and Hand, Equatorial Co-ordinates, Light years, Magnitude, Colors etc. (3 hours)	13
Unit-II: Observations of the Solar System	
The Sun: Ecliptic and the Orientation of the Earth, Seasons - Solstices and Equinox, Observations of the Sun from Earth during seasons, Eclipses, Zero-shadow day, Sunspots (3 hours) **The Moon:** Earth-Moon system – Phases, Lunar Eclipses, Ecliptic and Lunar Orbital Plane – Nodes, Lunar Month, Full Moon Names (3 hours) **Inner Planets: Mercury & Venus** - Observational History, Observational Windows, Appearance, Apparitions, Elongations, Superior Conjunctions, Inferior Conjunctions, Transits. (4 hours) **Outer Planets: Mars, Jupiter & Saturn** - Observational History, Observational Windows, Appearance, Frequency of Oppositions, Conjunctions, Moons Eclipses, Galilean Moons, Saturn's Rings (3 hours)	13

Unit-III: Major Astronomy Observations	
March to June: Prominent Stars and Constellations Visible during this period, Methods of Spotting. (4 hours) **June to September:** Prominent Stars and Constellations Visible during this period, Methods of Spotting. (5 hours) **September to December:** Prominent Stars and Constellations Visible during this period, Methods of Spotting. (3 hours) **December to March:** Prominent Stars and Constellations Visible during this period, Methods of Spotting. (3 hours)	13

Activity for tutorial classes (01 hour/week)

1. Measuring Seasons using Sun's Position.
2. Measuring Distance using Parallax
3. Estimation of the Stellar Diameter using Pin Hole
4. Measuring Height of an Object Using Clinometer.
5. Star spotting using constellation maps
6. Constellation spotting using Skymaps
7. Estimation of 'Suitable Periods' to observe deep sky objects using Planisphere
8. Estimation of the Size of the Solar System in using Light Years.
9. Identification of Lunar Phases across a year.
10. Measuring Constellation of the Sun using Night Skymaps or Planispheres

Reference Books

1. The Stargazer's Guide - How to Read Our Night Sky by Emily Winterburn
2. A guide to the Night Sky – Beginner's handbook by P.N. Shankar
3. The Complete Idiot's guide to Astronomy by Christopher De Pree and Alan Axelrod

Phy-OE4: Medical Physics (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Human Anatomy and Physiology: Overview of human anatomy - cells, cell structure, type of cells and their functions, tissues, organs, and their functions. Different systems in the human body, their structure and function, physiological properties of the circulatory system, digestive system, respiratory system, reproductive system, excretory system, endocrine system and nervous system.	13
Unit-II	
Physics of Medical Diagnostics: Principle of production of X-rays. Use of X-rays in medical diagnosis, X-ray imaging systems. Computed Tomography (CT): principle and generation of CT Magnetic Resonance Imaging (MRI): basic principle and image characteristics. Ultrasound Imaging: Interaction of sound waves with body tissues, production of ultrasound, transducers, acoustic coupling, image formation, modes of image display and color Doppler.	13
Unit-III	
Physics of Radiotherapy: Clinical aspects of radiation therapy: Biological basis of radiotherapy, radiation sources, radiation dose, time dose fractionation. External beam radiation therapy, radiation therapy modalities, production of radioisotopes, use of radioisotopes in therapy, particle and ion beam radiotherapy. Brachytherapy - principle of brachytherapy and classification of brachytherapy techniques.	13

Activity for tutorial classes (01 hour/week)

1. Demonstrate the shape, size, positions and functions of different organs in the body with the help of models.
2. Visit any hospital/diagnostic centers to study the working of X-ray machines. Learn how X-rays are used in the diagnosis of the fractured bone
3. Prepare a short report on the principle and use of X-ray films in imaging.
4. Observe that as the density of materials between the gamma source and the detector changes the reading on the meter (or intensity of the beeping sound) changes.
5. Visit any ultrasound diagnostic center to study the principle and use of ultrasound in diagnosis.
6. Visit any radiotherapy center to study the modalities of radiotherapy.
7. List out different type of cancers and possible causative factors. List out the healthy practices to reduce the risk of cancers.
8. Group discussions on the medical physics programme in general.

Text and Reference Books

1. C. H. Best and N. B. Taylor. A Test in Applied Physiology. Williams and Wilkins Company, Baltimore, 1999.
2. C. K. Warrick. Anatomy and Physiology for Radiographers. Oxford University Press, 2001.
3. Jerrold T. Bushberg. The Essential Physics for Medical Imaging (2nd Edition). Lippincott Williams & Wilkins. 2002.
4. Jean A. Pope. Medical Physics: Imaging. Heinemann Publishers, 2012.
5. Faiz M. Khan and Roger A. Potish. Treatment Planning in Radiation Oncology. Williams and Wilkins, USA, 2003.
6. D. Baltas. The physics of modern brachytherapy for oncology. Taylor and Francis, 2007.
7. J. R. Brobek. Physiological Basis of Medical Practice. Williams and Wilkins, London, 1995.
8. Edward Alcamo, Barbara Krumhardt. Barron's Anatomy and Physiology the Easy Way. Barron's Educational Series, 2004.
9. W. E. Arnold Taylor. A textbook of anatomy and physiology, Nelson Thornes, 1998
10. G. S. Pant Advances in Diagnostic Medical Physics Himalaya Publishing House, 2006.
11. Faiz M Khan. The Physics of Radiation Therapy (3rd edition). Lippincott Williams & Wilkins, USA, 2003.
12. Jatinder R. Palta and T. Rockwell Mackie Intensity Modulation Radiation Therapy. Medical Physics publishing, Madison, Wisconsin, 2003
13. Peter Hoskin, Catherine Coyle. Radiotherapy in Practice, Oxford University Press, 2011.
14. W. R. Handee. Medical Radiation Physics. Year Book Medical Publishers Inc., London, 2003.
15. Steve Webb. The Physics of Three-Dimensional Radiotherapy. Institute of Physics Publishing, Bristol and Philadelphia, 2002

Phy-OE5: Optical Instruments (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Basics of Optics: Scope of optics, optical path, laws of reflection and refraction as per Fermat's principle, magnifying glass, Lenses (thick and thin), convex and concave lenses, Lens makers formulae for double concave and convex lenses, lens equation. Focal and nodal points, focal length, image formation, combination of lenses, dispersion of light: Newton's experiment, angular dispersion and dispersion power. Dispersion without deviation. (No derivations; concepts to be discussed qualitatively).	13
Unit-II	
Camera and microscopes: Human eye (constitution and working), Photographic camera (principle, construction and working), construction, working and utilities of (i) Simple microscopes (ii) Compound microscope (iii) Electron microscopes (iv) Binocular microscopes **Self study:** Experimental determination of magnifying power of a microscope.	13
Unit-III	
Telescopes and Spectrometer: Construction, working and utilities of (i) Astronomical telescopes (ii) Terrestrial telescopes (iii) Reflecting telescopes, Construction, working and utilities of Eyepieces or Oculars (Huygen, Ramsden's, Gauss) Specuromeler – Construction, working and utilities, measurement of refractive index. **Self study:** Telescopes used at different observatories in and outside India.	13

Activity for tutorial classes (01 hour/week)

1. Find position and size of the image in a magnifying glass and magnification.
2. Observe rain bows and understand optics. Create a rainbow.
3. Find out what makes a camera to be of good quality.
4. Observe the dispersion of light through prism.
5. Make a simple telescope using magnifying glass and lenses.
6. Learn principle of refraction using prisms.
7. Check bending of light in different substances and find out what matters here.
8. Learn about different telescopes used to see galaxies and their ranges.

Weblinks: https://spark.iop.org, http://www.yenka.com, https://publiclab.org etc.

Reference Books

1. Galen Duree. Optics for Dummies. Wiley. 2011.
2. Blaker J W. Optics: An Introduction for Students of Engineering. Pearson, 2015.
3. Hecht E. Optics. Pearson. 5th Edition, 2019.
4. Khurana A K. Theory And Practice Of Optics & Refraction. Elsevier India 2016.
5. FlexBooks® 2.0 https://flexbooks.ck12.org/cbook/ck-12-middle-school-physical-science-flexbook-2.0/section/19.9/primary/lesson/optical-instruments-ms-ps/

Phy-OE6: Sports Science (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Measurement: Physical quantities, Standards and Units, International system of Units, Standards of time, length and mass, Precision and significant figures (4 hours) **Newton's laws of motion:** Newton's first law. Force, mass. Newton's second law. Newton's third law, Mass and weight. Applications of Newton's laws. (5 hours) **Projectile motion:** Shooting a falling target, Physics behind Shooting, Javelin throw and Discus throw. **(4 hours)** **Topics for self study:** https://www.real-world-physics-problems.com/physics-of_sports.html	13
Unit-II	
Conservation laws: Conservation of linear momentum, collisions – elastic and inelastic. Angular momentum. (Physics behind Carom, Billiards, Racing) (4 hours) **Centre of mass:** Physics behind Cycling, Rock climbing, Skating (5 hours) **Gravitation:** Origin. Newton's law of gravitation, Archimedes's principle, Buoyancy & Physics behind swimming (4 hours) **Topic for self-study:** Archimedes' Principle: Made EASY	Physics in You tube	13
Unit-III	
Food and Nutrition: Proteins, Vitamins, Fat. Blood pressure. Problems due to the deficiency of vitamins. (4 hours) **Energy:** Different forms of Energy, Conservation of mass-energy (3 hours) **Physical exercises:** Walking, Jogging and Running, Weight management. (3 hours) **Topic for self-study:** 10 Best Exercises for Everyone – Healthline	13

Activity for tutorial classes (01 hour/week)

1. Identify the methods of measurement of time, length and mass from ancient time and build models for them. (Reference : History of measurement – Wikipedia *https://en.wikipedia.org › wiki › History_of_measurement*)
2. Identify Physics principles behind various Sports activities. https://www.real-world-physics-problems.com/physics-of-sports.html
3. List the difficulties experienced in Gymnastics, Cycling and Weight lifting.
4. List the difficulties experienced in swimming.
5. Learn breathing exercises.
6. Write an essay on Physical health v/s Mental health or conduct a debate on Physical health v/s Mental health.

Text Books

1. Yakov Perelman. Physics for Entertainment. Createspace Independent Pub, 2010.
2. Yakov Perelman. Physics Everywhere. Prodinnova Publishers, 2014.
3. Yakov Perelman. Mechanics for Entertainment. Prodinnova Publishers, 2014.
4. Vassilios McInnes Spathopoulos. An Introduction to the Physics of Sports. Createspace Independent Publishing Platform, 2015.
5. Walter Lewin. For the Love of Physics. Taxmann Publications Pvt. Ltd., 2012.
6. Swaminathan M. Handbook of Food and Nutrition. Bangalore Press. 2012.
7. Srilakshmi B. Food Science. New Age International Pub. 2015.

Internet Resources for Reference: Internet resources

https://www.topendsports.com/biomechanics/physics.htm
https://www.real-world-physics-problems.com/physics-of-sports.html
https://www.healthline.com/
https://www.mayoclinic.org/
https://www.who.int/news-room/

Phy-OE7: Nanotechnology (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Introduction to nanomaterials: Length scales in physics, Nanostructures: 1D, 2D and 3Dnanostructures (nanodots, thin films, nanowires, nanorods). Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equationInfinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.	13
Unit-II	
Synthesis and Characterization of nanostructure materials: Top down and Bottom up approach, Photolithography. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Transmission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.	13
Unit-III	
Properties and applications of nanomaterials: Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasiparticles and excitons, charging effects. Radiative processes: General formalization-absorption, emission and luminescence. Optical properties of heterostructures and nanostructures. Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Nanomaterial Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots – magnetic data storage. (13 hours)	13

Activity for tutorial classes (01 hour/week)

1. Synthesis of metal nanoparticles by chemical route.
2. Synthesis of semiconductor nanoparticles.
3. XRD pattern of nanomaterials and estimation of particle size.
4. To study the effect of size on color of nanomaterials.
5. Growth of quantum dots by thermal evaporation.
6. Prepare a disc of ceramic of a compound using ball milling, pressing and sintering, and study its XRD.
7. Fabricate a thin film of nanoparticles by spin coating (or chemical route) and study transmittance spectra in UV-Visible region.
8. Prepare a thin film capacitor and measure capacitance as a function of temperature or frequency.
9. Visit to nearby research labs to study the working of XRD, SEM, UV-Visible Spectrophotometer instruments
10. Visit to nearby research labs for project work and interaction with scientists at IISC, JNCSR, Universities etc.

References Books

1. C P Poole, Jr. Frank J. Owens, Introduction to Nanotechnology. Wiley-Interscience. 2002
2. Kulkarni S K. Nanotechnology: Principles & Practices. Capital Publishing Company, 2011.
3. Chattopadhyay K K , Banerjee A N. Introduction to Nanoscience and Technology. PHI Learning Private Limited, 2009.
4. Richard Booker, Earl Boysen, Nanotechnology for Dummies. John Wiley and Sons, 2005.
5. Hosokawa M, Nogi,K, Naita M, Yokoyama T.Nanoparticle Technology Handbook Elsevier, 2007.
6. V.V. Mitin V V, Kochelap V A and Stroscio M A. Introduction to Nanoelectronics. Cambridge University Press, 2011.
7. Bharat Bhushan. Springer Handbook of Nanotechnology. Springer-Verlag, 2004.

Phy-OE8: Electrical Instruments (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Voltage and current sources, Kirchoff's current and voltage laws, loop and nodal analysis of simple circuits with dc excitation. Ammeters, voltmeters: (DC/AC) (3 hours) Representation of sinusoidal waveforms, peak and rms values, power factor. Analysis of single-phase series and parallel R-L-C ac circuits. Three-phase balanced circuits, voltage and current relations in star and delta connections. Wattmeters: Induction type, single phase and three phase wattmeter, Energy meters: AC. Induction type single phase and three phase energy meter. (5 hours) Instrument Transformers: Potential and current transformers, ratio and phase angle errors, phasor diagram, methods of minimizing errors; testing and applications. (5 hours) **Topics for self study:** Types of switches and Circuits, Safety precautions and rules in handling electrical appliances, Electric shock, first aid for electrical shocks, Fuses, MCB, ELCB and Relays, Filament lamp, Tube light, CFL and LED	13
Unit-II	
Galvanometers: General principle and performance equations of D'Arsonval Galvanometers, Vibration Galvanometer and Ballistic Galvanometer. (3 hours) Potentiometers: DC Potentiometer, Crompton potentiometer, construction, standardization, application. AC Potentiometer, Drysdale polar potentiometer; standardization, application. (3 hours) DC/AC Bridges :General equations for bridge balance, measurement of self inductance by Maxwell's bridge (with variable inductance & variable capacitance), Hay's bridge, Owen's bridge, measurement of capacitance by Schearing bridge, errors, Wagner's earthing device, Kelvin's double bridge. (7 hours) **Topics for self study:** Importance of grounding and Earthing, Methods for Earthing.	13
Unit-III	
Transducer: Strain Gauges, Thermistors, Thermocouples, Linear Variable Differential Transformer (LVDT), Capacitive Transducers, Peizo-Electric transducers, Optical Transducer, Hall Effect Transducer (6 hours) CRO: Block diagram, Sweep generation, vertical amplifiers, use of CRO in measurement of frequency, phase, Amplitude and rise time of a pulse Digital Multi-meter: Block diagram, principle of operation (3 hours) Basics of lead acid batteries, Lithium Ion Battery , Battery storage capacity, Coulomb efficiency, Numerical of high and low charging rates, Battery sizing. (4 hours) **Topics for self study:** Fuses, MCB, ELCB and Relays, Filament lamp, Tube light, CFL, and LED	13

Activity for tutorial classes (01 hour/week)

1. Identify variety of electrical switches and note down their applications/utility.
2. Identify the hazards involved in handling electrical circuits and instruments, make a list of safety precautions as well as first aid for electrical shocks.
3. Make a study of importance of grounding in electrical circuits.
4. Prepare a detailed account of various methods of earthing and their utility/ applications.
5. Prepare a document on evolution of incandescent bulbs to the present day LED lights.
6. Make a comparative study of Fuses, MCB, ELCB and Relays highlighting their use and applications

References Books

1. Sawhney A K. A Course in Elec. & Electronics Measurements & Instrumentation. Dhanpatrai & Co, 1978.
2. Helfrick A D, Cooper W D. Modern Electronic Instrumentation and Measurement Techniques. PHI, 2016.
3. Kulshreshtha D C. Basic Electrical Engineering. Mc Graw Hill Publications, 2019.
4. David G Alciatore and Michel B Histand. Introduction to Mechatronics and Measurement Systems. Tata McGraw Hill Education Private Limited, 3rd Edition, 2015.
5. Vincent Del Toro. Electrical Engineering Fundamentals. Prentice Hall India, 2009.

Suggestions for (optional) experiments to be performed/demonstrated in the Laboratory

Sl No	Experiment
1	Introduction to Lab Equipment
2	Voltmeter Design
3	Ammeter Design
4	Ohmmeter Design
5	Multimeter Design
6	Measurement of Resistance using Wheatstone Bridge
7	Measurement of Capacitance using Schering Bridge
8	Measurement of Inductance using Maxwell Bridge
9	Measurement of Light Intensity
10	Measurement of Temperature

Phy-OE9: Physics for all (Credits:3)
3 hour teaching + 01 hour tutorial per week

Unit-I	Hrs.
Energy and Power: Explosions and energy; Energy, heat and its units; Energy table and discussions, Discussion of cost of energy; Measuring energy; Power; Different power sources; Kinetic energy.	13
Unit-II	
Gravity, Force and Space: The force of Gravity; Newton's third law; Weightlessness, Low earth orbit; Geosynchronous satellites; Spy satellites; Medium Earth Orbit satellite, Circular Acceleration; momentum; Rockets; Airplanes, helicopters and fans; Hot air and helium balloons; angular momentum and torque..	13
Unit-III	
Nuclei and radioactivity: Radioactivity; Elements and isotopes; Radiation and rays; Seeing radiation; The REM – The radiation poisoning; Radiation and cancer; The linear hypothesis; Different types of radiation; The half-life rule; Smoke detectors; measuring age from radioactivity; Environmental radioactivity; Glow of radioactivity; Nuclear fusion.	13

References Book

This course is extracted from the book titled "Physics and Technology for Future Presidents: An Introduction to the Essential Physics Every World Leader Needs to Know" by Richard A Mutler, WW Norton and Company, 2007. (Unit-I to 4 are from chapters 1, 3, 4 and 10, respectively).

COURSE PATTERN & SCHEME OF EXAMINATION for B.Sc. / B.Sc. (Hons.) as per NEP-2020

Sl. No	Semester	Title of the Paper	No of hrs	Hrs per week	Marks				Duration of Examination (hours)	Total Marks	Credits
					Theory/ Practicals		Internal Assessment (IA)				
					Max	Min	Max	Min			
1	I Semester	Phy-DSCT1: Mechanics and Properties of Matter	52	4	60	21	40	14	3	100	4
		Phy-DSCP1-Lab I	40	4	25	09	25	09	3	50	2
		Phy-OE1 to Phy-OE9 (See list below for titles of Pool A open elective papers)1072355930	39	3	60	21	40	14	3	100	3
2	II Semester	Phy-DSCT2: Electricity and Magnetism	52	4	60	21	40	14	3	100	4
		Phy-DSCP2-Lab II	40	4	25	09	25	09	3	50	2
		Phy-OE1 to Phy-OE9 (See list below for titles of Pool A open elective papers which were not chosen during I Semester)	39	3	60	21	40	14	3	100	3

Open Electives: Pool A

Phy-OE0: Energy Sources
Phy-OE2: Climate Science
Phy-OE3: Astronomy
Phy-OE4: Medical Physics
Phy-OE5:Optical Instruments
Phy-OE6: Sports Science
Phy-OE7: Nanotechnology
Phy-OE8:Electrical Instruments
Phy-OE9: Physics for All

Formative/Internal Assessment for Theory Papers	
Assessment Occasion	**Marks**
Test-1 (Activity related– self study)	20
Test-2 (Theory based)	20
Total	40

Note: No questions to be set on topics of self-study

The mark distributions for the final practical examination is as follows:

1. Writing Principle / Statement / Formula with explanation of symbols and units	03 Marks
2. Diagram/ Circuit Diagram/ Expected Graph	03 Marks
3. Setting up of the experiment + Tabular Columns + taking reading	08 Marks
4. Calculations (explicitly shown) + Graph	04 Marks
5. Accuracy of results with units	02 Marks
6. Class Records (to be valued at the time of practical examinations)	05 Marks
Total for Practical Examinations	**25 Marks**
Note: Wherever explicit setting up of experiments does not exist like in the case of spectral charts or pre-acquired data is involved (Astrophysics or atmospheric experiments), the marks for setting up of experiment may be provided for Additional graphs and formulae	

QUESTION PAPER PATTERN FOR I BSc PHYSICS DEGREE EXAMINATION

BENGALURU CITY UNIVERSITY

I Semester B.Sc. Degree Examination

(2021-22)

Phy-DSCT1: Mechanics and Properties of Matter

Duration: 2 Hours] *[Max. Marks: 60*

PART	INSTRUCTIONS TO CANDIDATES	MARKS
Part- A	Answer **all** the questions Each question carries 1 mark	5 x 1 = 5
Part- B	Answer any **THREE** questions out of **FIVE** Each question carries **10 marks**	3 ×10 =30
Part- C	Solve any **THREE** problems out of **FIVE**. Each problem carries 5 marks	3 ×5 = 15
Part- D	Answer any **FIVE** out of **EIGHT** questions. Each question carries 2 marks:	5 ×2 = 10
	TOTAL	60 MARKS

BENGALURU CITY UNIVERSITY

I Semester B.Sc. Degree Examination

Phy.DSCT1: Mechanics Properties of Matter

Time: 2 Hours] *[Max. Marks: 60*

Instructions to Candidates:

1. *Answer **all** the questions from PART- A*
2. *Answer **any three** questions from PART- B and PART C*
3. *Answer **any five** questions from PART -D*
4. *Use of non-programmable scientific calculator is allowed.*

PART-A

Answer **all** the questions. Each question carries **1 mark**. **(5 x 1 = 5)**

1. The dimension of Gravitational constant is _____

   (a) $[M^{-1} L^{3} T^{-2}]$ (b) $[M^{-1} L^{2} T^{-2}]$

   (c) $[M^{-1} L^{3} T^{-3}]$ (d) $[M^{-2} L^{3} T^{-2}]$

2. In the case of uniform circular motion of a body, which one of the following physical quantities does not remain constant?

   (a) mass (b) speed

   (c) linear momentum (d) kinetic energy

3. The modulus of elasticity of a material does not depend upon

   (a) shape (b) temperature

(c) nature of material (d) impurities mixed

4. The fluid flow remains streamlined as long as it's velocity is _____.

(a) below its critical velocity (b) equal to the square of its critical velocity

(c) equal to critical velocity (d) equal to the square root of its critical velocity

5. The cause of surface tension is

(a) intermolecular forces (b) viscous force

(c) gravitational force (d) nuclear force

PART B

Answer any **THREE** questions. Each question carries 10 **marks**: (3 × 10 = 30)

6 a) Derive an expression for work done by a variable force.

b) Obtain an expression for length contraction of a moving rod on the basis of special theory of relativity. (5+5)

7 Derive an expression for the moment of inertia of a plane rectangular lamina about an axis passing through its centre and perpendicular to its (i) plane, (ii) length and (iii) breadth (10)

8 a) State Kepler's laws of planetary motion.

b) Derive an expression for orbital velocity of a satellite orbiting with a radius 'r' centered on the planet. (3+7)

9 a) What is surface tension? Write its SI unit.

b) Derive an expression for the difference of pressure between the two sides of a curved liquid surface (2+8)

10 a) Obtain an expression for terminal velocity of a small solid sphere falling freely under gravity in a viscous liquid.

b) Describe with diagram an experiment to determine the coefficient of viscosity of a liquid by Poiseuille's method. (5+5)

PART C

Solve any **THREE** problems. Each problem carries 5 **marks**. (3 ×5 = 15)

11 A clock keeps correct time. With what speed should it be moved related to an observer so that it may seem to loose one minute in one- day.

12 A car of mass 1500 kg moves with a linear speed of 40 ms^{-1} on a circular race track of radius 50 m. What is the magnitude of its angular velocity and angular momentum relative to the centre of the track?

13 The force of attraction between two sphere of masses 40 kg and 10 kg equal to the weight of a body of mass 10.94×10^{-9} kg. If the distance between the centres of the spheres is 0.5 m, calculate the value G. Given g=9.8 ms^{-2}

14 Calculate the force required to stretch a steel wire 1×10^{-4} m^2 in cross section to increase its length by 0.1% of its original length. Given Young's modulus = $2 \times 10^{11} Nm^{-2}$.

15 Calculate the excess pressure inside a soap bubble of radius 3×10^{-3} m. Surface tension of soap solution =20×10^{-3} Nm^{-1}. Also calculate the surface energy.

PART D

Answer any **FIVE** questions. Each question carries **2 marks**: **(2 ×5 = 10)**

16 a) How random errors and systematic errors be reduced?

b) Can a body have energy without momentum? Justify.

c) Why is most of the mass concentrated at the rim in a flywheel?

d) When an object falls to the earth, the earth also moves up to meet it. Why the earth's motion is not noticeable?

e) Can steel be preferred than copper for making springs? Explain.

f) Can Poisson's ratio of any material be less than –1? Explain.

g) Water sticks to a glass surface, while mercury does not. Explain.

h) Which type of flow is preferred for mixing of two fluids? Explain.

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

BENGALURU CENTRAL UNIVERSITY, BENGALURU

MA Economics Syllabus
(CBCS)

With Effect from Academic Year
2018-19 Onwards

FIRST SEMESTER		
Hard Core		
I	1.1	Advanced Microeconomics I
I	1.2	Advanced Macroeconomics I
I	1.3	Mathematical Methods in Economics
Soft Core		
I	1.4.1	Indian Economics
I	1.4.2	Economic Thought
I	1.4.3	Institutional Economics
I	1.4.4	Regional Economics
SECOND SEMESTER		
II	2.1	Advanced Microeconomics II
II	2.2	Advanced Macroeconomics II
II	2.3	Statistical Methods in Economics
Electives		
II	2.4.1	Agricultural Economics
II	2.4.2	Urban Economics
Open Electives		
II	2.5.1	Indian Economics
THIRD SEMESTER		
III	3.1	Development Economics
III	3.2	International Economics
III	3.3	Econometrics-I
Electives		
III	3.4.1	Industrial Economics
III	3.4.2	Environmental Economics
Open Electives		
III	3.5.1	Globalization and Economy
FOURTH SEMESTER		
IV	4.1	Public Economics
IV	4.2	Econometrics-II
IV	4.3	Project Work
Electives		
IV	4.4.1	Financial Economics
IV	4.4.2	Economics of Infrastructure
IV	4.4.3	Economic Demography
IV	4.4.4	Economics and Law

Course: M.A. in Economics
Semester: I Semester
Title of paper: Microeconomics I
(Compulsory)

Credits: 4
Total hours: 60

Course Objectives

•To teach the microeconomic theory of consumers' behaviour and demand, firms' behaviour and production, and markets in partial equilibrium.
•To distinguish the market and optimising behaviour of microeconomic agents.
•To teach the basic tools and techniques for microeconomic analyses.

MODULE I: INTRODUCTORY (4 HOURS)

Nature and scope of micro economics: Determination of allocation of resources and relative prices - Positive and normative approaches, Static and dynamics, Partial and general equilibrium, Comparative statics

MODULE-II CONSUMER BEHAVIOUR AND DEMAND (15 HOURS)

Nature of consume behaviour, consumer choice in the cardinal utility analysis, Ordinal theory-Indifference curve approach, representative consumer, assumptions on consumer's preference, representation of consumer's preference by indifference curves, properties of indifference curves, budget set and budget line- slope of indifference curve and Marginal rate of substitution - Consumer's equilibrium, utility maximization and expenditure minimization, Marshallian and Hicksian demand functions – Comparative statics: Price and income effects on equilibrium demand – Slutsky's equation – Duality in consumption: Indirect utility function and expenditure function ; Roy's Identity and Shephard's Lemma – Consumer's welfare: Concept and measurement of consumer surplus

MODULE-III FIRM'S BEHAVIOUR AND PRODUCTION (10 HOURS)

Nature and types of cost of production and revenue to a firm – Fixed cost, variable cost, average variable cost, average cost, marginal cost – Total revenue, average revenue and marginal revenue – Production function - Returns to scale – Elasticity of substitution – Isoquants – Marginal rate of technical substitution -Profit function and cost function – Profit maximization and cost minimization ···Input demand functions- Duality in production: Hotelling's Lemma - Functional form and properties of select production functions: Cobb-Douglas, Leontief and Constant Elasticity of substitution – Producer's welfare: Concept and measurement of producer surplus

MODULE-IV: THEORY OF MARKETS IN PARTIAL EQUILIBRIUM

Introduction to market structure and types of markets (2 HOURS)

Market structure - Factor and product markets – Spot, future and forward markets- Perishable and durable markets –Concept of market equilibrium and market disequilibrium.

Perfect competition (8 HOURS)

Conditions of perfect competition, demand and supply curve of a firm and industry- Profit maximization – Market equilibrium in short run and long run equilibrium - Properties of market equilibrium – stability and efficiency – Consumer surplus and producer surplus

Theory of monopoly(8 HOURS)

Types of monopoly - Price and output determination of a firm/industry – Comparison of price and output between monopoly and perfect competition - Monopoly power- Discriminatory monopoly: Market segmentation and multi-part pricing, degree of price discrimination - Bilateral monopoly – Consumer surplus and producer surplus - Monopsony

Theory of monopolistic competition (5 HOURS)

Imperfect competition and monopolistic competition - Importance of product differentiation – Market equilibrium in short and long term – Comparison of profit maximization conditions between perfect competition, monopoly and monopolistic competition- Problems of monopolistic industries: Selling costs, sunk costs and excess capacity

Theory of Oligopoly(8 hours)

Features of oligopolistic market – collusive and non-collusive oligopoly- models of non-collusive oligopoly with homogenous products: Price and output determinations under Cournot duopoly and Stackelberg equilibrium – Models of non-collusive oligopoly with heterogenous products - Kinked demand curve and Bertrand competition.

Reading List

Micro Economics.

RJD Allen. (1978). Theory of firms. Penguin

N. Gregory Mankiw. (2014). Principles of Microeconomics. Cengage Learning

Campbell McConell, Stanley Brue, and Sean Flynn. (2014). Microeconomics: Principles, Problems, & Policies. McGraw-Hill Series in Economics

Paul Krugman and Robin Wells. (2014). Microeconomics. Worth Publishers

Karl E. Case, Ray C. Fair and Sharon E. Oster. (2013). Principles of Microeconomics. Pearson India

Koutsoyiannis A. (1985). Modern Microeconomics. ELBS/Macmillan, Hong Kong.

Robert S. Pindych, Daniel L. Rubinfeld and Prem L. Mehta. (2009). Miroeconomics. Pearson International Edition

Felix Muñoz-Garcia. (2017). Advanced Microeconomic Theory: An Intuitive Approach with Examples. MIT Press

W. D. A. Bryant and William David. (2017). Advanced Microeconomics: Theory, Applications and Tests. World Scientific Publishing Company Pte Limited.

H L Ahuja. (2016). Advanced Economic Theory-Microeconomic Analysis. S. Chand Publishing

H.L. Ahuja. (2016). Advanced Economic Theory-Microeconomic Analysis. S. Chand Publishing

David M. Kreps. (2013). Microeconomic Foundations I: Choice and Competitive Markets. Princeton University Press, New Jersey USA

A.P.S. College of Arts and Science.
M.A in ECONOMICS
Each Subject 5 Copies.
Total Budget is Rs. 30,000.

Course: M.A. in Economics
Semester: I Semester
Title of paper: Macroeconomics I
(Compulsory)

Credits: 4
Total hours 60

Objective of the course

- To teach important concepts, measures and theories of Macroeconomics as they are related to the short term determination of National Income, investment, inflation, monetary and fiscal policies.
- Highlight the practical applications the concepts, measures and theories of macroeconomics.

Module I; Introduction to macroeconomics (12hours)

Nature and scope of macroeconomics – Review of basic concepts: Aggregate demand and aggregate supply; National income and general prices; savings and investment; full employment - Review of macroeconomics methodology – static and dynamics – short term and long macroeconomics - macroeconomic equilibrium and disequilibrium- deterministic and stochastic macro economics

Module II: Short term determination of national income: Demand-side equilibrium (8 hours)

Interest rate in product market; IS curve and determinants of shifts in IS curve – Interest rate in money market; LM curve and determinants of shifts in LM curve

Module III: Macro-Economic Theories of Investment (10 Hours)

The Keynesian, Post-Keynesian, New-Keynesian and the financial theory of investment determination. Lags in investment- Portfolio disequilibrium and the transmission mechanism.

Module IV: Theories of Inflation (10Hours)

Theories of Inflation- Structural and Monetarist Approaches to Inflation; Natural Rate of Unemployment hypothesis-The short & long run Phillips Curve. Imperfect Information and Inflation expectations

Module V: Money, monetary policy and macroeconomic stabilization (10 hours)

The Demand for Money; The classical, Keynesian and Post Keynesian theories of demand for money- Patinkin and Real Balance Effect; Baumol, Tobin; Friedman and the Modern Quantity Theory – Monetary policy: Objectives, instruments and stabilization

Module VI: Fiscal policy and macroeconomic stabilization (10 hours)

Nature and scope of fiscal policy – Concept and definition of fiscal stabilisation - Instrument of fiscal policy: Taxation, expenditure and debt – Fiscal stimulus and stabilisation – Fiscal deficit and stabilisation – Crowding-out effect – Ricardian Equivalence Theorem

Reading list Macro Economics.

Ackley, G Macroeconomics: Theory and Policy, Macmillan, New York, 1978

Dornbusch, Fischer &Startz, Macroeconomics, Tata McGraw-Hill Publishing Co. Ltd, 2012

Willian H Branson , Macroeconomic Theory and Policy, (3rd Edition), Harper and Row, New York,1989

Shapiro, Edward., Macroeconomic Analysis , Golgotia Publications Pvt.Ltd., New Delhi, 2015

Blanchard Olivier & Fischer Stanley. Lectures on Macroeconomics. Cambridge: MIT Press, 2018

Mankiw, G &Romer D, "New Keynesian Economics" Vol-1 & 2. The MIT Press

Hejidra, B.J. and F.V. Ploeg, Foundations of Modern Macroeconomics, Oxford University Press, Oxford, 2001

Romer, D.L. Advanced Macroeconomics, McGraw Hill Company Ltd., New York, 2011

Course: M.A. in Economics
Semester: I Semester
Title of paper: Mathematical Methods in Economics
(Compulsory)

Credits: 4
Total hours: 60

Objectives

- Teach basic mathematical methods in economics by applications of analytic geometry, linear algebra, integral and differentia calculus, static and dynamic optimisation, and game theory.
- Develop computational skills by solving numerical problems.
- Contextualize the mathematical applications in general economics.

Teaching modules

Module 1: Introduction: Need for mathematical methods in economics (2 hours)

Need for mathematical approach in economics - Nature and scope of mathematical methods and economics - Role of economic theory in mathematical economics - Difference between mathematical, statistical and econometric methods

Module 2: Number system and analytic geometry (9 hours)

Number system: Integers, Real Numbers and Real Number Line – Functions: Continuous and discontinuous; Linear and non-linear - Cartesian coordinates: Plane, distance and angle - Area under a linear and non-linear curves: Calculation of triangle. Rectangle and trapezoid – Applications to measurement of consumer surplus, producer surplus, deadweight loss, profits and Lorenz curve

Module 3: Linear algebra (9 hours)

System of linear equations – Simple market equilibrium model and determination of equilibrium demand, supply and price – Introduction to matrix algebra: Types and properties matrices - Solution to system of linear equation using Cramer Rule – Application to determination of equilibrium output and stability in Leontief's Input-Output Model.

Module 4: Calculus (15 hours)

Derivative of a function: Total and partial derivatives – Rules of differentiation – Application to find the slope of a curve: utility, cost and revenue curves; price and income elasticity of demand; growth rate of a variable.

Static optimisation – Formulation of objective functions and constraints for maximization and minimization – Lagrangean function and multiplier method – First order and Second order conditions - Applications of optimization to determine utility and profit maximisation and expenditure and cost minimization.

Integral of a function – Types and rules of integration – Determination of area under a curve - Relationship between integration and differentiation - Application to measurement of consumer surplus, producer surplus and deadweigh: loss.

Linear approximations to a non-linear equation: Taylor Theorem

Module 5: Dynamic analysis (9)

Linear difference and differential equations – Types and properties of linear differential equations – Solution to a differential equation – Application to determination of the Marshallian and Walrasian stability.

Introduction to dynamic optimisation - Overview of methods of Calculation of Variation and Optimal Control Euler Equation - Broad areas of application of dynamic optimisation

Module 6: Game theory (9 hours)

Strategic behaviour and game theory in economics – Basic concepts: Cooperative and non-cooperative games, pure strategy and mixed strategies, extensive and normal form games, two-person and n-Person games - Zero-sum, Two-Person game - Maximin and Minimax strategies – Equilibrium (saddle) points – Concept of Core - Application of basic game theory to duopoly theory: Nash equilibrium.

Module 7: Linear programming (7 hours)

Scope of linear programming – optimisation of a linear function with inequality constraints - Primal and dual problem – Importance of Simplex Method – Data Envelope Analysis and its application in production

Mathematical Methods In Economics.

Reading List

Baumol, Willinm J. (1977). Economic Theory and Operational Analysis. Prentice-Hall (New York).

Chiang, Alpha C. (1984). Fundamental Methods of Mathematical Economics. McGraw-hill International Book Company (New Delhi).

Intriligator, Michael D. (1971). Mathematical Optimization and Economic Theory. Prentice-Hall (New York).

Kamien, Morton I., and Nancy L. Schwartz. (1991). Dynamic Optimization: The Calculus of Variations and Optimal Control in Economics and Management. Elsevier (San Diego).

Kreps, David M. (1990). A Course in Microeconomic Theory, Princeton University Press (New Jersey).

Ray, S.C. (2004). Data Envelopment Analysis: Theory and Techniques for Economics and Operations Research. Cambridge University Press (New York).

Silberberg, Eugene., and Suen, Wing. (2000). The Structure of Economics: A Mathematical Analysis. McGraw-Hill Companies (New York).

Veerachamy, R. (2008). Quantitative Methods for Economists. New Age International Publishers (New Delhi).

Weber, Jean E. (1976). Mathematical Analysis: Business and Economic Applications. Harper & Row Publishers (New York).

Course: M.A. in Economics
Semester: I Semester
Title of paper: Indian Economics
(Soft Core/Elective)

Credits: 4
Total hours: 60

Course Objectives

1. To provide understanding of the various phases of growth of the Indian economy.
2. To familiarize with various plans and initiatives towards development of the economy.
3. To introduce macro level trends, status, issues and policies of the various sectors of Indian Economy

Module 1: Changes in the Indian Economy: Overview (8 Hours)
Indian economy on the eve of India's independence – Historical trends in Indian economy - Recent transformation and performance of the economy since 1991. Trends in GDP by aggregate and sectors- agriculture, industry, and services. Development strategy after independence - Five year Plans and National Economic Reforms- Planning Commission and Niti Aayog - Objectives, strategy, achievements and failures.

Module 2: Growth of Indian agriculture (10 Hours)
Indian Agriculture sector- growth in agriculture and Index of Agricultural Production - Changes in the land system, land tenure system and land reforms in the post-independence era, - Green revolution and capital formation in agriculture. Food security and Public distribution system, Indian agriculture and WTO.

Module 3: Distributional issues in Indian economy (10 Hours)

Challenges of development : Trends in poverty, and inequality – Education and unemployment Poverty alleviation and Employment Generation Programs, MGNREGP Health and Nutrition policies, Education policy- financing of health and education in India.

Module 4; Industrial sector (10Hours)

Industrial policy reforms New Industrial Policy 1991, MSMEs, SSIs and Cottage industries and their importance, Public and Private Sector and their performance, Privatization and disinvestments; recent trends of growth and maturing of Indian industry. Rise in Service Sector- IT sector in India. Role of FDI and MNC's in industrial development, Globalization of Indian economy.

Module 5; Infrastructure (12 Hours)

Infrastructural development – reforms: restructuring, pricing and regulation, changing trends in Rural and Urban Infrastructure. Promotion strategy towards investment in infrastructure – public – private partnership Model (Build-Operate-Transfer (BOT), Build-Own-Operate-Transfer (BOOT), Design-Build-Finance-Operate (DBFO) and Build-Own-Operate (BOO)),Inter-sectoral issues –energy, transport, telecom, Environmental Protection policies in infrastructural development.

Module 6: India's achievements in global economy (10 Hours)
India's ranking in UNDP HDI, Global Competitiveness Index – India's position in World Bank's classification of countries by income levels – India's position in attainment of MDG (Millennium development goals) & SDG (Sustainable development goals).

Reading List: Indian Economics

- Kaushik Basu , Annemie Maertens , The New Oxford Companion to Economics in India, Oxford University Press, USA, 2012
- Uma Kapila, Indian Economy: Performance and Policies, Academic Foundation, 2009
- Bimal Jalan(2012) Emerging India: Economies, Politics and Reforms , Viking (India)
- Datt Ruddar, KPM Sundharam , Indian Economy, S Chand, 2018
- Mishra and Puri , Indian Economy, Himalaya Publishing House, 2018
- Economic Survey, Government of India, (Annual), Ministry of Finance, New Delhi.
- India Development Report, Oxford University Press, Various Issues

Additional readings:

- Dipak Mazumdar and Sandip Sarkar. Globalization, Labour Markets and Inequality in India. Routledge (New York),2008
- Vijay Joshi and IMD Little, India's Economic Reforms, 1991-2001. Clarendon Press (Oxford), 1996
- Vijay Joshi and IMD Little **India** - Macroeconomics and Political Economy 1964-1991. Oxford University Press (New Delhi), 1994
- Nilanjan Banik, The Indian Economy: A macroeconomic Perspective. Sage Publications India Pvt Ltd (New Delhi), 2015
- Anne O. Krueger, Economic Policy Reforms and the Indian Economy. The University of Chicago Press (Chicago), 2011

Course: M.A. in Economics
Semester: I Semester
Title of paper: Economic Thought
(Soft Core/Elective)

Credits: 4
Total hours: 60

Objectives

•To describe the chronological, thematic and systematic progress progression of economic ideas •To provide historical background to modern economic analysis and its implications for current debates in economics

MODULE I- EARLY ECONOMIC THOUGHT (10 Hours)

Nature and significance of the history of economic thought. Early thought, mercantilism, the Physiocrates and social philosophy, Natural order and the circulation of wealth, Laissez Faire.

MODULE II-CLASSICAL POLITICAL PHILOSOPHY (10 Hours)

Smith- naturalism, optimism, Theory of moral sentiments, value and distribution The pessimists- Malthus and Ricardo- Theory of diminishing returns and rent - Theory of exchange value and relative prices - Distribution of income. Economic ideas of Jean-Baptiste Say, John Stuart Mill and Nassau William Senior.

MODULE III-THE SOCIALISTS OF THE EARLY NINETEENTH CENTURY (15 Hours)

Critique of capitalism- The antagonists thought - Charles Fourier - Simonde De Sismondi - Robert Owen - Origin of German Historical School .Rise of socialist thought- economic ideas, the Utopians- State socialism, revolutionary socialism-Marx's, assessment of Marx's Economics.

MODULE IV -RECONSTRUCTION OF ECONOMIC SCIENCE (15 Hours)

Subjectivism and marginalism. Developments in the marginal utility concept. Fully developed subjectivism-economic ideas of the Austrian school. Hedonist school, Lousanne mathematical school, Swedish school. Neo classical Orthodoxy Marshall- competition and equilibrium

MODULE V-NEW ECONOMIC THOUGHT (10Hours)

Keynes-General theory- Keynesian revolution and the monetarist counter revolution. Heterodoxy economics - feminist economics and ecological economics.

Economic Thought

READING LIST

Agnar Sandmo, Economics Evolving: A History of Economic Thought, Princeton University Press (2011)

Gide Charles and Rist Charles (2007) A History Of Economic Doctrines – From the Time of the Physiocrats to the Present Day, (1stIndian Reprint), Surjeet Publications, New Delhi.

Hunt E. K and M Lautzenheiser (2011) History of Economic Thought: A Critical Perspective,3rd Edition, PHI

Roll Eric (1986) A History of Economic Thought, Oxford University Press.

Screpanti, Ernesto and Zamagni, Stefano (2006) An Outline Of The History Of Economic Thought (2nd Edition), Oxford University Press.

Course: M.A. in Economics
Semester: I Semester
Title of paper: Institutional Economics
(Soft Core/Elective)

Credits: 4
Total hours: 60

COURSE OBJECTIVES

- To introduce concepts and theories of institutional economics to the working of political economy.
- To examine the role of institutions in development process.

MODULE I -INTRODUCTION TO INSTITUTIONAL ECONOMICS (5 Hours)

Institutions – Old and new institutional economics. Nature and scope of institutional economics- Social, economic, political and legal institutions- their functions - Formal and informal institutions Institutions and Structural macro economics – Institutional economics and behavioural economics.

MODULE II- PROBLEMS OF INFORMATION ASYMMETRY (15 Hours)

Social vis-à-vis Individual Choices, Neo-classical Maximisation vis-à-vis Methodological Individualism. Perfect information, imperfect information and asymmetric information. Asymmetric information and opportunistic behaviour- Market for lemons, Prisoner's dilemma and Nash equilibrium. Principal-Agent problem. Problem of adverse selection – methods to overcome -Signalling, screening and self-selection. Problem of Moral Hazard. Controlling and preventing moral hazard-controlling the agent, incentive contracts and bonding.

MODULE III- ECONOMIC THEORY OF PROPERTY RIGHTS (10 Hours)

Concepts of property, defining property rights, problems of ill-defined property rights, Externalities-market failure and property rights, Internalization of externalities. Alternative property rights regimes- common property -open access and tragedy of the commons. Collective action and assurance problem.

MODULE IV -TRANSACTION COSTS AND BOUNDED RATIONALITY (15 Hours)

The concept of transaction, Types of market transaction costs and means of transaction costs. Issues relating to transaction costs, Transaction costs and transformation costs. Social cost vis-à-vis individual costs, Identification and measurements of transaction costs. Bounded Rationality, comparative advantages and shortcomings of the legal enforcement mechanism- Coase theorem.

MODULE V–DEVELOPMENT AND INSTITUTIONAL ECONOMICS (15 Hours)

Role of state in the process of institutional change, Social Capital and Economic Development- State in development -governance for development. Economics of corruption-principal-agent framework-incentive structures-the threat system and authority; collusion, preemptive collusion and ex-post collusion; Rent-seeking behavior, and free-riding. Welfare implications of corruption

READING LIST

Geoffrey M Hodgson (Ed).Recent Developments in Institutional Economics, Edward Elgar Publishing (2003)

Groenewegen John et. Al Institutional Economics: An Introduction Palgave Macmillan(2010)

Geoffrey M Hodgson (Ed.) The Economics of Institutions, Edward Elgar(1993).

Kapp William, The Foundations Of Institutional Economics, Routeledge (2011)

North, D. C. Understanding the Process of Economic Change. Princeton University Press (2005)

Course: M.A. in Economics
Semester: I Semester
Title of paper: Regional Economics
(Soft Core/Elective)

Credits: 4
Total hours: 60

Objectives

- To equip the students with the analytical skills required to analyse the regional economic issues
- To understand theory of regional, inter-regional and multi-regional economic growth and empirical measurement of regional growth and development at State and sub-State level in India

Unit 1: Introduction to Regional Economics (5 Hours)
Nature and scope of regional economics – Regional economics and regional science – Regional and Urban Economics; Need for a separate study of regional economics – Concept and types of regions: Administrative, Planning, Agro-climatic, Economic and Functional regions.

Unit 2: Approaches to regional growth (10 Hours)
Approaches to regional growth: Models of regional, inter-regional and multi-regional models; Export base models – Location Theory - Gravity models – Shift-share analysis

Unit 3: Theories of regional economic growth (15 Hours)
Neoclassical models – Dualistic models: Social dualism – Labour surplus model of Arthur Lewis- Migration and development: Harris-Todaro – Core-Periphery models: Myrdal's Cumulative Casuation Hypothesis – Regional Input-output models - New Economic Geography models: Paul Krugman's model of industrial location and development

Unit 4: Concept, definition and measurement of regional economic growth in India (10 hours)
Administrative regions in India: State, District, Taluk and Village; Urban and Rural regions - Concept, definition and measure of State Income (GSDP) - Rural and urban GDP – Differences in estimation of national income (GDP) and State Income (GSDP) - Measurement of inter-regional economic growth at State level – Measurement of intra-state disparities in Karnataka

Unit 5: Approaches to measurement of regional income distribution in India (10 hours)
Measurement of poverty at State level – Measurement of income inequality at State level – Regional disparities in poverty and inequality at State level – Trends in poverty and inequality in Karnataka

Unit 6: Infrastructure and Regional development (10 Hours)
Importance of social and economic infrastructure as a determinant of regional economic growth and development. Inter-state disparity in energy, transport and telecommunication infrastructure – Composite Index of regional economic development – Statistical techniques for construction of the composite index – Applications composite index for measurement inter-regional disparities in India

Reading list

1. B. B. Bhattacharya and S. Sakthivel (2004): Regional Growth and Disparity in India: Comparison of Pre- and Post-Reform Decades, *Economic and Political Weekly*, 39(10), pp. 1071-1077.
2. Capello Roberta. (2016). *Regional Economics*. Routledge (New York).
3. Edgar M. Hoover and Frank Giarratani. (2016). *An Introduction to Regional Economics*. Web-book of Regional Science, Regional Research Institute, West Virginia University. Freely downloadable at: http://www.rri.wvu.edu/WebBook/Giarratani/contents.htm
4. Harry W Richardson (1973): *Regional Growth Theory*, Macmillan.
5. Harry W. Richardson, (1970) *Elements of Regional Economics*. Penguin Books (New York)
6. Harry W Richardson (1969): *Regional Economics: Location theory, Urban structure and regional change*. Weidenfeld & Nicolson (London)
7. MacKay, R. (2003): Twenty Five Years of Regional Development, *Regional Studies*, 37(3), pp 303-17.
8. Hudson, R. (2007): Regions and Regional Uneven Development Forever? Some reflective Comments upon Theory and Practice, *Regional Studies*, 41(9), pp. 1149-1160.
9. Keshab Das (2004): Uneven Development and Regionalism: A Critique of Received Theories, *Economic and Political Weekly*, 39(45), pp. 4917-4925.
10. Peter Nijkamp, Edwin S. Mills, P. C. Cheshire, J. Vernon Henderson, Jacques François Thisse. *Handbook of Urban and Regional Economics. Vol.1. Regional Economics*. North-Holland (Amsterdam). 2007
11. Phillips McCann. (2013). *Modern Urban and Regional Economics*. Oxford University Press (New York).
12. Walter Isard. (1960). *Methods of regional analysis: an introduction to regional science*. Cambridge University Press (Mass).

Course: M.A. in Economics
Semester: II Semester
Title of paper: Microeconomic Theory II
(Compulsory)

Credits: 4
Total hours: 60

Objectives

- Teach the advanced microeconomic theory comprising topics in welfare economics, Walrasian and non-Walrasian general equilibrium, risk and uncertainty and economics of information.
- Develop skills on measurement issues by solving numerical problems.
- Contextualize the applications of the above microeconomic theory in economic policy.

Module 1: Welfare Economics (15 hours)

Nature and scope of welfare economics — Measurement of individual welfare: Consumer surplus, Compensating Variation and Equivalent Variation – Contingent valuation method for welfare measurement - Measurement of social welfare – Arrow's Impossibility Theorem - Social welfare functions: Samuelson-Bergson, Utilitarian/ Benthamite and Rawlsian social welfare functions: Functional forms and properties of social welfare functions.

Module 2: General equilibrium (15 hours)

Walrasian general equilibrium – Determination of relative prices – Walras Law - Properties of equilibrium: Efficiency and Stability – Efficient allocation and Pareto optimality in a pure exchange economy – Fundamental theorems of welfare economics -Breakdown of efficiency allocation conditions: Externality, public goods and theory of second best – Walrasian, Marshallian and Hicksian stability conditions - Introduction to non-Walrasian general equilibrium - Role of non-market clearing conditions – Comparison between Walrasian and Non-Walrasian equilibria – Implications for Reappraisal models in macroeconomics.

Module 3: Risk and uncertainty (15 hours)

Concept of risk and uncertainty -Relationship between risk and uncertainty – Degree of risk and its determination – Consumer behaviour under uncertainty – method of expected utility – Risk behaviour of consumers: Risk aversion and risk premium, risk preference and risk neutrality-Neumann and Morgenstern theory of expected utility maximization -Investment behaviour under uncertainty – Expected net present value criterion – Discount rate

Module 4: Economics of information (10 hours)

Information structure in microeconomic models: Perfect, Imperfect and Asymmetric information - Theory of asymmetric quality information and adverse selection: The Market for Lemons – Asymmetric information and signals – Asymmetric information and moral hazard - Theory of auctions - Types of auctions – Price determination by types of auctions

Reading list Micro Economics

Boadway, Robin W. and Bruce, Neil. (1984). Welfare Economics. Basic Blackwell (London).

Deaton, Angus and JognMuellbauer. (1980). Economics and Consumer Behaviour, Cambridge University Press (Cambridge). .

Cornes, Richard., and Sandler, Todd. (1986). The Theory of Externalities, Public Goods, and Club Goods, Cambridge University Press (London).

Henderson, J.M. and R. E. Quandt. (1980). Microeconomic Theory: A Mathematical Approach, McGraw Hill (New York).

Hicks, J.R. (1972). Value and Capital, Oxford University Press (Oxford).

Kreps, David M. (1990). A Course in Microeconomic Theory, Princeton University Press (New Jersey).

Kreps, David M. (2013). Microeconomic Foundations: Choice and Competitive Markets. Princeton University Press (New Jersey).

Mukherjee, Anjan. (1990). Walrasian and Non-WalrasianEquilibria: An Introduction to General Equilibrium Analysis, Clarendon Press (Oxford).

Perloff, Jeffrey M. (2001). Microeconomics. Pearson Education Asia (Delhi).

Sen, A. (1999). Microeconomics – Theory and Applications, Oxford University Press (Delhi).

Shone, Ronald. (1997). Economic Dynamics, Cambridge University Press (Cambridge).

Starr, Ross M., (1997). General Equilibrium Theory: An Introduction, Cambridge University Press (Cambridge).

Varian, Hal R. (1992). Microeconomic Analysis, 3rd edition, Norton & Company (London)

Course: M.A. in Economics
Semester: II Semester
Title of paper: Macroeconomic Theory II
(Compulsory)

Credits: 4
Total hours: 60

Objectives

- Teach the advanced macroeconomic theory comprising models and theories in open macroeconomics, new classical revolution and models, new Keynesian models and theory of growth.
- Highlight macroeconomic theory from Classical, Neoclassical, Keynesian, New Classical and Counter Keynesian revolution perspectives.
- Develop skills on model building and solving measurement issues.
- Contextualize the relevance of the macroeconomic theory in economic policy.

Teaching modules

Module 1: Open Macroeconomic Models (10 hours)

Features of an open macro economy: Trade, capital mobility and exchange rates– Fixed and flexible exchange rates - Balance of payments: Current and capital account – Open economy and IS-LM framework – Trade and IS curve - Capital mobility and LM curve - Mundell-Fleming Model with perfect capital mobility under fixed and flexible exchange rates; Monetary expansion and exchange rates; Beggar-Thy Neighbour policy and competitive depreciation

Module 2: New Classical Revolution

Introduction (1 hour)

Nature and scope of New Classical Revolution in macroeconomics – Difference between New Classical Revolution and Keynesian approach to aggregate supply and demand analyses

Rational Expectations Model (*10 hours*)

Nature and scope of Rational Expectations – Early contributions: John Muth, Thomas Sargent, Neil Wallace and Robert Barro - Robert E.Lucas model – A simple aggregate supply-demand model with exogenous expectations: Forecasting and Lucas critique – A perfect foresight model with endogenous expectations – A rational expectations model – Equilibrium and forecast errors under rational expectations – Imperfect Information Model of Aggregate Supply Curve – Comparison of equilibrium price and output under different models

Random Walk Theory (5 *hours*)

Random Walk of macroeconomic variables – Trend or secular component and cyclical component of output changes – Detrending data and Stationary process – Random Walk Theory of GDP – Trends and shocks – Effects of shocks: Permanent and transitory – Concepts of trend stationary, difference stationary and trend stationary with breaks – Random Walk of Stock Prices

Real Business Cycle Theory (*5 hours*)

Nature and scope of real business cycle theory – Formulation of equilibrium real business cycle model – specification of parameters, calibrations and propagation mechanisms – Microeconomic foundations for macroeconomic real business cycle theory

Model 3: New Keynesian Models of Price Stickiness (9 hours)

Main features of New Keynesian counterrevolution – Unique differences between New Keynesian and New Classists approach to aggregate demand and supply analyses – Concept of sticky prices under imperfect competition - Mankiw's model of price stickiness

Module 4: Theory of Economic Growth (20 hours)

Concept, definition and measurement of economic growth - Nature and scope of growth theory: Aggregate and disaggregate; Static and dynamic; Equilibrium and disequilibrium

Approaches to growth theory: Keynesian (Kaldor), Structural macroeconomics (Lance Taylor) and Neoclassical

Harrod-Domar Model: Multiplier-accelerator and production function versions; Determinants of long run equilibrium growth of national income; Natural growth rate and warranted growth rate

Solow's model: Basic model: Neoclassical production function and its properties: Output per worker and capital-output ratio – Solution to the basic model: Long run determinants of capital-output ratio and output per worker – Equilibrium growth – Steady state – Transitional dynamics – Covergence debate: Absolute and conditional convergence; Speed of covergence - Technical progress - Golden Rule of Capital Accumulation – Growth Accounting – Solow's residual and total factor productivity

AK

Endogenous growth model: Source of endogenous growth – Need for sources of endogenous growth – Types of endogenous growth models – AK Model of endogenous growth – Comparison between Solow's model and AK Model of endogenous growth in terms of determinants of growth.

Macro Economic Theory

Reading list

Allen, RGD. (1968). Macroeconomic Theory: A Mathematical Treatment. McMillan (New York)

Branson, William H. (1983). Macroeconomic Theory and Policy. Harper & Row (London).

Barro, Robert J., and Sala-I-Martin, Xavier. (1999). Economic Growth, The MIT Press (Mass).

Barro, Robert, J. (1997). Macroeconomics, MIT Press (Mass).

Dornbusch, Rudiger., Fischer, Stanley., and Startz, Richard. (2004). Macroeconomics, Tata McGraw Hill (New Delhi).

Goyal, Ashima. (2017). Macroeconomics and Markets in Developing and Emerging Economies. Routledge (New York).

Mankiw, Gregory, N. (1997). Macroeconomics. Worth Publishers (New York).

Philippe Aghion and Steven Durlauf (eds). (2014).Handbook of Economic Growth, Volume 1A, North-Holland (Amsterdam).

Romer, David. (2006). Advanced Macroeconomics, McGraw Hill (New York).

Stiglitz, Joseph., and Walsh, Carl E. (2002). Principles of Macroeconomics, WW Norton and Company (New York).

Course: M.A. in Economics
Semester: II Semester
Title of paper: Statistical Methods in Economics
(Compulsory)

Credits: 4
Total hours: 60

Objectives

- Teach statistical methods in economics by applications of descriptive statistics, sampling and statistics, classical statistical inference and Bayesian methods.
- Develop computational skills by solving numerical problems and by using actual data.
- Contextualize the statistical applications in empirical economics by using statistical packages.
- Provide statistical foundations for study of econometrics

Teaching modules

Module 1: Introduction (2 lectures)

Nature and scope of statistics in economics – Economic statistics and computational statistics – Statistical methods and econometrics - Types of variables: Univariate and multivariate; random and non-random, continuous and discrete – Types of data: cross section, time series and panel data; sample survey and census data.

Module 2: Descriptive statistics (6 hours)

Objectives of data descriptions – Graphical methods - Measures of central tendency (mean, median and mode) – Measures of dispersion (range, standard deviation, variance, coefficient of variation, interquartile range, mean deviation, skewness and kurtosis) – Measures of linear association between variables (covariance; simple, partial and multiple correlation coefficient; rank correlation coefficient)

Module 3: Probability and random variables (12 hours)

Concept of probability – Theorems on probability – Conditional probability and its theorems Random variable: Continuous and discrete - Probability distribution of random variables: Mean, variance, covariance and correlation coefficient of random variables – Joint distribution of random variables and independence of random variables- Conditional distribution of random variables - Select probability density and distribution functions of discrete random variables: Binomial and Poisson distributions – Select probability density and distribution functions of continuous random variables: Normal, Bivariate Normal, Uniform, Chi-square, Student's t, and F distributions – Central Limit Theorem

Module 4: Sampling theory (10 hours)

Concept of population and sample – Population parameters and sample statistics – Statistical inference - Definition of sampling - Sampling with and without replacement – Random and non-random sampling- Types of random sampling: Simple, systematic and stratified - Sampling distributions of mean and variance – Sampling from normally and non-normally distributed populations– Standard error of sample statistics - Frequency distributions: relative frequency distributions and empirical probability distributions

Module 5: Theory of estimation and tests of hypotheses (15 hours)

Statistical estimation: Estimate, estimator and estimation– Biased and unbiased estimator – Point estimate and interval estimates – Confidence intervals - Confidence interval for means and variances in small and large samples

Statistical hypotheses - Null and alternative hypotheses – Type I and Type II errors – Power of a test - Tests of hypotheses and significance — Level of significance - Tests based on sampling from Normal distribution – One-tailed and two-tailed tests – Tests for sampling distribution of means and variances in small and large samples

Module 6: Techniques of multivariate analysis (15 hours)

Nature of multivariate data in economics –Organisation of multivariate data using matrix methods – Techniques of multivariate analysis – (a) Discriminant analysis: Two groups analysis; Fisher's Discriminant Function; Mahalanobis's D^2; Significance testing: Hotelling's R^2 statistic – (b) Canonical correlation analysis: Calculation of correlation matrix; Stewart and Love's Redundancy Measure. (c) Factor analysis and Principal Component Analysis: Components from correlation matrix; Components scores and loadings; Bartlett's Sphericity Test; Factor rotation. (d) Cluster analysis.

Reading list Statistical Methods in Economics

Agresti, Alan., and Finlay, Babara. (2014). Statistical Methods for Social Sciences. Pearson Education Limitted (Essex).

Larsen, Richard J., and Morris L. Marx. (2001). *An Introduction to Mathematical Statistics and its Applications*. Prentice Hall (New Jersey).

Mood, Alexander M., Graybill, Franklin., and Boes, Duane C. (1974). Introduction to the Theory of Statistics. McGraw Hill International Book Company (New Delhi).

Green, Paul E. (1978). Analyzing Multivariate Data. Dryden Press (Michigan).

Course: M.A. in Economics
Semester: II Semester
Title of paper: Agricultural Economics
(Soft Core/Elective)

Credits: 4
Total hours: 60

Objectives

- To analyse the role and importance of agriculture in the growth and development; theories of agricultural growth and development; empirical models of labour productivity and total factor productivity in agriculture; and determination of agricultural prices
- To explain the changes in agriculture sector in global economy with special reference to WTO

Module 1: Nature and scope of agricultural economics (10 Hours)

Definition and scope of agricultural economics - Need for special techniques of economic analysis to deal with unique problems of agricultural economy - Seasonality, perishability and heterogeneity of output – Role of agriculture in economic growth and development - Structural changes and agriculture – Changes in share of agricultural employment and GDP, Organisation of agricultural production – Role of Land, Labour, Capital and entrepreneurship – Farm Management concept and its significance in modern farming.

Module 2: Theory of agricultural growth and development (16 Hours)

Transformation of traditional agriculture – Contribution of Mellor, Dale Jorgenson and Schultz. Models of agricultural location - Backward bending supply curve and Cobweb model – Malthusian and Boserup theories - Inter-sectoral growth models and agriculture – Dual economy models - Fei-Ranis, Arthur Lewis - Leontief's input-ouput model and agriculture; Backward and forward linkages – Construction of Index of Agricultural Production

Module 3: Yield and productivity in agriculture (12 Hours)

Measures of agricultural yield – Productivity, Wages and labour productivity and total factor productivity- Relationship between farm size, yield and productivity - Empirical models of labour productivity and total factor productivity in agriculture

Module 4: Determination of agricultural prices (10 Hours)

Cost of production or input-based approach - Wholesale and retail prices – Risk and uncertainty in agricultural output and prices: Types and measures of instability in agriculture – Need and instruments of price stabilization: Minimum Support Prices and procurements and Buffer Stocks

Module 5: Agriculture and global economy (12 Hours)

Share of agricultural products in global trade – Terms of trade of agriculture products – Competitiveness of agricultural exports - WTO and agriculture; Agreement on Agriculture, issues of subsidies-trade distorting and nontrade distorting subsidies – Globalization of agricultural trade

Reading list Agricultural Economics

Subba Reddy, Raghuram, Neelnkanta Sastry and Bhavani Devi, Agricultural Economics, Oxford & IBH, New Delhi, 2010

Sadhu and Singh, Fundamentals of Agricultural Economics, Himalaya Publishing House, Mumbai, 2017

Bishop and Toussaint, Introduction to Agricultural Economic analysis, John Wiley &Sons, 1958

Goodwin, Charles, Agricultural Economics, Reston, Va. : Reston Pub. Co., 1982

Singh, I.J., Elements of Farm Management Economics, East-West Press Pvt. Ltd, New Delhi. Acharya and Agarwal, Agricultural Marketing in India, Oxford & IBH, New Delhi, 1988

Joseph A McMohan., Melaku Geboye Desta., Research Hand Book on the WTO Agreement on Agriculture: New and Emerging Issues, Edgar Elgar, 2012

R.K. Lekhi & Joginder Singh. Agricultural Economics An Indian Perspective, Kalyani Publishers, 2015

Course: M.A. in Economics
Semester: II Semester
Title of paper: Urban Economics
(Soft Core/Elective)

Credits: 4
Total hours: 60

Objectives

- To equip with theory and measurement of urban economic growth and development, spatial structure of cities and urbanization.
- To familiarize the current policy issues and programmes on urban economic growth, development and urbanization in India.

Module-I: Introduction (10 hours)

Definition and Scope of Urban Economics - Emergence and Growth of Cities, Sources of Urban Growth – Demographic sources: Natural Increase, Net migration, International migration, Trends in growth of urban population in the world- Geographical sources: Urban reclassification and physical expansion of urban boundaries -- Economic sources: Cluster of people and activities -Urbanization and agglomeration economies, industrialization, services sector growth – Estimation of urban GDP- Urbanization and urban economic growth – Urbanization and globalization

Module-II: Economics of Urbanization (10 hours)
The Process of urbanization: Nature and dimensions, factors initiating and perpetuating urbanization process-Characteristics of an economy passing through different stages of urbanization - Classification of urban areas by demographic, geographical and economic criteria- Process of sub-urbanization

Module-III: Theories of Urban Growth (10 hours)
Christaller's Central Place Theory - Urban Economic Base and Urban Growth - The Human Ecological Approach to Urban Growth - City Size and Urban Growth – Linear and Circular cities - Urban Size: Ratchet-Rank Size Rule - The Cost and Benefits of City Size - Optimum City Size - Migration and urban economic growth: Harris-Todaro Model – Urban externalities and growth.

Module-IV: Theories of Urban Spatial Structure (10 hours)
Urban Spatial Structure: Features - Concepts of City Structure - The Minimization of Costs of Friction Hypothesis -Location Equilibrium of an Urban Firm - Retail Establishments - Market Areas – Consumers and Residents - The Concentric Zone Hypothesis - Urban Residential Land Use Models: Alonso, Muth, Siegel, Park Burgess.

Module V Urbanization and Labour Market (8 hours)
Urbanisation and Labour Market Pull and Push Factors for Urbanisation in India, High Wages, Improved Infrastructure, Employment Opportunities, Educational facilities, Growth of formal and Informal economic activities, Labour Force Participation and Distribution of Workers, Street Children and Street Vendors.

Module-VI: Urban Problems and Urban Planning (12 hours)

Over Population and congestion; Urban housing problem and increase in slums; Urban transport and peak load pricing, Urban environment: Air, Water and Noise Pollution; Urban poverty and inequality; Urban Infrastructure: Water Supply, Sanitation and Solid waste management.

Introduction to urban public sector – Composition of urban public sector – Urban local bodies - Sources of revenue and pattern of expenditure of urban local bodies.

Need for Urban Planning; Objectives and Techniques, Review of Existing Methods and Practices - Emerging Planning Process - Strategies and Issues - Comprehensive Development Plan – Master Plan – Jawaharlal Nehru National Urban Renewal Mission - Smart Cities

Reading List

1. Bidyut Mohanty (1993) *Urbanization in Developing Countries Basic Services and Community Participation*, Institute of Social Science, Concept Publishing House
2. Briance A and Ravinder Singh, (edited) (1995) *Housing the Urban Poor, Policy and Practice in Developing Countries*, Sage Publications (New Delhi)
3. Edwin S. Mills. (1987). *Handbook on Regional and Urban Economics, Volume 2: Urban Economics*. North-Holland (Amsterdam)
4. Fred Dure (1971), *The Urban Economy*. London, Index Educational Publishers (London)
5. Harris B. Houdon (1973), *Introduction to Urban Economic Analysis and Policy*. Appleton-Century-Crofts (New York)
6. Harry W Richardson (1972), *Urban Economics, Penguin Group (New York)*.
7. Hirsch W.E. (1973), *Urban Economic Analysis*, McGraw-Hill Book Company (New York).
8. J Vernon Henderson. (1985). *Economic Theory and Cities*. Academic Press (New York)
9. V. Henderson J.F. Thisse. (2004). *Handbook on Regional and Urban Economics, Volume 4: Cities and Geography*. North-Holland (Amsterdam).
10. James Heilbrun (1974), *Urban Economics and Public Policy*. St Martin's Press (New York).
11. Lloyd Rodwin and Associates (1969), *Planning Urban Growth and Regional Development*, MIT Press (Mass).
12. Mark Garrett, (1996), *Transportation Planning*, Sage Publications (New Delhi)
13. Michael P. Todaro and Stephen C. Smith. (2015). *Economic Development*. Pearson (New Delhi). Chapter 7: Urbanisation and Rural-Urban Migration.
14. O' Sullivan (2012), *Urban Economics*, McGraw Hill Higher Education (Boston).
15. Paul Cheshire and Edwin S. Mills. (1999). *Handbook on Regional and Urban Economics, Volume 3: Applied Urban Economics*. North-Holland (Amsterdam).
16. Robert L Bish and Hugh O Nourse (1975), *Urban Economics and Policy Analysis*, McGraw Hill Kogakusha Ltd (Tokyo).
17. Shukla, V (1996) *Urbanization and Economic Growth*, Himalaya Publishers Pvt. Ltd (New Delhi).

Central College Campus, Dr. B. R. Ambedkar Veedhi, Bengaluru – 560 001

SYLLABUS OF M.A. IN ECONOMICS OF III & IV SEMESTERS 2019-20

BENGALURU CENTRAL UNIVERSITY,
CENTRAL COLLEGE CAMPUS,
DR.B.R.AMBEDKAR ROAD,
BENGALURU 560 001.

BENGALURU CENTRAL UNIVERSITY, CENTRAL COLLEGE CAMPUS,
DR.B.R.AMBEDKAR ROAD, BENGALURU 560 001.

THIRD SEMESTER		
III	3.1	Development Economics
III	3.2	International Economics
III	3.3	Econometrics-I
Electives		
III	3.4.1	Industrial Economics
III	3.4.2	Environmental Economics
Open Electives		
III	3.5.1	Globalization and Economy
FOURTH SEMESTER		
IV	4.1	Public Economics
IV	4.2	Econometrics-II
IV	4.3	Project Work
Electives		
IV	4.4.1	Financial Economics
IV	4.4.2	Economics of Infrastructure
IV	4.4.3	Economic Demography
IV	4.4.4	Economics and Law

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Hard Core

Title of the Paper: 3.1: DEVELOPMENT ECONOMICS

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts, structure and current issues in economics of development.
- To acquaint them with the theories of development and growth, their applications, critics and the 'state of art' understanding.

Module I: Development and Underdevelopment (10 Hours)

Concepts of Development and Sustainable Development-Determinants

Measuring Development: conceptual modifications -Income Measures, Basic Needs Approach, PQLI and HDI and Capabilities Approach; Growth and Distributive Justice-Poverty, Inequality and Development: Measurement, Alternative Measures-Impact and Policy options; Development Gap; the inverted U-hypothesis

Module II: Economic Growth (6 Hours)

Factors affecting Economic Growth: capital, labour and technology; Historical Perspective of Economic Growth and its relevance; Structural Diversity and common characteristics of Developing nations

Module III: Theories of Economic Development (16 Hours)

Theories of development – classical theory of development, Karl Marx's theory of development, Schumpeter's theory of innovation, W.W. Rostow's stages of economic development, balanced and unbalanced growth models, Big Push theory.

Theory of Technical Dualism, Myrdal's circular causation, Unlimited supply of labour – Lewis model; Ranis – Fei model, Leibenstein critical minimum effort, Nelson's low-level equilibrium trap, Kremer's O-ring theory of economic development.

Module IV: Growth Models and New Growth Theories (16 Hours)

Harrod and Domar: Instability of equilibrium; Neo Classical Growth Models: Solow and Meade; Growth Models of Joan Robinson, Kaldor and Pasinetti.- Policy Implications

Endogenous Growth Theory: Learning by Doing and Production Function Approach to Development-Total Factor Productivity and Growth Accounting-Role of learning, education and research; Accumulation of Human Capital; Explanation of Cross-Country Differentials in Economic Growth

Module-V: The Political Institutions, State & Performance (12 Hours)
Role of institutions in Economic Development-Changing Roles of State and Market; Neo-liberal state-Issues in Governance-alternative institutional trajectories and their relationship with economic performance; within-country differences in the functioning of state Institutions; state ownership and regulation; Rent seeking and parallel economy government failures and corruption

References: Development Economics

1. Amartya Sen (2000), Development as Freedom, OUP.
2. Debraj Ray. (2009), Development Economics, Oxford University Press, 2009.
3. Higgins, B. (1959), Economic Development, W.W. Norton, New York.
4. Kindleberger, C.P. (1977), Economic Development, (3rd Edition), McGraw Hill, New York.
5. Meier, G.M. (1995), Leading Issues in Economic Development, (6th Edition), Oxford University Press, New Delhi.
6. Myint, H. (1971), Economic Theory and Underdeveloped Countries, Oxford University Press, New York.
7. Partha Dasgupta, (2007), Economics : A Very Short Introduction, Oxford University
8. Pattanaik B.K (2017) Issues and Challenges of Development, Sage Texts, New Delhi Press.
9. Richard Kindle Berger J, C.P, Economic Development, McGraw Hill, New York
10. Srinivasan T.N. Ghatak, S.K. An Introduction to Development Economics, Allen
11. Syed Nawab Haider Naqvi (2015) Economics of Development, Sage Texts, New Delhi
12. Thirwal, A.P. (1999), (6th Edition), Growth and Development, Macmillan, U.K.
13. Todaro, M.P. (1996), (6th Edition), Economic Development, Longman, London.

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Hard Core

Title of the Paper: 3.2: INTERNATIONAL ECONOMICS

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To understand the salient features of New Trade Theories.
- To learn the analytical framework of emergence of protectionism in Global trade
- To acquaint with institutional integration of markets and terms of trade

Module 1: New Trade Theories: Salient Features (15 hours)

Neo-technological trade theories- Kravis theory of Availability, Linder's theory of Volume of Trade and Demand pattern, Posner's Imitation gap, Vernon's Product Cycle Theory.Intra-industry Trade Models- Krugman's Model (1979), Brander-Krugman Model (1983). Empirical work on Intra-industry trade-Strategic Trade Theory Models: Krugman's Model (1984), Brander and Spencer's Model (1985)-Neo –Heckscher –Ohlin Theory, Monopolistic Competition and International trade, Oligopoly and International trade.

Module II: Trade in Services (10 hours)

Emerging pattern of services trade- The scope and potential of Services trade in Developing Countries-GATS.Trade in Factors of Production and in Intermediate Good- Capital inflow and welfare- Emigration versus capital inflow- Fragmentation, Outsourcing and trade. Traded vs non-traded goods.

Module III: New Protectionism (10 hours)

The political economy of protectionism-Non-tariff barriers- Voluntary Export restraints and Import Expansion- Subsidies, Administered and Contingent Protection and fair trade: Dumping and Antidumping- Countervailing duty, Safeguard actions-Neo Protectionism.

Module IV: Economic Integration (10 hours)

Types of integration-Customs union: Partial and general equilibrium analysis-Trade creation and Trade diversion-Free trade areas, Emerging issues in SAFTA, ASEAN and EU.

Module V: Trade and Development. (15 hours)

Terms of Trade and UDCs - Theory of Immiserising growth-Dutch disease-Rybenzynski theorem – Technical progress and trade- Structural changes in trade and Economic development - Global and National scenario.

References: International Economics.

1. Bhagwati,N, Panagariya, A. and T.N. Srinivasan.(1998). Lectures on International Trade, MITPress, 1998.

2. Brander James & Krugman Paul (1983)- "A Reciprocal Dumping Model of International Trade "– Journal Of International Economics, Vol. 16, Nos. 3 – 4, pp. 313 – 321.

3. Brander James & Spencer Barbara (1985) – "Export subsidy and International Market share rivalry"– Journal of International Economics, Vol. 18, Nos. 1 – 2, pp. 83 – 100.

4. Brander James (1981) –" Intra-Industry Trade in Identical Commodities" – Journal of International Economics, Vol. 11, No. 1, pp. 1 – 14.

5. Dixit A. K. & Stiglitz J. (1977) – "Monopolistic competition & Optimum Product Variety" – American Economic Review, Vol. 67, No. 3, pp. 297 -308. Economic Studies, Vol. 9, No. 1, pp. 58 -73.

6. Feenstra Robert C (2004), Advanced International Trade- Theory and Evidence, Princeton University Press, Princeton.

7. Grubel H. & Lloyd P. (1975) – Intra – Industry Trade: The Theory and Measurement of International Trade in Differentiated Products- London, Macmillan.

8. Kierzkowski (Ed) - Monopolistic Competition and International Trade – Oxford, Oxford University Press.

9. Kravis I. B. (1956) – "Availability & Other Influences on the Commodities Composition of Trade"– Journal of Political Economy, Vol. LXIV, April, pp. 143 – 155.

10. Krugman P R and Obsfeild M (2009) - International Economics- Theory and Policy, (8th Edition) Pearson, Dorling Kindersley (India) Pvt. Ltd, New Delhi

11. Krugman Paul R. &Obstfeld Maurice (2000) – International Economics – Theory & Policy - New Delhi, Addison –Wesley Longman, pp. 138 – 140.

12. Krugman Paul R. (1979) – "Increasing Returns, Monopolistic Competition and International Trade "– Journal of International Economics, Vol. 9, No. 4, pp. 469 - 479.

13. Krugman Paul R. (1984) – "Import Promotion as Export Promotion" in – Henry Kierzkowski (Ed) - Monopolistic Competition and International Trade – Oxford, Oxford

14. University Press.Rivera-Batiz.L. and M. Olivin.(2003). International Trade: Theory, Strategies and Evidence, Ch.3, Oxford University Press.

15. Linder S B (1961) – An Essay on Trade & Transformation - New York, John Wiley.

16. Oliver Cattaneo, (2010). International Trade in Services. New Trends and Opportunities for Developing Countries, World Bank, Washington DC.

17. Posner M. V. (1961) – "International trade & Technical change" – Oxford Economic Princeton University Press, Princeton.

18. Salvatore, D (2008) - International Economics, (8th Edition). Wiley India, New Delhi, share rivalry"– Journal of International Economics, Vol. 18, Nos. 1 – 2, pp. 83 – 100.

19. Stolper W. F. & Samuelson P. A. (1941) – "Protection & Real Wages" – Review of Economic Studies, Vol. 9, No. 1, pp. 58 -73.

20. Vernon R. (1966) – "International Investment & International Trade in the Product Cycle" - Quarterly Journal of Economics, Vol. 80, No. 2, pp. 190 – 207.

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Elective

Title of the Paper: 3.4.1 Industrial Economics

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts such as productivity, efficiency, capacity utilization
- To acquaint them with the theories and evidence of Product pricing
- To know the industrial development of India

Module I: Frame work of Industrial Economics (8 Hours)

Framework of industrial economics – conceptual framework, history and scope of industrial economics, concept of firm and organisation of a firm – ownership, control and objectives of the firm. Location theories – Weber and Sargent Florence.

Module- II: Market Structure (12 hours)

Market structure – standard forms of market structure, market concentration; product differentiation; entry conditions; economics of scale; market structure and profitability of market structure; growth of the firm – main determinants.

Module III: Market Conduct (10 hours)

Product pricing — Theories and evidence; Investment expenditure — Methods of evaluating Investment expenditure; Theories and empirical evidence on Mergers and acquisitions (M & As) and diversification.

Module IV: Market Performance (10 hours)

Growth of the firm — Size and growth of a firm; Growth and profitability of the firm; Constraints on growth; Productivity, efficiency and capacity utilization — Concept and measurement, Indian situation.

Module V: Indian Industrial Growth and Pattern (12 hours)

Classification of industries; Industrial policy in India — Role of Public and private sectors; Recent trends in Indian industrial growth, MNCs and transfer of technology; Liberalization and privatization;
Regional industrial growth in India; Industrial economic concentration and remedial measures; Issues in industrial proliferation and environmental preservation; Pollution control policies.

Module VI: Industrial Labour (8 Hours)

Structure of industrial labour; Employment dimensions of Indian industry; Industrial legislation; Industrial relations; Exit policy and social security. Wages and problem of bonus — labour market reforms

References:

1. Ahluwallia, I.J (1985), Industrial Growth in India, Oxford University Press, New Delhi.
2. Barthwal, R.R. (1985), Industrial Economics, Wiley Eastern Ltd. New Delhi
3. Cherumlam, F. (1994), Industrial Economics, Himalaya Publishing House, Mumbai
4. Desai, B.(1999), Industrial Economy in India, Himalaya Publishing House, Mumbai
5. Divine, P.J and Jones. R.M. et.al, (1976), An Introduction to Industrial Economics, George Allen & Unwin & R.M. Jones Ltd. London.
6. Kuchal, S.C.(1980), Industrial Economy of India, Chaitanya Publishing House, Allahabad
7. Martin, S, Advanced industrial Economics, Oxford University Press, New Delhi
8. Mookherjee, D Indian industry policies and performance, Sage Publications, New Delhi
9. Sandesara, J.C. (1992), Industrial policy and planning – 1947 - 1991: Tendencies, Interpretations and issues, Sage Publications, New Delhi

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Elective

Title of the Paper: 3.4.2 Environmental Economics

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts of Environment Economics and its importance in welfare
- To acquaint them with the theories of environmental policy
- To understand the Environmental and Natural Resource Problems in India

Module – I: Welfare Economics and Environment (10 hours)

Welfare economics and Environment; Pareto optimality and competitive equilibrium: Fundamental theorems of welfare economics. Externalities and market inefficiency. Economic activity and environment quality – interactions and tradeoffs; Roots of environmental degradation – consumers and producers surplus. Market and government failure and environment degradation

Module – II: Measurements of environmental values (16 hours)

Measurements of environmental values – use values; option values and non- use values; valuation methods – methods based on observed market behaviour; hedonic property values and household production models (travel cost method and household health production function. Methods based on response to hypothetical markets, contingent valuation methods.

Module – III: The Theory of Environmental Policy (14 Hours)

Environmental externalities — Pigouvian taxes and subsidies, marketable pollution permits and mixed instruments (the charges and standards approach). Coase's bargaining solution and collective action; Informal regulation and the new model of pollution control, Monitoring and enforcement of environmental regulation, Environmental institutions and grass root movements; Global environmental externalities and climatic change — Tradable pollution permits and international carbon tax, Trade and environment in WTO regime.

Module IV: Economics of Natural Resource Management and Sustainable Development (10 Hours)

Theories of optimal use of exhaustible and renewable resources; Environmental and development trade off and the concept of sustainable development; Integrated environmental and economic accounting and the measurement of environmentally corrected GDP; Macroeconomic policies and environment.

Module V: Environmental and Natural Resource Problems in India (10 Hours)

Mechanism for environment regulation in India; Environmental laws and their implementation; Policy instruments for controlling water and air pollution and forestry policy; People's participation in the management of common and forest lands; The institutions of joint forest management and the joint protected area management; Social forestry — rationale and benefits.

References: Environmental Economics.

1. Baumol, W. J (1998), The theory of environmental policy, Cambridge University Press, & W.E. Oates Cambridge
2. Bromely, D.W (Ed) Handbook of Environmental Economics, Blackwell, London
3. Hussen, A.M (2004), principles of environmental economics, Routlege, London
4. Kolstad, C.D (2006), Environmental Economics, Oxford University Press, New Delhi
5. Sankar, U (Ed) Environmental Economics, Oxford University Press, New Delhi
6. Crones, R (1996), The theory of externalities and public goods, Cambridge University T. Sandler Press, Cambridge
7. Katar Singh, Anil Shishodia (2007) Environmental Economics, Sage Texts, New Delhi

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Open Elective

Title of the Paper: 3.5.1 Globalization & Economy

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts, structure and advantages and disadvantages of Globalisation
- To acquaint them with the different forms of international financial flows.
- to make them know the impact of global crisis on Indian Economy and the lessons India can learn from it

Module I: Introduction to Globalisation (12 hours)

Concept and definition – Evolution – objectives – reasons for globalisation process , dimensions and features –measuring the extent of globalisation – Advantages and disadvantages – gainers and losers of globalisation.

Module II International Financial Flows (16 hours)

Foreign Direct Investment, its composition, direction and trends – factors determining FDI, - Benefits and costs – MNCs as means of global capital flows – portfolio investment – Official Development Assistance- Remittances from abroad-International Commercial borrowings

Module III: Global Crisis (16 hours)

Global Crisis- Meaning, Features, Causes- Structural causes, Types; Understanding the Global Financial Crisis,

The crisis of capital, labour, the crisis of distribution

Global melt down & the subprime crisis

Module IV: Impact of Global Crisis on Indian Economy (16 hours)

Global Financial Crisis and the Indian economy- Impact on Macro Economic Indicators- Growth rate, Investments, Trade and Capital account, Impact on various sectors- Manufacturing, Services- Banking , Impact on Various sections of society-Poor, Middle and Rich Class; Strategies and steps to reduce another Global financial crisis, Lessons for India from Global financial crisis of 2008

References:

1. Bhagawathi Jagadish (2004) In Defence of Globalisation, Oxford University Press New Delhi.

2. Clayton, Thomas. (2004). "Competing Conceptions of Globalization" Revisited: Relocating the Tension between World-Systems Analysis and Globalization Analysis. In: Comparative Education Review, vol. 48, no. 3,

3. Friedman, Milton (1993). "The Case for Free Trade", Hoover Digest. 1997 (4): 42. Bibcode:1993SciAm.269e..42B. doi:10.1038/scientificamericanl193-42. Archived from the original on 22 January 2007.

4. Global Economic & Financial Crisis; Economic & Political Weekly, Orient Blackswanan Pvt, Ltd. Hyderabad 500 013, 2009, pp 1to 368+viii.

5. Goldin Ian and Kenneth Reinert (2006), Globalisation for Development, World Bank and Palgrave Macmillan, Washington DC

6. Keat.P.G.,.Young.P.K.Y & S.Banerjee: Managerial Economics-Economic Tools for Today's Decision Makers; Pearson Education, New Delhi 110 017,2012,Second Impression

7. Petras James and Henry Vitmeyer (2001). Globalisation Unmasked, Madhyam books Delhi.

8. Rajiv Kumar, Bibek Debroy, Jayati Ghosh, Vijay Mahajan K., Seeta Prabhu (2009) Global Financial Crisis: Impact on India's Poor Some Initial Perspectives, United Nations Development Programme (UNDP) India

9. Singh Karlijt: (1998) Globalisation of Finance Madhyam books New Delhi.

10. Stiglitz Joseph. E (2002) Globalisation and its Discontents- W.W. Norton and company New York

11. Yusuf Shahid, Simon Everett and Weiping W.U. (ed)(2001) Facets of Globalisation: International and Local Dimensions of Development, The World Bank, Washington DC

Course: M.A. in Economics

Semester: IV Semester

Type of the Course: Hard Core

Title of the Paper: 4.1 PUBLIC ECONOMICS

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To enable students to understand regulatory and developmental responsibilities of the government and the changes there in
- To enumerate the theoretical and empirical dimensions of public goods and public choice, fiscal instruments
- To understand the fiscal federalism with special reference to Indian context & to understand the fiscal management issues of India.

Module I: Role of Government (10 hours)

Role of State- a historical evolution, Economic rationale of the Modern State; Market Failure and the Rationale for Government Intervention; Natural Monopolies; Asymmetric Information; The Problem of Externalities and their Internalization - Government failure.

Module II: Theory of Public Goods and Public Choice (12 hours)

Concepts, Characteristics of Public Goods: Economic analysis of Public Goods, Efficient Provision of public good; Partial Equilibrium Analysis, Optimal Provision of Public Good; General Equilibrium Analysis. Merit goods, Impure Public Goods and The Theory of Clubs; Buchanan Model-Tiebout Model, Common property Resources; Tragedy of the commons. Public Choice theory: Problem of Collective Choice Defined, Majority Voting, An economic Theory of politics.

Module III: Fiscal Policy Instruments (15 hours)

Fiscal policy for Stabilization; Classical and Keynesian - Principles of Taxation: Benefit and ability to pay approaches; Theory of Tax Incidence; Theory of optimal Taxation: Trade-off between equity and efficiency; Theory and measurement of dead weight losses- The Problem of Double Taxation. Theoretical and Empirical Analysis of Public Expenditure; Pure Theories of Public Expenditure, Positive, applied and normative aspects of public expenditure- Wagner and Wiseman Peacock Hypothesis and their current relevance, Criteria of public Investment; Social cost- benefit analysis- Public Expenditure Management & Control: Concepts. Theories of Public debt: classical and Compensatory views; Sources of Public debt; Burden of Public Debt; Principles of Management and Repayment.- Intergenerational issues and debt sustainability

Module IV: Fiscal Federalism: Theory and Practice (10 hours)

Principles of Federal (Multi Unit) Finance; Imbalances in Federal Finance; Vertical and horizontal imbalance; Fiscal federalism in India: Transfer mechanisms- Finance Commissions and their impacts, Constitutional Assignment of State - Local finance in India:

Issues in Fiscal Decentralisation in India in the context of 73rd and 74th constitutional amendments, State Finance Commissions

Module V: Indian Public Finance: Current Scenario (13 hours)

Public budgeting- concepts, principles, practices and reforms, Debates on Fiscal Consolidation and policy measures in India: Revenue, Fiscal and Primary Deficits; Fiscal Responsibility and Budget Management Act- Budget Analysis.

Indian Tax System: An Assessment; Tax and non- Tax Revenue of the Union, States and local bodies; VAT, CENVAT, Design and implementation of Goods and Services Tax (GST), Tax administration and implementation Issues in Tax reforms in India. - Structure, Trends and Pattern of Public Expenditure in India- Public debt in India: liabilities, Growth and Problem

References: Public Economics

1. Alan J. Auerbach and Martin Feldstein, (1985 & 1987) Handbook of Public Economics, Vol. 1 & 2, Elsevier, Amsterdam, North Holland.
2. David N. Hyman: Public Finance: A Contemporary Application of Theory to Policy, 8th Edition, (2005) Cengage Learning.
3. Dennis C. Mueller, (2003) "The size of government", In Public Choice III, Cambridge, University Press, Cambridge.
4. Francesco Forte (2011) Principles of Public Economics a Public Choice Approach,
5. Gayithri, K (ed) 2018, Public Budgeting in India: Principles and Practices, Springer, New Delhi
6. Government of India- Comptroller and Auditor General- Reports on Union and State Finances- Annual Issues
7. Government of India- Economic Survey- Annual Issues
8. Government of India- RBI State Finances- Annual Issues
9. Hindriks J and Myles GD. (2006), Intermediate Public Economics, Prentice Hall of India, Ltd. New Delhi.
10. Joaquim Silvestre (2013) Public Microeconomics Efficiency and Equity in Public Policy, University of California, Davis, US.
11. Jonathan Gruber, (2009) "Public Goods", In Public Finance and Public Policy, Worth, Publishers, Chapter- 7.
12. Joseph E. Stieglitz, (2010), Economics of Public Sector, W.W. Norton & Company.
13. Reddy, Y.V and G.R Reddy, (2019) Indian Fiscal Federalism, Oxford
14. Rosen, Harvey: Public Finance, McGraw Hill, (2013) New York.
15. Santra (2016) India Public Finance and Policy Report 2016: Fiscal Issues and Macro Economy, Oxford. 11.

Course: M.A. in Economics

Semester: IV Semester

Type of the Course: Hard Core

Title of the Paper: 4.2 Econometrics - II

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To enable students to further acquire knowledge of advanced econometrics
- To acquaint students in methods relating to both single equation and simultaneous equation
- To enable students to learn the applications of econometrics

Module I: Special problem in Single Equation Regression Model (14 Hours)

Errors in variables - Method of instrumental variables - Distributed-lag models: specification, estimation and causality – Dummy variables - Limited dependent variables - LPM, Logit, Probit and Tobit models ; Generalised, restricted and non-linear least squares estimations

Module II: Time Series Analysis (12 Hours)

Time Series Data: Nature, Examples, Functional Forms, Trends and Seasonality, Stationary and Unit Root Test, approaches to economic forecasting, AR, MA, ARIMA.

Module III: Introduction to Panel Data (10 Hours)

Simple Panel Data Methods - Pooling independent cross sections across time - Policy analysis with pooled cross sections - Two period panel data analysis. Estimation of Panel data – random effects approach and fixed effects approach.

Module IV : Simultaneous Equation Approach (14 Hours)

Simultaneous equations model - Example - Identification problems: under, exact and over tests of simultaneity and order erogeneity - Methods of estimation - ILS, 2SLS, LIML, K-Class Estimators, Simulation and Monte- Carlo Studies

Module V: Application of Econometrics (10 Hours)

Demand-Supply, Keynesian income determination, wage-price, Recursive and IS-LM Models, etc

Econometrics – II . (5 Copies)

References:

1. Koutsoyiannis.A. (2004). Theory of Econometrics, Palgrave, 175, Fifth Avenue, New York, N.Y. second edition
2. Gujarathi.D. (2005) Basic Econometrics; Tata-McGraw-Hill Edition, 2004, Third Reprint 2005, New Delhi
3. Dawn C Porter, Sangetha Gunasekar and Gujarati, D.N: Basic Econometrics, 5th edition, Tata McGraw.
4. Hayashi.F. (2006) Econometrics, Princeton University Press/New Age Publishers,New Delhi, 2006,
5. Maddala, G.S. Kajal Lahiri: Introduction to Econometrics, 4th Edition, Wiley Publication.
6. J.Johnston & J.DiNardo(1997). Econometric Methods; The Tata McGraw-Hill Companies Inc.International Edition.
7. J.Y.Campbell,A.W.Lo&A.GraigMacKinlay(2006), The Econometrics of Financial Markets,New Age International Publishers,New Delhi.
8. Johnston, J. and J. Dinardo(1972) Econometric Methods, Fourth Edition, McGraw-Hill, latest edition.
9. Jonston, J. (1971), Econometric Methods, McGraw-Hill.
10. Klein, L.R (1974), A Text Book of Econometrics, Prentice Hall, Englewood Cliffs, NJ
11. Klein, L.R. (1965), An Introduction to Econometrics, Prentice Hall, Englewood Cliffs, NJ
12. Nachane (2006) Econometrics: Theoretical Foundations and Empirical Perspectives, Oxford University Press, New Delhi
13. Theil, H. (1978), Introduction to Econometrics. Prentice-Hall
14. LotLW.F. & Subhash C.Ray (1992) Applied Econometrics: Problems with Data Sets; TheDrdenPress, Nee Tork
15. Grene.W.H. (2007), Econometric Analysis; Pearson Education Inc. New Delhi 110 092,Second Impression,
16. William H. Greene: Econometric Analysis (7th Edition), Pearson Education India.
17. Wooldridge, J.M. (2000): Introductory Econometrics: A Modern Approach, Southwestern College Publications.

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Hard Core

Title of the Paper: 4.3: PROJECT WORK

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To introduce students to real life situations in any human activity;
- To enable students to identify problems in any domain in Economics;
- To facilitate students to find solutions in the back ground of knowledge acquired from learning from the three semesters &
- To prepare students for skills in problem solving in the application areas in Economics.

Note:

As per BCU Regulations for Arts

10.1 The project work must be guided by teachers with research experience.

10.2 The project work will be carried out in the fourth semester, but the guide allocation and topics will be finalized in the third semester

10.3 The topics assigned by the respective guides for the project work shall be approved by the department council in third semester.

10.4 The project work dissertation will evaluated for 70 Marks and there will be viva for 30 Marks.

10.5 The Viva will be conducted by the concerned BOE in the presence of the guide.

10.6 Project may also include field work/internship. The modalities can be worked out by the concerned teacher with the approval of department council

The Concerned Guides are requested to see that the

1. The final project must pass through test of plagiarism/similarity test by an accepted software eg.,Turnitin or Urkund or any other standard software.

2. The similarity index should not exceed 20%.

3 The text of the project work must have a certificate of originality by the Guide/Supervisor.

INDICATIVE GUIDELINES

1. Prepare a check list for identifying a theme for the project. This can be done as a part general discussion in the third semester of the M.A. programme. The student may be allowed to choose his theme either in a concept area or in an application area. Live project may be encouraged to make student feel the problem, describe it & document in the language of research.

2. Conduct a pilot study/survey if necessary.

3. A note on significance/importance of the Study could be added.

4. Allow the student to use search engine for a broad Review of Literature.

5. Mark out Research Gap.

6. Formulate of Research Questions /Issues/Problem.

7. List out Research Objectives

8. List Hypotheses for testing to draw conclusions (Optional).

9. Advise the student to develop a Theoretical construct (Optional for PG).

10. Develop Conceptual Framework – Conceptualization & Operationalization (precise and specific meaning of the terms/operational definitions / concepts /variables).

11. Enumerate Coverage (Universe/ Sample & period of study).

12. Evaluate secondary source(s) of problem identified.

13. Detail Data source (Primary/Secondary/online)

14. Choice of Tools of analysis (Analytical Framework) need be enumerated.

15. The Social Relevance of the study with stress on immediacy or on implications may stated.

16. Help draw limitations of the study.

17. Implications of the Study for a lead solution be highlighted.

18. Appendices

19. Bibliography

20. References

21. Webliography

Indicative outlines of the Project Report

A. Title Page/ Cover Page
a. Title page
b. Title of the project
c. Name of the candidate/candidate code
d. Degree for which project is submitted.
e. Name of the college/ Department and University
f. Month and year the project is presented

B. Declaration of the student

C. Certificate of Originality based on Similarity Index Report

D. Acknowledgments

E. Table of contents

a. List of Tables
b. List of Figures
c. Glossary
d. List of abbreviations

F. Chapter Outlines (Chapter Titles and Page Numbers)

G. Abstract/ Executive Summary (Not exceeding two pages)

H. The Main Text

a. Introductory Chapter: to cover 2 to 14 points mentioned above
b. Other Chapters - Analysis, Results Interpretation
c. Conclusion Chapter: Conclusions, Recommendations & Summary
I. End Notes (after each Chapter)
J. Bibliography (at the end of the thesis)

K. Appendices/Annexure

a. Check list
b. Questionnaire
c. Interview Schedule
d. Observation Schedule (optional)
e. Coding Frame (optional)
f. Letters sent to sample members, if any
g. First two pages of Originality Report Attested by the Student & the Guide/Supervisor
h. Any Other

Length of the Project

1. Report length, minimum of 35 pages, excluding Appendix and Certificates.
2. Alignment: Justify
3. Font: Times New roman
4. Font size: 12
5. Line spacing: 1.5
6. No Page Border

Course: M.A. in Economics

Semester: III Semester

Type of the Course: Elective

Title of the Paper: 4.4.1: FINANCIAL ECONOMICS

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts of Financial Economics
- To acquaint the students with the theory of Uncertainty and Mean Variance Portfolio Theory and Index Models
- To learn about fixed income Securities

Module I: Introduction to Financial Markets (12 hours)

Capital markets, consumption and investments with and without capital markets, market places and transaction costs and the breakdown of separation; Fisher separation theorem; the agency problem; maximization of shareholder's wealth

Module II: Theory of Uncertainty: (14 hours)

Axioms of choice under uncertainty; utility functions; expected utility theorem; certainty equivalence, measures of risk-absolute and relative risk aversions; stochastic dominance-first order, second order and third order; measures of investment risk-variance of return, semi-variance of return, shortfall probabilities,

Module III: Mean-Variance Portfolio Theory (12 hours)

Measuring portfolio return and risks, effect of diversification, minimum variance portfolio, perfectly correlated assets, minimum variance opportunity set, optimal portfolio choice; mean variance frontier of risky and risk-free asset, portfolio weights

Module IV: Index Models, CAPM & APT (12 hours)

Models of asset returns, multi index models, single index model, systematic and specific risk, equilibrium models-capital asset pricing model, capital market line, security market line, estimation of beta., arbitrage pricing theory

Module V: Fixed Income Securities (10 hours)

Bond prices, spot prices, discount factors, and arbitrage, forward rates and yield-to-maturity, Price sensitivity, Hedging

References:

1. Brealey, R. and S. Myers, (1997),Principles of Corporate Finance, fifth edition, New York, McGraw Hill.
2. Copeland, T. E. and J. F. Weston, (1992), Financial Theory and Corporate Policy, Addison Wesley
3. Elton, E.J and M J. Gruber (1991), Modern Portfolio Theory & Investment Analysis, (fourth edition) John Wiley & Sons
4. Houthakker, H.S. and P.J. Williamson, (1996), Economics of Financial Markets, Oxford University Press.
5. Kishore, R.M.(2004), Financial Management, Taxman Allied Services
6. Pandey, I.M.(2015) , Financial Management, Vikas Publishing House, New Delhi
7. Ross, Waster Field (2008), Fundamentals of Corporate Finance, Tata McGraw Hill Education.

Course: M.A. in Economics

Semester: IV Semester

Type of the Course: Elective

Title of the Paper: 4.4.2 Economics of Infrastructure

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts of Economics of Infrastructure
- To acquaint wholly to issues involved in development of infrastructure
- To understand the primacy of transport, communication, energy, education and health in the development of the country

Module– I: Introduction to Economics of Infrastructure (12 hours)

Infrastructure and economic development – infrastructure as a public good; Social and physical infrastructure; Special characteristics of public utilities; The peak – load, off – load problem, dual principle controversy; economies of scale of joint supply; marginal cost pricing vs. other methods of pricing in public utilities; cross – subsidization – free prices, equity and efficiency.

Module– II: Transport Economics (10 hours)

The structure of transport costs and location of economic activities. Demand for transport, Models of freight and passenger demand. Model choice; cost functions in the transport sector. Pricing principle, Special problems of individual models of transport

Module – III : Communications (10 hours)

Rate- making in telephone utilities Principles of decreasing costs in telephone industry, Characteristics of postal services, Criteria for fixation of postal rates. Measurement of standards of service in telephone and postal services.

Module– IV: Energy Economics (12 hours)

Primacy of energy in the process of economic development, Factors determining energy demand, Effects of energy shortages, Energy conservation, Renewable and non- conventional sources of energy; Energy modelling; The search for an optimal energy policy in the Indian context.

Module – V: Social infrastructure (16 hours)

Organization and financing of supply of social services. Private vs. Public Sector Financing; Recent debate about the fixation of pricing of social services.

Education and Economic Growth. Approaches to Educational Planning. Social Demand. Rate of Return and Manpower Balance Approaches. The Case for Universal, Free, Primary

Education; Structure of higher education and problems of its financing in India; The issues in education policy

Health dimensions of development; Determinants of Health — poverty, malnutrition, illiteracy and lack of information; Economic dimensions of health care — Demand and supply of health care; Financing of health care and resource constraints

References:

1. Crew. M.A and P.R.Kleindorfer (1979), Public Utility Economics, Macmillan, london.
2. Faris, M.T & R.Sampson (1975), Public Utilities, Houghton Miffin, Boston
3. Goyal, S.K (Ed.). (1985), Public Enterprises, Indian Institute of Public Administration, New Delhi
4. Indian Council of Social Sciences Research (ICSSR) (1976), Economics of Infrastructure, Vol. VI, New Delhi
5. Kneafsey, J.T (1975), Transportation Economic Analysis, Lexington, Toronto
6. Munty, D (Ed). (1968) Transport: Selected Readings, Penguin, Harmonds Worth
7. National Council of Applied Economic Research (NCAER) (1996), India Infrastructure Report : Policy Implications for Growth and Welfare, NCAER, New Delhi.
8. New Crew, M.A. and P.R. Kleindorfer (1979), Public Utility Economics, Macmillan, London.
9. Kleindorfer P.R, (1976) Economics of Infrastructure ICSSR Vol. VI, New Delhi
10. Pachauri, R.K (Ed) (1980), Energy Policy for India, Macmillan Co of India, New Delhi
11. Parikh, K.S. (Ed.) (1999), India Development Report – 1999-2000, Oxford, New Delhi.
12. Sampson.R., Asonofsky, J.A, Rao, M. Shakeen (Eds) : Energy Policy, North Holland, Amsterdam.
13. Urvey, R. (Ed.) (1968), Public Enterprises, Penguin, Harmonds worth.
14. Welson, J.R. Marginal Cost Pricing in Practice. Prentice Hall

Course: M.A. in Economics

Semester: IV Semester

Type of the Course: Elective

Title of the Paper: 4.4.3 Economic Demography

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts of Economic Demography
- To acquaint the students with quantitative and the qualitative aspects and characteristics of the population through various demographic techniques
- To understand the dynamics of Migration and Urbanisation.

Module 1: Population and Development (10 hours)

Meaning and scope of demography; Components of population growth and their inter-dependence; Measures of population change; Structure, distribution and sources of population data; Theories of population — Malthus, Optimum theory of population; Theory of demographic transition —Views of Medows, Enke and Simon; Population and development

Module – II : Structure of Population (12 hours)

Population trends in the 20th century. International aspects of population growth and distribution, population and environment. Pattern of age and sex structure in developed and developing countries. Determinants of age and sex structure; demographic effects of sex and age structure, economic and social implications. Age pyramids and projections.

Module – III: Fertility, Nuptiality and Mortality (12 hours)

Fertility – basic measures, TFR, GRR, NRR; levels, trends and determinants; Nuptiality — Concept and analysis of marital status, single mean age at marriage; Synthetic cohort methods; Trends in age at marriage; Mortality
— Death rates, crude and age-specific; IMR, MMR, levels, trends and determinants; life tables – construction and uses: concept of stable population projection.

Module – IV: Migration and Urbanization (12 hours)

Concept and types — Temporary, internal and international; International migration — its effect on population growth and pattern; Factors affecting migration; Theories of migration related to internal migration; Urbanization — Growth and distribution of rural-urban population in developed and developing countries.

Module – V Population Policy in India (14 hours)

Evolution of population policy in India — the shift in policy from population control to family welfare, to women empowerment; Family planning strategies and their outcomes; Reproductive health, maternal nutrition and child health policies; Population and strategies for human development of different social groups; Social impact of new reproductive technologies and their regulation; The population policy 2000; UN World Population Prospects (revision 2015) and estimated population of India

References:

1. Agarwala S.N. (1972), India's Population Problem, Tata McGraw-Hill Co., Bombay.
2. Bogue, D.J. (1971), Principles of Demography, John Wiley, New York
3. Bose, A. (1996), India's Basic Demographic Statistics, B.R. Publishing Corporation, New Delhi
4. Chenery H. and T.N. Srinivasan (Eds.) (1989), Hand Book of Development Economics, Vol 1 & 2 Elsevier, Amsterdam.
5. Choubey, P.K. (2000), Population Policy in India, Kanishka Publications, New Delhi.
6. Coale A.J. and E.M. Hoover (1958), Population Growth and Economic Development in Low Income Countries: A Case Study of India's Prospects, Princeton University Press, Princeton.
7. Gulati, S.C. (1988), Fertility in India: An Econometric Study of a Metropolis, Sage, New Delhi.
8. Mishra, S, Voluntary Action in Health and Population, Sage, New Delhi
9. Novell, C. Methods and Models in Demography, Bellhaven Press, London
10. Simon, J. L Population & Development in poor countries, Princeton University Press
11. Srinivasan, K. Basic Demographic Techniques and Application, Sage, New Delhi

Course: M.A. in Economics

Semester: IV Semester

Type of the Course: Elective

Title of the Paper: 4.4.4 Economics and Law

Credits: 4 **Duration: 60 hours**

The Objectives set for the course are:

- To familiarize the students with the concepts of Economics and Law
- To acquaint the students to comprehend the basic economic issues affecting the economy along with the related legal provision
- To understand the consequences of legal rules, primarily as an exercise in applied microeconomics, macroeconomics, industrial and international economics

Module I: Method of Law and Economics (12 hours)

Economic Analysis of Law. Why lawyers study economics and economists study law, Law in L&E and Economics in L&E, Positive and normative approach of L&E, Criteria for analyzing legal and economic issues – Efficiency criteria – Pareto, Kaldor-Hicks and Nash Equilibrium, Fairness Criteria – Markets and efficiency and Market failure – Coase Theorem –Civil Law and Common Law traditions – Indian Court Structure – Nature of legal disputes, evolution of legal rules

Module II: Economic Analysis of Property Rights (12 hours)

The Nature and Function of Property Rights: the definition – emergence – incentives enforcement of property rights – Property Law and Coase Theorem – Normative Coase and Hobbes Theorem - Acquisition and Transfer of Property – Limited and Divided Ownership – Public Property – Eminent domain and regulation of property

Module III: Economic Analysis of Contract and Consumers (12 hours)

Complete and Incomplete Contracts: Bargaining theory – Economic Theory of Contract - Remedies as Incentives - The Elements of Valid and Invalid Contracts, Contracts and Efficient, Exchange – Performance of Contract and Breach – Duress - mutual assent – Fraud Mistake –Disclosure - Efficient Breach Model – Specific Performance, Self-Enforcement of Contracts

Module IV: Economic Analysis of Crime and Punishment (12 hours)

Distinguishing Crimes and Torts - Property Rules, Liability Rules, and Criminal Sanctions, The Economic Model of Crime - The Offender's Decision to Commit a Crime and the Supply of Offenses, Does punishment deter crime - Optimal Punishment, The Optimal Fine, Gain Versus Harm-Based Fines, Fines and Imprisonment, Economics of the Death Penalty, Constitutional Issues, The Bail System, Private Protection, Plea Bargaining

Module V: Legal Structures of Business and Economic Organizations (12 hours)

Corporations as Legal Entity – Governance of Capital, Shares, Debentures through Law – Legal Structure of Economic Institutions: RBI, IRD, MRTP, Competition Commission, SEBI –Rules of Merging and Acquisition – Distributive Justice under Property, Contract and Liability –Efficiency and Equity Principal for Taxation Law – Centre State Relations and Legality for Efficiency – Trade Agreements : WTO, GATT, TRIPS AND TRIMS, FEMA. Regional Trade Agreements

References:

1. Becker, Gary (1968) "Crime and Punishment: An Economics Analysis," Journal of Political Economy, Vol. 76,

2. Brown, John (1973) "Toward an Economic Theory of Liability," Journal of Legal Studies, Vol. 2, pp. 323-349.

3. Calabresi, Guido (1961) Some Thoughts on Risk Distribution and the Law of Torts, The YaleLaw Journal, 70, 4,

4. Calabresi, Guido, and A. Douglas Melamed (1972) "Property Rules, Liability Rules, and Inalienability: One View of the Cathedral," Harvard Law Review, Vol. 85: 1089-1128.

5. Coase, Ronald (1960) "The Problem of Social Cost," Journal of Law and Economics, Vol. 3, pp. 1-44.

6. Coleman, Jules (1980) "Efficiency, Utility, and Wealth Maximization." Hofstra Law Review 8(3): 509-51.

7. Cooter, Robert (1985) "Unity in Torts, Contracts, and Property: The Model of Precaution,"California Law Review, Vol. 73,

8. Cooter, Robert and Daniel L. Rubinfeld (1989) "Economic Analysis of Legal Disputes and Their Resolution," Journal of Economic Literature, Vol. 27, pp. 1067-1097.

9. Demsetz, Harold (1967) "Toward a Theory of Property Rights," American Economic Review,Vol. 57, pp. 347-359.

10. Donohue, John J. III and Steven D. Levitt (2001) "Legalized Abortion and Crime," Quarterly Journal of Economics 116(2): 379-420.

11. Dworkin, Ronald (1980) "Why Efficiency: A Response to Professors Calabresi and Posner,"Hofstra Law Review 8(3): 563-90.

12. Farmer, Amy and Dek Terrell (2001) "Crime versus Justice: Is There a Trade-off?" The Journal of Law and Economics, Vol. XLIV (October): pp. 345- 366.

13. Friedman, Daniel (1989) "The Efficient Breach Fallacy," Journal of Legal Studies, Vol. 18, pp. 1-24.

14. Gilbert, Richard and Oliver Williamson (1998) "Antitrust Policy," in The New Palgrave Dictionary of Economics and the Law, P. Newman, ed., Vol. 1, pp. 82-88.

15. Hardin, Garrett (1968) "The Tragedy of the Commons" Science 162: 1243-48. 84

16. Hirshleifer, Jack (1971) "The Private and Social Value of Information and the Reward to Inventive Activity," American Economic Review, Vol.61, pp. 561- 574.

17. Massey I T (1995) Administrative Law, Eastern Book Company

18. Posner, Richard A (1998) Economic Analysis of Law, (5th edition) Little Brown, Boston.

19. Robert D Cooter and Thomas Ulen (2012) Law and Economics, Addison Wesley-Pearson

20. Seervai H M, (1991) Constitutional Law of India, Vol. 1-3, Tripathi N.M, The University of Michigan

21. Steven Shavell (2004) "Foundations of Economic Analysis of Law, Harvard University Press: Cambridge MA

22. Thomas J Micely (2004) "Economic Approach to Law", Stanford University Press

23. Yoram Barzel (1997) "Economic Analysis of Property Rights"; Cambridge University Press

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APS COLLEGE OF ARTS AND SCIENCE, N.R.COLONY, BANGALORE-560019

I,III,V SEMESTER BCA TIME TABLE FOR THE ACADEMIC YEAR 2023-2024

DAYS/Time	SEM	8.30-9.30	9.30-10.30	10.30-11.30	11.30-12.30	12.30-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00
MONDAY	I		PST	DS	Lang	L	←PST/DS	OE	EVS	---→
	III		English	CN	Lang		OE			
	V	AI	WEBPR	CG	Lunch	DA	QTY			
TUESDAY	I		EVS	LANG	DSt		←--PST	/ DS Lab-	---→	
	III		Python	OE	English		LANG			
	V	AI	DA	CG		WEBPR	QTY			
WEDNESDAY	I		DS	LANG	English		←-----OMT Lab -English-- batch1→			
	III		Lang	CN	Python		← -CAR LAB OE /CN Lab-→			
	V	AI	DA	CG		WEBPR				
THURSDAY	I		DS	PST	Lang		English	HW		
	III		English	Python	CN		OE	<- CAR LAB OE /CN Lab ->		
	V	AI	DA	WEPR		←---------Webpr/DA LAB----------→				
FRIDAY	I		English	PSt	OE		←---------OMT LABBatch2 -------→			
	III	OS	LANG	←- Python/CN Lab->			Dsi	English		
	V		DA	Presentation	WEBPR					
SATURDAY	I		Dst	OE	EVS					
	III	OS	Python	←- Python/CN Lab->						
	V		Qty	DA	CG		EVS			

Head of the Department Computer Science
APS COLLEGE OF ARTS & SCIENCE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

A.P.S College of Arts and Scien[illegible] Colony, Ba[illegible]

Department of Comp[illegible]er Science

BCA II, IV,VI SEMESTER TIME TABLE-2023-24

DAY /TIME	SEM	8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	12:30-1:00	1:00-2:00	2:00-3:00	3:00 -4:00
MONDAY	II		JAVA	CA	LANG		ENGLISH	OE	
	IV		ENGLISH	IT	LANG		<-IT/ADA LAB->		
	VI	EC	MAD	ML	LUNCH		<-PROJECT/SEMINAR->		
TUESDAY	II		JAVA	LANG	DBMS		OE		
	IV		SE	IT	ENGLISH		LANG	IC	
	VI	EC	MAD	ML	LUNCH		<---ML/MAD LAB--->		
WEDNESDAY	II		CA	LANG	ENGLISH		JAVA		
	IV		LANG	ENGLISH	IT		IC	<-IT/ADA LAB->	
	VI	EC	<---ML/MAD LAB--->			LUNCH	OR		
THURSDAY	II		DBMS	JAVA	LANG		OE	ENGLISH	
	IV		SE	ADA	LANG		IC		
	VI		ML	OR	MAD		<-INTERNSHIP->		
FRIDAY	II		ENGLISH	<-JAVA/DBMS LAB->			DBMS		
	IV	SE	FEIAW	ENGLISH	LUNCH		LANG		
	VI		MAD	OR	ML		<-INTERNSHIP->		
SATURDAY	II		CA	<-JAVA/DBMS LAB->			OE		
	IV	ADA	<-FEIAW->						
	VI	<-PROJECT->			OR				

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APSCollegeofArts&Science

TimeTablefortheAcademicyear2023-24

(I sem B.Sc)

Day	9.30–10.30	10.30–11.30	11.30–12.30	12.30–1.00	1.00–2.00	2.00–3.00	3.00–4.00	4.00–5.00
Monday	----------MathsLab----------				Kan/San	OE	EVS	
Tuesday	Eng	Maths	OE	Lunch	----------Physics/ComputerLab----------			
Wednesday	Physics/Computer	OE	Maths	Lunch	Kan/San	Eng	Physics/Computer (R)	
Thursday	Maths	Eng	Physics/Computer	Lunch	Kan/San	Maths	Sports	
Friday	Yoga	Kan/San	Maths	Lunch	Physics/Computer	EVS	Sports	
Saturday	EVS	Yoga	Eng	Lunch	Physics/Computer			

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APSCollegeofArts&Science

TimeTablefortheAcademicyear2023-24

(V sem B.Sc)

Day	9.30–10.30	10.30– 11.30	11.30– 12.30	12.30 –1.00	1.00–2.00	2.00–3.00	3.00–4.00	4.00 – 5.00
Monday	Maths/Chemi	Physics/Botany	Maths/Chemi	Lunch	----------Physics/BotanyLab----------			
Tuesday	----------Maths/ChemiLab----------				Physics/Botany	Maths/Chemi	Maths/Chemi (R)	
Wednesday	Maths/Chem	Physics/Botany	CyberSecurity	Lunch	Physics/Botany	Maths/Chemi	Sports	
Thursday	----------Maths/ChemiLab----------				Physics/Computer	CyberSecurity	Maths/Chemi	
Friday	Physics/Botany	Maths/Chemi	Physics/Botany	Lunch	----------Physics/BotanyLab----------			
Saturday	CyberSecurity	Maths/Chemi	Physics/Botany	Lunch	Physics/Botany (R)	Sports		

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N. R. Colony, Bengaluru- 560019

II and VI Semester B.Sc., Time Table for the Academic Year 2023- 2024

Day/ Time	Sem.	9:30 -10:30 am	10:30 -11:30 am	11:30 -12:30 pm	12:30 - 1:00 pm	1:00 -2:00 pm	2:00 - 3:00 pm	3:00 - 4:00 pm
Monday	II	--------Mathematics Python Lab----------				Kan. / San.	OE	DF
	VI	Maths/ Chemistry	Physics/ Botany	Maths/ Chemistry	Lunch Break	Physics/ Botany	Maths	
Tuesday	II	DF	Mathematics	Physics	Lunch Break	----------Physics Lab--------		
	VI	Mathematics Lab / Chemistry Lab (Paper- 5)			Chemistry	Physics	Maths/ Botany	
Wednesday	II	Mathematics	Physics	Mathematics	Lunch Break	English	Kan. / San.	Physics (R)
	VI	Physics/ Chemistry	Maths/ Botany	Physics/ Chemistry	Lunch Break	----------Physics Lab/ Botany Lab (Paper- 5)------		
Thursday	II	Physics	English	Physics	Lunch Break	Kan. / San.	Maths (R)	Sports
	VI	Mathematics Lab / Chemistry Lab (Paper- 6)			Chemistry	Maths/ Botany	Physics/ Botany	
Friday	II	Yoga	Kan. / San.	OE	Lunch Break	Mathematics	English	
	VI	Maths/ Chemistry	Physics/ Botany	Maths/ Chemistry	Lunch Break	----------Physics Lab/ Botany Lab (Paper- 6)------		
Saturday	II	English	OE	DF	Lunch Break	Sports		
	VI	Physics/ Botany	Internship	Internship				

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Principal 1/4/24
PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

APS College of Arts & Science

BA I, III and V Semester Time Table for the Academic year 2022-23

Days	Sem	8.30 to 9.30	9.30 to 10.30	10.30 to 11.30	11.30 to 12.30	12.30 to 1.00	1.00 to 1.30	1.30 to 2.30	2.30 to 3.30	3.30 to 4.30
Monday	I		English	Opt. Kannada/ Sociology/Music	Economics	Lunch	RC – OK/PS/PSY	Psychology – Music Practical		History
							Sports	Opt. Kannada	History	
	III		Opt. Kannada/ Pol. Science Sociology/Music	English	Opt. Kannada/ Pol. Science	Lunch	RC-History/ Sociology/Musi c	Economics	Kannada	SBS
	V		Economics	Psychology/Pol. Science	Sociology/ History	Economics		Music/ Opt. Kannada	Sociology/P ol. Science	D & F
Tuesday	I		Sociology/ Opt. Kannada/ Music	Kannada	English	Lunch	Sports	Economics	Digital Fluency	Pol. Science/ Musi
	III		English	Opt. Kannaca/Music/ Sociology/Pol. Science	Kannada	Lunch	RC-Economics/ Pol.Science/ Psychology	Psychology/Music Practical		
								History		
	V		Opt Kannada/Music/ Pol. Science	Economics	History/ Sociology	Economics		Pol.Science/ Opt. Kannada	Sociology/Hi story	D & I
Wednesday	I	#	Economics	History/Sociology	Opt. Kannada/ Pol. Science/ Music	History/ Psychology	RC- Eco/ Socio/His	English	Pol. Science/ Music/Socio logy	OE - BA [Spar. Kan]/Botany/Econ omics
	III		Sociology/History	Pol. Science/Music	Psychology	Lunch	Sports/Yoga	Opt. Kannada/ Economics	English	S &
	V		Psychology/Opt. Kannada	Economics	History	Opt. Kannada/ Pol. Science/ Music/ Sociology		Psychology/Music Practical		
Thursday	I	Yoga	History/Psychology	Economics	Health & Wellnes	Pol. Science/Opt. Kannada		Economics	Kannada	OE [Spar. Kan]/Botany/Econ omics
	III		Economics/Sociology	English	Opt. Kannada/ Pol. Science/Music	Psychology		History/ Sociology	OE	Kannada
	V		Opt. Kannada/Pol. Science/ Music	History	Economics	Sociology/Music		Psychology/Music Practical		
								Pol. Science	History	
Friday	I		Psychology/Pol. Science	Opt. Kannada/Sociology	Kannada	Lunch	Yoga	Digital Fluency	Psychology	OE [Spar. Kan]/Botany/Econ omics
	III		Kananda	Pol. Science/History	Economics/Sociology	Lunch	Yoga/ Sports	Psychology/ Economics/ History	S & S	OE
	V		Economics	Psychology/History	Pol. Science/Opt. Kannada	Economics		Opt. Kannada/ Pol. Science	History/Soci ology	Psychology/History
Saturday	I	Digital Fluency	Economics/sociology	History / Psychology	Kannada	Opt. Kannada / Pol. Science		English		
	III		Psychology	Opt. Kannada	History/Psychology	OE		History/Economics		
	V	D & F	Opt. Kannada/Pol. Science	Economics	Economics	Sociology / History		Psychology/ opt. Kannada		

- RC – Remedial Class
- OE – Open Elective

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

PRINCIPAL
APS College of Arts & Science

PRINCIPAL
APS College of Arts & Sc

APS College of Arts & Science

BA II, IV and VI Semester Time Table for the Academic year 2023-24

Days	Sem	8.30 to 9.30	9.30 to 10.30	10.30 to 11.30	11.30 to 12.30	12.30 to 1.30	1.30 to 2.30	2.30 to 3.30	3.30 to 4.30
Monday	II		English	Economics / Music/ Sociology	Political Science/ Opt. Kannada/Psychology	History	Psychology Practical (1.00 to 5.00 pm)		
	IV		History / Sociology	Lang. Kannada	Psy /OK /Music/		OK/Pol Sc		IC
	VI		Economics	Pol. Science / Opt. Kannada/ Psychology	History / Sociology		English	History	ECONOMICS
Tuesday	II		History / Psychology	Lang. Kannada	Sociology / Music / Economics	Pol. Science/ /Psychology	Economics	Sociology/ Al Sc	
	IV		Sociology/ OK	Psychology/ Pol. Science/Music	English	Economics	History	Economics/ Sociology	
	VI		Economics	History/Sociology	Pol. Science/ Opt. Kannada / Psychology/ Music		Sociology	IC	
Wednesday	II		Pol. Science/Psychology	Sociology/Opt. Kan	Lang. Kannada	Economics	Psychology-Music Practical		
	IV		English	History / Psychology/ Economics	Pol. Science / Sociology		Pol. Science / Opt. Kannada	History	History
	VI		History / Sociology	Pol. Science / Opt. Kannada/ Psychology	Economics	Pol. Science	Sociology / History	Opt. Kannada	
Thursday	II	Music Practical			OE		IC	Pol. Science / Psychology	
	IV		Pol. Science	Opt. Kannada/Sociology			Opt. Kannada/ Psychology	ECONOMICS	HISTORY
	VI		History / Economics	Lang. Kannada	Sociology / OK	Pol. Science	EVS	English	History
Friday	II		Sociology / Opt. Kannada	Economics	History / Psychology / Music		FEIA	FEIA	Economics
	IV		English	History / Psychology	Lang.Kannada	Sociology/Music Economics	Psychology – Music Practical		
	VI		Opt. Kannada / Pol. Science/ Music/ Sociology	Lang. Kannada	FEIA	History	Pol. Sci / OK	History	Pol. Science/ OK
Saturday	II		Economics	Sociology/ OK/ Political Science/ Music	Psychology/History		OB	Pol. Science / OK	EVS
	IV		Lang. Kannada	EVS	English	OE	Psychology – Music Practical (1.00 to 5.00 pm)		
	VI		History	English	Lang. Kannada	Economics / Sociology/ Opt. Kannada	OK/Pol. Science	Economics	
			Economics	Sociology / Pol. Science / Opt. Kannada/Music	History/Sociology	Pol. Science/OK	Economics	E & I	E & I
							Economics		
							Pol. Science/ Opt. Kannada		

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

PRINCIPAL
APS College of Arts & Science

Principal
PRINCIPAL
APS College of Arts & Science

A.P.S. COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF POST-GRADUATE STUDIES IN ECONOMICS (M.A)

TIME TABLE – 1st AND 3rd SEMESTER, 2023-2024

1st SEMESTER

DAY/ TIME	9:30 10:30	10:30 11:30	11:30 12:30	12:30 1:30	1:30 2:30	2:30 3:30
MON	Advanced Micro Economics (V.M)	Indian Economics (C.M)	Mathematical Methods in Economics (C.M)	L U N C H	Advanced Macro Economics (V.M)	Economic Thought (C.M)
TUE	Economic Thought (C.M)	Advanced Micro Economics (V.M)	Indian Economics (C.M)		Advanced Macro Economics (V.M)	.....
WED	Advanced Micro Economics (V.M)	Mathematical Methods in Economics (C.M)	Economic Thought (C.M)		Library/Seminar	Indian Economics (C.M)
THU	Advanced Micro Economics (V.M)	Mathematical Methods in Economics (C.M)	Advanced Macro Economics (V.M)		Library/Seminar	.....
FRI	Advanced Micro Economics (V.M)	Economic Thought (C.M)	Advanced Macro Economics (V.M)		Economic Thought (C.M)	Indian Economics (C.M)
SAT	Advanced Macro Economics (V.M)	Mathematical Methods in Economics (C.M)	Mathematical Methods in Economics (C.M)		Library/Seminar	.....

3rd SEMESTER

DAY/ TIME	9:30 10:30	10:30 11:30	11:30 12:30	12:30 1:30	1:30 2:30	2:30 3:30
MON	Econometrics-I (C.M)	International Economics (V.M)	OE Economics (V.M)	L U N C H	Environmental Economics (C.M)	Development Economics (V.M)
TUE	International Economics (V.M)	Econometrics-I (C.M)	Development Economics (V.M)		Environmental Economics (C.M)	OE Economics (V.M)
WED	Econometrics-I (C.M)	International Economics (V.M)	Development Economics (V.M)		Environmental Economics (C.M)	OE Economics (V.M)
THU	Econometrics-I (C.M)	Development Economics (V.M)	Environmental Economics (C.M)		International Economics (V.M)	.....
FRI	Environmental Economics (C.M)	Development Economics (V.M)	Environmental Economics (C.M)		OE Economics (V.M)	.....
SAT	Econometrics-I (C.M)	International Economics (V.M)	OE Economics (V.M)		Library/Seminar	.....

H.O.D & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

A.P.S. COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF POST-GRADUATE STUDIES IN ECONOMICS (M.A)

TIME TABLE – 2ND AND 4TH SEMESTER, 2023-2024

2ND SEMESTER

DAY/ TIME	9:30 10:30	10:30 11:30	11:30 12:30	12:30 1:30	1:30 2:30	2:30 3:30
MON	Advanced Micro Economics (V.M)	Agricultural Economics (C.M)	Statistical Methods in Economics (C.M)	L U N C H	Indian Political System (C.M)	Advanced Macro Economics (V.M)
TUE	Indian Political System (C.M)	Advanced Micro Economics (V.M)	Agricultural Economics (C.M)		Advanced Macro Economics (V.M)	.....
WED	Advanced Micro Economics (V.M)	Statistical Methods in Economics (C.M)	Agricultural Economics (C.M)		Indian Political System (C.M)	Agricultural Economics (C.M)
THU	Advanced Micro Economics (V.M)	Statistical Methods in Economics (C.M)	Advanced Macro Economics (V.M)		Library/Seminar	.....
FRI	Statistical Methods in Economics (C.M)	Indian Political System (C.M)	Advanced Macro Economics (V.M)		Indian Political System (C.M)	Agricultural Economics (C.M)
SAT	Advanced Macro Economics (V.M)	Statistical Methods in Economics (C.M)	Advanced Micro Economics (V.M)		.....	.....

4TH SEMESTER

DAY/ TIME	9:30 10:30	10:30 11:30	11:30 12:30	12:30 1:30	1:30 2:30	2:30 3:30
MON	Econometrics-II (C.M)	Public Economic (V.M)	Economics of Infrastructure (C.M)	L U N C H	Economics of Demography (V.M)	Project Work (C.M)
TUE	Public Economic (V.M)	Econometrics-II (C.M)	Economics of Demography (V.M)		Economics of Infrastructure (C.M)	Project Work (C.M)
WED	Econometrics-II (C.M)	Public Economic (V.M)	Economics of Demography (V.M)		Project Work (V.M)	Project Work (V.M)
THU	Econometrics-II (C.M)	Economics of Demography (V.M)	Economics of Infrastructure (C.M)		Public Economic (V.M)	Project Work (C.M)
FRI	Project Work (V.M)	Economics of Demography (V.M)	Economics of Infrastructure (C.M)		Economics of Infrastructure (C.M)	Project Work (V.M)
SAT	Econometrics-II (C.M)	Public Economic (V.M)	Economics of Infrastructure (C.M)		.....	.....

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

A.P.S. College of Arts and Science N.R. Colony, Bangalore-560019 2023-24

Problem Solving Techniques PSTC25-1

	Topics Covered	No. of hours per week -3hrs	Total hours
0.	UNIT-1 Introduction: The Role of Algorithm in computing, Algorithm as a technology,	I week	12HOURS
	nalysing algorithms. signing Algorithms, Growth of Functions, Asymptotic Notation.	II Week	
	andard Notations and common functions undamental Algorithms: Exchange the value of two variables, Counting,		
	Summation of a set of numbers.	III Week	
5.	Factorial computation, Generating of the Fibonacci sequence Reversing the digits of an Integer, Character to Number conversion		
3.	UNIT-2 C Programming: Getting started, Variables and Arithmetic expressions,	IV Week	12hrs
	Standard Input and Output, Formatted output-printf. Variable length argument list, formatted input-scanf.		
	ontrol flow statements and Blocks: If else, else-if, Switch.	V Week	
	Loops:while loop, for loop,do-while, break and Continue		
	Goto and labels, Pointers and arrays: Pointers and address, pointers and	VI Week	
	function arguments, multidimensional array, Initialization of pointer arrays, command line arguments.		
	UNIT-3 Factoring methods: Finding the square root of a number, the smallest Divisor	VII Week	12hrs
	of an Integer The greatest common divisor of two integers, Computing the prime factors of		
	an integer Generation of pseudo random numbers, raising a number to a large power,	VIII Week	
	Array techniques: Array order reversal, Array counting or Histogramming.		
	Finding the maximum number in a set, removal of duplicates from an ordered	IX Week	12hrs
	array, Partitioning an array, Finding the kthsmallest element, multiplication of two		
	matrices UNIT-4		
	Merging:the two-way merge, Sorting:sorting by selection,	X Week	12hrs
	Sorting by exchange, sorting by insertion		
	Sorting by diminishing increment, Sorting by partitioning	XI Week	
12	Searching: Binary search, Hash search	XII Week	
	Text processing and pattern searching, text line length adjustment,		
	Keyword searching in text, text-line editing, linear pattern search		

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 ...

A.P.S. College of Arts and Science, N.R. Colony, Bangalore - 560019.

Total Teaching Hours:48 Lesson Plan:Data Structures C3T 2022-24

Sl.no	Date	Topics Covered	Total No of Hours-48
1.	1st week	Unit – 1: Introduction and Overview: Definition, Elementary data organization, Data Structures, data Structures operations, Abstract data types, algorithms complexity, time-space trade off.	3 hours per week Total 12 hours for unit I
2.	2nd week	Preliminaries: Mathematical notations and functions, Algorithmic notations, control structures, Complexity of algorithms, asymptotic notations for complexity of algorithms.	
3	3rd week	Arrays: Definition, Linear arrays, arrays as ADT, Representation of Linear Arrays in Memory, Traversing Linear arrays, Inserting and deleting, Multi-dimensional arrays, Matrices and Sparse matrices.	
4.	4th week	Unit-2: Linked list: Definition, Representation of Singly Linked List in memory, Traversing a Singly linked list, Searching in a Singly linked list, Memory allocation, Garbage collection, Insertion into a singly linked list, Deletion from a singly linked list;	3 hours per week Total 12 hours for unit II
5	5th week	Doubly linked list, Header linked list, Circular linked list. Stacks: Definition, Array representation of stacks, Linked representation of stacks, Stack as ADT, Arithmetic Expressions: Polish Notation, Conversion of infix expression to postfix expression,	
6	6th week	Evaluation of Post fix expression, Application of Stacks, Recursion, Towers of Hanoi, Implementation of recursive procedures by stack. Queues: Definition, Array representation of queue, Linked list representation of queues. Types of queue: Simple queue, Circular queue, Double-ended queue, Priority queue, Operations on Queues, Applications of queues.	
7	7th week	UNIT-3 Binary Trees: Definitions, Tree Search, Traversal of Binary Tree, Tree Sort, Building a Binary Search Tree, Height Balance: AVL Trees, Contiguous Representation of Binary Trees: Heaps,	3 hours per week Total 12 hours for unit III
8	8th week	Lexicographic Search Trees: Tries, External Searching: B-Trees, Applications of Trees.	
9	9th week	Graphs: Mathematical Back ground, Computer Representation, Graph Traversal, Topolcgical Sorting	
10	10th week	UNIT-4 Searching: Introduction and Notation, Sequential Search, Binary Search, Comparison of Methods.	3 hours per week Total 12 hours for unit IV
11	11th week	Sorting: Introduction and Notation, Insertion Sort, Selection Sort, Shell Sort, Divide And Conquer, Merge sort for Linked List, Quick sort for Contiguous List.	
12	12th week	Hashing: Sparse Tables, Choosing a Hash function, Collision Resolution with Open Addressing, Collision Resolution by Chaining.	

Head of the Dept. of Computer Science
APS College of Arts & Science

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APS COLLEGE OF ARTS AND SCIENCE, N.R.COLONY, BANGALORE-560019

2023-2024

BCA VI SEMESTERCA-BCA-603T : WEB PROGRAMMING

TOTAL HOURS= 60 HOURS **No. of Hours / Week: 04**

SI N	WEEKS	TOPICS COVERED	NO OF HOURS	TOTAL HOURS
1	1ST WEEK 2ND WEEK 3RD WEEK	**Unit - I :**Fundamentals of Web: Internet – World Wide Web - Web Browsers - Web Servers – URLs – MIME – Internet Security - The Web Programmers Toolbox. Java Script and HTML Documents: The JavaScript execution environment - The Document Object Model - Element access in JavaScript - Events and event handling - Handling events from the Body elements, Button elements, Text box and Password elements - The DOM 2 event model - The navigator object - DOM tree traversal and modification	5 HOURS 5 HOURS 5 HOURS	15 HOURS
2	4TH WEEK 5TH WEEK 6TH WEEK	**Unit - II :**. Dynamic Documents with JavaScript: Introduction to dynamic documents - Positioning elements - Moving elements - Element visibility - Changing colours and fonts - Dynamic content - Stacking elements - Locating the mouse cursor - Reacting to a mouse click - Slow movement of elements - Dragging and dropping elements. XML: Introduction – Syntax - Document structure - Document Type definitions - Namespaces - XML schemas - Displaying raw XML documents - Displaying XML documents with CSS - XSLT style sheets - XML Processors - Web services.	5 HOURS 5 HOURS 5 HOURS	15 HOURS
3	7TH WEEK 8TH WEEK 9TH WEEK	**Unit - III :**Introduction to PHP: The Structure of PHP-Using Comments -Basic Syntax -Variables Operators -Variable Assignment -Multiple-Line Commands -Variable Typing -Constants Predefined Constants -The Difference Between the echo and print Commands - Functions Variable Scope, Expressions and Control Flow in PHP: Operators -Operator Precedence - Associatively Relational Operators - Conditionals: The if Statement -The else Statement - The elseif Statement -The switch Statement - The ? Operator - Looping: while Loops - do...while Loops for Loops -Breaking Out of a Loop-The continue Statement	5 HOURS 5 HOURS 5 HOURS	15 HOURS
4	10th Week 11th Week 12th Week	**Unit – IV :**PHP Functions and Objects: PHP Functions - Defining a Function - Returning a Value Returning an Array - Do Not Pass Arguments by Reference - Returning Global Variables. PHP Arrays: Numerically Indexed Arrays - Associative Arrays - Assignment Using the array Keyword - The for each...as Loop -Multidimensional Arrays - Using Array Functions-Date and Time Functions. File Handling: Checking Whether a File Exists - Creating a File - Reading from Files - Copying Files - Moving a File - Deleting a File - Updating Files - Locking Files for - Multiple Accesses Reading an Entire File - Uploading Files. Exception Handling, Cookies and connecting to database	5 HOURS 5 HOURS 5 HOURS	15 HOURS
		TOTAL HOURS=		60hours

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS & SCIENCE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

CA-C13T: PYTHON PROGRAMMINGIII SEM BCA

Total Teaching Hours: 48 2023-2024 No. of Hours/Week: 03

SI NO	WEEKS	TOPICS COVERED	TOTAL NO OF HOURS/ WEEK
	1ST WEEK 2ND WEEK 3RD WEEK	**Unit I:** **Parts Python Programming Language:** Python Interpreter/Shell, Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() function and Is operator, Dynamic and Strongly Typed Language. **Control Flow Statements:** The if Decision Control Flow Statement, The if…else Decision Control, Flow Statement, The if…el if…else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements. **Functions**: Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Life time of Variables, Default Parameters, Command Line Arguments. **Strings:** Creating and Storing Strings, Basic String operations, Accessing Characters in String by Index Number, String Slicing and Joining, String methods	12 Hours
2	4TH WEEK 5TH WEEK 6TH WEEK	**Unit II:** **Lists:** Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement, **Dictionaries:** Creating Dictionary, Accessing and modifying key: value pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary methods, The del Statement. **Tuples and Sets:** Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions Used onTuples, Relations between Tuples and Lists, Relations between Tuples and Dictionaries, Tuple Methods, Using zip () Function, Sets, Set Methods, Frozen et.	12Hours
3	7TH WEEK 8TH WEEK 9TH WEEK	**Unit III:** **Files:** Types of files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle module, Reading and writing CSV files, **Object-Oriented Programming:** Classes and Objects, Creating Classes in Python, Creating Objects in Python, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data attributes, Encapsulation, Inheritance, The Polymorphism.	12 Hours
4	10th Week 11th Week 12th Week	**Unit IV:** **Data Visualization:** Generating Data-Installing Matplotlib, Plotting a Simple Line Graph, Random Walks, Rolling Dice with Plotly. Downloading Data- The CSV File Format, Mapping Global Data Sets: JSON Format, **Working with APIs:** Using a Web API, Visualizing Repositories Using Plotly.	12 Hours
		TOTAL HOURS=	48 HOURS

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS & SCIENCE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

CA-C12T: COMPUTER NETWORKS III SEM BCA

2023-2024

Total Teaching Hours: 48 No. of Hours/Week: 03

SI NO	WEEKS	TOPICS COVERED	TOTAL NO OF HOURS/ WEEK
1	1ST WEEK 2ND WEEK 3RD WEEK	**Unit I:** Introduction: Data Communications, Networks, Network Types, Internet History, Network Models: Protocol Layering, The OSI Model, TCP/IP Protocol Suite, Introduction to Physical Layer: Transmission Impairments, Data Rate Limits, Performance, Introduction to Data-Link-Layer: Link-Layer Addressing, Error Detection and Correction: Block Coding, Cyclic Codes, Checksum	12 Hours
2	4TH WEEK 5TH WEEK 6TH WEEK	**Unit II:** Data Link Control: Data-Link Layer Protocols, HDLC, Point-To-Point (PPP), Media Access Control(MAC): ALOHA, CSMA, CSMA/CD, CSMA/CA, Reservation, Polling, Token Passing, FDMA, TDMA,CDMA	12Hours
	7TH WEEK 8TH WEEK 9TH WEEK	**Unit III:** Introduction to Network Layer: Network-Layer Services, Packet Switching, Network-Layer Performance, IPV4 Addresses, Network Layer Protocols: Internet Protocol (IP), ICMPv4, Mobile IP, Unicast Routing: Routing Algorithms, Unicast Routing Protocols, Next Generation IP: IPv6 Addressing	12 Hours
4	10th Week 11th Week 12th Week	**Unit IV:** Introduction to Transport Layer: Introduction, Transport-Layer Protocols, Transport-Layer Protocols: User Datagram Protocol, Transmission Control Protocol: TCP Services, TCP Features, Segment, A TCP Connection, TCP Congestion Control, Flow Control, Error Control, Application Layer: WWW, E-MAIL, Domain Name System (DNS), Quality of Service: Flow Control To Improves QoS, Integrated Services	12 Hours
		TOTAL HOURS=	48 HOURS

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS & SCIENCE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

BCA IV SEM BCA405T SOFTWARE ENGINEERING

TOTAL HOURS= 65 HOURS 2023-2024 **No. of Hours / Week: 05**

SI NO	WEEKS	TOPICS COVERED	TOTAL NO OF HOURS/ WEEK
1	1ST WEEK 2ND WEEK 3RD WEEK	**Unit I:** Introduction: Software Products and Software process, Process models: Waterfall modal, Evolutionary Development, Bohemia's Spiral model, Overview of risk management, Process Visibility, Professional responsibility, Computer based System Engineering: Systems and their environment, System Procurement, System Engineering Process, System architecture modeling. Human Factors, System reliability Engineering. Requirements and Specification: The requirement Engineering Process, The Software requirement document, Validation of Evolution of requirements, View point oriented & method based analysis, system contexts, and Social7 organizational factors. Data flow, Semantic, Objects, models, Requirement Specification, Non functional requirement.	13 Hours
2	4TH WEEK 5TH WEEK 6TH WEEK	**Unit II:** Software Prototyping: Prototyping in software process, Prototyping techniques, User interface prototyping. Software Design: Design Process, Design Strategies, Design Quality , System Structuring control models, Modular decomposition, Domain Specific architecture	13 Hours
3.	7TH WEEK 8TH WEEK 9TH WEEK	**Unit III:** Object Oriented & function oriented design: Objects, object Classes and inheritance Object identification, An object oriented design example, Concurrent Objects, Data flow design Structural decomposition, Detailed Design, A Comparison of design Strategies. User interface design: Design Principles, User System interaction, Information Presentation, User Guidance, Interface Evaluation	13 Hours
4	10th Week 11th Week 12th Week	**Unit IV:** Software Reliability and reusability : Software reliability metrics , Software reliability Specification, Statistical testing ,Reliability Growth modeling, Fault avoidance& tolerance, Exception handling& defensive programming , Software development with reuse, Software' development for reuse , Generator based reuse, Application System Portability	13 Hours
5	13th Week 14th Week 15th Week	**Unit-V** Software Verification and Validation: The testing Process, Test Planning & Strategies, Black Box , Structural, interface testing , Program inspections , Mathematically based verification, Static analysis tools, Clean room software development. Management Issues: Project management, Quality management, Software cost estimation, Software maintenance	13 Hours
		TOTAL HOURS=	65HOURS

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS & SCIENCE

BCA IV SEMESTER CA-C18T: INTERNET TECHNOLOGIES

2023 -2024

TOTAL HOURS= 48 HOURS **No. of Hours / Week: 03**

SI NO	WEEKS	TOPICS COVERED	NO OF HOURS	TOTAL NO OF HOURS
1	1ST WEEK 2ND WEEK 3RD WEEK	**Unit - I :** **Interconnected Network:** Internet: The Giant Wide Area Network, Communicating over the Internet, Accessing the Internet, Internet Organizations, Cyber Ethics, **Internet Applications:** Internet services, Electronic Mail(E-Mail), File Transfer, Real-Time User Communication, Remote Login , Usenet, **World Wide Web**: The Web, The Working Web, Web Terminology, Web Architecture, World Wide Web Challenges.	4 HOURS 4 HOURS 4 HOURS	12 HOURS
2	4TH WEEK 5TH WEEK 6TH WEEK	**Unit - II** **Hypertext Transfer Protocol (HTTP):**HTTP, HTTP Version, HTTP connections, HTTP Communication, Hypertext Transfer Protocol Secure, Hypertext Transfer Protocol State Retention: Cookies, Hypertext Transfer Protocol Cache, **Evolution of Web:** The Generations of Web, Web 1.0, Web 2.0, Web 3.0, Big Data: A Special Discussion, **Web IR: Information Retrieval on the Web:** Web Information Retrieval, Web Information Retrieval Tools, Web Information Retrieval Architecture (Search Engine Architecture), Web Information Retrieval Performance Metrics, Web Information Retrieval Models, Google Page Rank.	4 HOURS 4 HOURS 4 HOURS	12 HOURS
3	7TH WEEK 8TH WEEK 9TH WEEK	**Unit - III** **Web Development Basics:** Elements of Web Development , Client-Side and Server-Side Scripting, Model-View-Controller Architecture for Web Application Development, **Client-Side Technologies:** HTML: Hypertext Markup Language, CSS: Cascading Style Sheets, JavaScript, Bootstrap Framework, Angular JS Framework, **Server-Side Technologies:** Server-Side Scripting, Personal Home Pages, Node.js: Server-Side JavaScript	4 HOURS 4 HOURS 4 HOURS	12 HOURS
4	10th Week 11th Week 12th Week	**Unit – IV** **Web Application Frameworks:** Django, Ruby on Rails. **Web Databases:** Web Database, Structured Query Language: Relational Databases, No SQL Databases: Non-relational and Distributed Data, Understanding Popular Databases. **Research Trends on the Web:** Contextual Information Retrieval, Web Mining.	4 HOURS 4 HOURS 4 HOURS	12 HOURS
		TOTAL HOURS=		48 HOURS

Head of the Dept. of Computer Science
APS COLLEGE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560019

IIISEM BA/B.Sc SEC (Artificial Intelligence)

Total Teaching Hours: 36 2023-2024 No. of Hours/Week: 03

SI NO	TOPICS COVERED	TOTAL NO OF HOURS/ WEEK
	Course- 1: Azure AI Fundamentals AI -900 pathway consists of 5 courses and 2 reading material: i. Introduction to AI on Azure ii. Use visual tools to create machine learning models with Azure Machine Learning. iii. Explore computer vision in Microsoft Azure iv. Explore natural language processing v. Explore conversational Ai vi. Tune Model Hper parameters- Azure Machine Learning (Reading) vii. Neural Network Regression: Module Reference – Azure Machine Learning (Reading)	05 Hours
2	**Practical** 1. Prepare the data 2. Model the data 3. Visualize the data 4. Analyze the data 5. Deploy and maintain deliverables	13 Hours
3.	**.Course – 2 Data Analyst Associate (DA- 100)** DA-100 pathway consists of 5 courses and 2 reading material: 1. Get started with Microsoft Data Analytics 2. Prepare data for analysis 3. Model data in Power BI 4. Visualize data in Power BI 5. Data Analysis in Power BI 6. Manage workspaces and datasets in Power BI 7. Key Influencers Visualizations Tutorials- Power BI 8. Smart Narratives Tutorial- Power Bi | Microsoft Docs	05 Hours
	Practical 1. describe Artificial Intelligence workloads and considerations 2. Describe fundamental principles of machine learning on Azure 3. Describe feature of computer vision workloads on Azure 4. Describe feature of Natural Language Processing (NLP) workload on Azure	13 Hours
	TOTAL HOURS=	36 HOURS

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS & SCIENCE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APS COLLEGE OF ARTS AND SCIENCE, N.R.COLONY, BANGALORE-560019

I Semester BA/B.Sc
Digital Fluency

~~III SEM BA/B.Sc SEC~~

2023-2024

Total Teaching Hours: 45 No. of Hours/Week: 03

SI NO	TOPICS COVERED	TOTAL NO OF HOURS/ WEEK
1	**Unit I:** Operating Systems, types of operating systems, major functions of the operating systems, types of user interface, examples of operating systems: MS-DOS, Windows, MacOS, Linux, Solaris, Android. Office automation tools: word processor, power point, and spread sheet.	05 Hours
2	**Unit II:** Introduction to Computer Networks, Evolution of Networking, types of networks, Network devices-Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, and Gateways, Identification of Nodes in a Networked Communication, Internet, Web and the Internet of Things, Domain Name Systems. Security Aspects-Threats and Prevention, Malware- virus, Worms, Ransom ware, Trojan, spyware, adware, key loggers, Modes of Malware distribution, Antivirus, HTTP vs. HTTPS, Firewall, Cookies, Hackers and Crackers	05 Hours
3	**Unit III:** . Database Management Systems, Relational Data Model. Introduction to e-learning platforms such as Swayam, and MOOC. Virtual Meet: Technical Requirements, Scheduling a meeting, joining virtual meet, recording the meeting. Online Forms: Creating questionnaire, Publishing Questionnaire, conducting online responses, Analyzing the responses, copying graphics into power point, Downloading the response to spreadsheet. Introduction to societal impacts, Digital Foot prints, Digital Society and Netizen, Data Protection, E-waste, Impact on Health.	05 Hours
4	Laboratory Activities: Identifying the configuration of a computer system, laptop, and a mobile phone, Identifying the version and the configuration of the operating system of a computer, laptop, and a mobile phone, Identifying the network components like patch cord, switch, RJ 45Jack, Socket and wireless router, creating a hotspot from a mobile phone, and allowing others to use the hotspot, creating a Google form, and send it to five users, scheduling a virtual meet and invite three people to join the Google meet, record the virtual Meet, Creating an account in the railway reservation website, IRCTC, and finding trains from Tumkur to Hubli, creating a one minute video of your choice in your native tongue, and upload the video to YouTube, composing word document, creating tables, creating charts, preparing power point slides, simple computation using spread sheet.	30 Hours
	TOTAL HOURS=	45 HOURS

Satya

Head of the Dept. of Computer Science
APS COLLEGE OF ARTS & SCIENCE

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 0 . .

APS COLLGE OF ARTS AND SCIENCE

N.R COLONY, BENGALORE-560019

DEPARTMENT OF SOCIOLOGY

LESSON PLAN-2023-24

Acharya Pathasala College of Arts & Science

Narasimharaja colony , Bangalore -560019

Department of Sociology

Lesson plan 2023-2024

From August to January

Total No.: Hrs 42

Name of the faculty Sandhya H. R.

B.A I Semester

DSc :1 Understanding Sociology

Month	Week	Topic Or Lesson Covered	Hours
August	1	Unit – 1 Sociology as Science	
	2	Chapter No. 1 Sociology as a study of Groups and Social Interaction -	1
	3	Definition Scope and Need; Sociology	1
		Science Vs. Sociology as Social Reform	1
	4	Chapter No. 2 Foci of Sociology: Social Institution	2
		Social Inequality and Social Change	2
September	5	Chapter No. 3 Sociological Eye (Randall Collins),	2
	6	Sociological Imagination (C Wright Mills' distinction between trouble i.e. personal in nature and issue, i.e. public in nature)	2
	7	Chapter No. 4. Sociological Perspectives: Functionalist,	2
	8	Conflict, Symbolic interactionism, Feminist	2
	9	Chapter No. 5 Social Construction of Reality	2
	10	Unit :2 Culture and Socialisation	

October		Chapter No. 6. Culture: Definition and Element of Culture;	2
	11	Comparison between Culture and Civilisation	2
	12	Acculturation: Robert Ezra Park's idea of Melting Pot; Cultural Contact	2
	13	Cultural Shock, Counter Culture and Contra Culture	2
	14	Chapter No. 7. Global Culture: Globalisation of Values; Cultural Imperialism	2
November	15	Chapter No. 8. Emerging Issues in Culture	2
		Consumer Culture, Children as Consumers, Cyber culture	2
	16	Netiquette in the age of Digital Living and Digital Divide	2
	17	Chapter No. 9 Socialisation: Theories of Self:	2
		Charles Horton Cooley and George Herbert Mead	2
December	18	Unit – 3 Social Change	
		Chapter No. 10 Changes due to Industrialisation, Rationalisation,	2
	19	Rationalisation, Globalisation, Mc Donaldization (George Ritzer)	2
	20	Urbanisation and Information Explosion	2
	21	Chapter No. 11. Consequences of Change	1
	22	Technological Impact on Social Life; Changing Environment	2

HOD Signature

PRINCIPAL

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

Lesson Plan 2023-2024

Name of the faculty Sandhya H R Total No.: Hrs: 42

B.A I Semester

DSc: 2 Changing Social Institution in India

Month	Week	Topic or Lesson Covered	Hours
August	1	Unit – 1 Family and Marriage	1
	2	chapter No. 1 Family - Definitions of Family and Household;	1
	3	hanging structure of family; changes in size and composition	1
		chapter No. 2 Weakening of gender and age stratification - democratisation of relationships	2
	4	between spouses, parent-children; step-parenting	2
		Chapter No. 3 Changes in caregiving of children and elderly	2
September	5	Chapter No. 4 Marriage - Definition changing patterns of marital relations - cohabitation	2
	6	separation, divorce and remarriage	2
	7	Chapter No. 5 Changes in age of marriage	2
	8	marriage decision making and regional variations	2
	9	Chapter No. 6 Decrease in number of children and voluntary childlessness	
	10	Unit – 2 Religion and Education	2

October		Chapter No. 7. Definition secularisation resurgence of religion in modern world	2
	11	Challenge of diversity - religious freedom state laws	2
	12	Chapter No. 8 Education: Definition; education as socialisation;	2
	13	types of education - formal and informal	2
	14	Chapter No. 9 Functional view - manifest and latent functions	2
November	15	Conflict view - education as tool for perpetuating inequality	2
		Chapter No.10 Schooling and Life Chances (Max Weber's views)	2
	16	increasing enrolment ratio; Education and Employability	2
	17	- Technology and Digital Divide	2
		Unit – 3 Economic and Political Institutions	
December	18	Chapter No. 11. Definitions of Economy and Work;	2
		Gender stratification in work and its feminisation;	2
	19	chapter No. 12 Definitions of Political Institution, Government, Governance and State	2
	20	chapter No. 13 Status of Democracy in India; Challenges: Militancy, Fundamentalism, Regionalism	1
	21	Chapter No. 14 Globalisation and Social Welfare	2

HOD Signature

PRINCIPAL

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR

No. of Total Hrs - 42

B.A 2 semester

DSC:3 Foundation of Sociological Theory

Month	Week	Topic or Lesson Covered	Hours
April	1	Unit – 1 A Comte and H Spencer	
	2	Chapter 1: Auguste Comte: Intellectual context	3
	3	Positivism, Law of Three Stages,	3
	4	Classification of Sciences	2
	5	Chapter 2: Herbert Spencer: Theory of Social Evolution	3
May	6	Organic Analogy, Types of Society	3
	7	Unit - 2 K Marx and G Simmel	2
	8	Chapter 3: Karl Marx: Dialectical Materialism	3
	9	, Economic Determinism, Class Struggle, Alienation	3
	10	Chapter 4. Georg Simmel: Formal Sociology	3
Jun	11	Theory of Sociation, Theory of Conflict	3
	12	Unit - 3. E Durkheim and M Weber	2
	13	Chapter 5: Emile Durkheim: Social Facts,	3

		Division of Labour in Society	2
	14	Suicide, Sociology of Religion	2
July	15	Chapter 6: Max Weber: Social Action, Ideal Types, Bureaucracy	3
		Types of Authority,	2
	6	Protestant Ethics and Spirit of Capitalism	3

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

AcharyaPathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR

Total No : hrs 42

B.A 2 semester

DSC:4 Sociology of Rural Life In India

Month	Week	Topic or Lesson Covered	Hours
April	1	Unit – 1 Rural and Agrarian Social Structure	2
	2	Chapter No. 1: Social Construction of Rural Societies	3
		Myth and Reality (M N Srinivas)	2
	3	Chapter No. 2: Agrarian Social Structure	2
		Land Tenure Systems (Colonial Period), Post-Independence Indian Land Reform Laws	3
	4	Chapter No. 3: Commercialisation of Agriculture;	3
		Commodification of Land	
May	5	Unit - 2. Themes of Rural Society in India	3
	6	Chapter No. 4: Rural Caste and Class Structure	3
	7	Chapter No 5: Gender and Agrarian Relations	3
	8	Chapter No. 6: Impact of Panchayat Raj System	3
		Rural Politics	
Jun	9	Chapter No. 7: Actors in Market - Weekly Fairs,	3
		Trading Castes	
	10	Emerging Trading Classes and Key Role of Intermediaries	3
	11	Chapter No. 8: Emergence of Online and Virtual Commodity	3

	12	Markets - Features and Impact on Traditional Sellers and Buyers	2
	13	Unit - 3 Rural Development	
July	14	Chapter No. 9: Induced Intervention: PURA, MGNREGA	2
	15	A, Swach Bharat Abhiyan, AksharaDasoha,	2
		Water and Land Development Efforst	2
	16	Chapter No. 10: Challenges to Sustainable Rural Development	3
	17	Casteism, Factional Politics, Natural Calamities	2

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR

Total No : hrs 42

B.A 2 semester

DSC:5Sociology of Marginalised Groups

Month	Week	Topic Or Lesson Covered	Hours
August	1	Unit 1 Introduction	
	2	Chapter No 1 Marginalisation: Meaning and Nature;	3
	3	Basic Characteristics of Stratification.	2
	4	Chapter No 2. Forms of Social Stratification – Meaning	3
	5	Caste, Class, Estate	2
May	6	Chapter No.3. Dimensions of Social Stratification	2
	7	Income, Wealth, Power, Occupational Prestige, Schooling	3
	8	Unit – 2 Perspectives on Stratification	
	9	Chapter No. 4. Functional Theory: Kingsley Davis,	3
	10	Perspective& Critique by Melvin M Tumin.	2
	11	Chapter No.5. Karl Marx's Theory: Class and Social Change	4
Jun	12	Chapter No.6. Weber's Theory: Class, Status and Power	3
	13	Unit – 3. Social Mobility	2

	13	Chapter No.7. Meaning of Social Mobility;	3
	14	Forms of Social Mobility:	3
July	15	Horizontal and Vertical, Intergenerational and Intragenerational Mobility	3
	16	Chapter No.8. Role of Education and Profession in the Rise of Middle Class	3
	17	Chapter No.9. Mobility in Caste in Contemporary India	3

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 01

Acharya Pathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR Total NO.hrs : 42

B.A 4 semester

DSC:6: Population and Society

Month	Week	Topic Or Lesson Covered	Hours
April	1	Unit – 1. Introduction	
		Chapter No 1. Meaning and Definitions of Population	3
		Relationship between Society and Population	3
	2	Chapter No.2. Global Population Trends: Role of Fertility,	3
		Mortality and Migration; Power of Doubling	2
	3	Chapter No.3 Age and Sex Composition in India and its Impact	3
May	4	Demographic Dividend	2
		Unit – 2. Sources of Demographic Data	
	5	Chapter No. 4 Population Census- Uses and Limitations	3
		Indian Censuses	2
	6	Chapter No.5. Vital Registration System	3
Jun	7	Chapter No 6. National Sample Survey; Sample Registration System	3
	8	National Family Health Surveys (NFHS)	3

	9	Unit – 3. Population Theories and Policy	
	10	Chapter No.7. Population Theories: Malthusian Theory,	2
	11	Optimum Theory of Population and Demographic Transition Theory	3
July	12	Chapter No.8. Need of Population Policy;	3
	13	; Millennium Development Goals and Sustainable Development Goals	3
	14	Chapter No.9.; Population Policy of India	2
	15	Programmes and their Evaluation	1

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR

Total No: hrs : 56

B.A 6semester

DSC: 12Sociological Perspectives

Month	Week	Topic Or Lesson Covered	Hours
		Unit 1 Basics of Theory	
April	1	Chapter 1 Theory: Meaning and Features	2
		Meaning of Social Theory	2
	2	Types of Theory: Macro, Meso, Micro	2
		chapter 2 :Building Blocks: Concept, Assumption, Hypothesis,	2
	3	Need for Theoretical Thinking	2
		Chapter 3:Meaning of - Induction, Deduction, Fact, Causal Relation	2
	4	Correlation, Constant, Variable, Generalisation	2
May	5	Unit 2 Structural Functional Perspective	
		Chapter 4:Origin of Functionalism and Structuralism;	3
	6	; Meaning of: Social Structure, Social System, Function, Integration,	3
		Social Equilibrium, Social Order, Dysfunction	3
	7	Chapter 5 :Postulates of Functional Analysis	2
	8	Chapter 6Neo-functionalism	3
June	9	Unit 3 Conflict Perspective	2
	10	Chapter 7:Origin of Conflict Perspective; Meaning of: Conflict,	3
		Social Inequality, Power, Dominance,	2

	11	Authority, Class Struggle, Hegemony	2
	12	Chapter 8 :Process of Social Conflict and Social Change;	3
	13	Chapter 9 :Functions of Social Conflict	2
July	14	Unit 4 Symbolic Interaction Perspective	
	15	Chapter 10 Origin of Symbolic Interaction Perspective	2
	16	Meaning of: Symbol, Interaction, Social Construction of Reality,	3
	17	Interpretation, Reflexivity, Negotiation	3
	18	Chapter 11 :Importance of Meaning; Definition of Situation	3
	19	Chapter 12: Dramaturgy and Everyday Life	3

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Scienc
N.R. Colony, Bangalore-560 01

AcharyaPathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR

Total No: hrs : 56

B.A 6semester

DSC: 13Sociology of Health

Month	Week	Topic Or Lesson Covered	Hours
April		Unit 1 Introduction	
	1	Chapter 1 Sociology of Health; Meaning, Nature and Need;	2
		Scope: Sociology in Medicine	2
	2	Sociology of Medicine	2
	3	Chapter 2 :Emergence and Development of Sociology	3
		Sociology of Health in World and India	2
	4	Chapter 3Actors: Doctors-Nurses and Paramedical	2
		Staff-Patients and their relationship	2
May	5	Unit 2 Determinants of Health	
		Chapter 4 :Social Determinants of health: Class, Caste, Power	3
	6	Gender, Social Cohesion	2
		Chapter 5 :Cultural Determinants of health:	2
	7	: Beliefs, Nutrition, Environment	2
		Chapter 6 :Economic Determinants of health: Poverty	3
	8	Homelessness, Living Conditions,	3

		Neighbourhood	
Jun	9	Unit 3 Models of Health	
	10	Chapter 7Systems of Medicine (Biomedicine and AYUSH)	4
		Dominance of Biomedical	3
	11	Chapter 8 Sick Role and Experiencing Illness	3
	12	Chapter 9 Hospital as Social Organization	4
July	13	Unit 4 Health Care Reform	
	14	Chapter 10 Medicalisation and Pharamceuticalisation of Health	7
	15	: Report on Health Services or Functioning of Health Organisations or Selected Health Programmes at State Level	7

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts &Science

Narasimharaja Colony, Bangalore -560019

Department of Sociology

2023-2024

Name of the Faculty Sandhya HR

Total NO :Hrs62

B.A 6semester

DSC: 14-Society in Karnataka

Month	Week	Topic Or Lesson Covered	Hours
April		Unit – 1 Features of Karnataka	
	1	chapter 1: Overview of Karnataka's History:	2
		Antiquity of Land and Language Social Compos tion	2
	2	Caste, Tribe, Class as per latest Census/Sample	2
		Surveys; HDI and Regional Disparities	1
	3	Chapter 2: Geography and Politics: Spatial Feature	2
May	4	Plains, Coastal and Malnad; Old Mysuru, Hyderabad Karnataka,	2
	5	Bombay Karnataka and present day administrative division	2
	6	[Mysuru, bengaluru, KalyanaKarnataka and Kittur Karnataka]; Political Landscape since Independence	2
	7	Chapter 3. Economic Profile: Developments in Agriculture	2
		Industry and Service Sectors	1
	8	Unit - 2 Social Organisation	

	9	Chapter 4: Religions, Languages, Castes, and Tribes	2
	10	Classes as per latest Census/Sample Surveys	3
May	11	Chapter 5: Education: Growth of STEM Courses,	2
		Status of Social Sciences and Humanities	3
	12	Urbanisation: Trends and Issues	3
		Chapter 6:HDI and Regional Disparities	2
	13	Unit – 3 Social Movements of Karnataka	
	14	Chapter 7: Unification of Karnataka	3
		Save Kannada and Gokak Movements	2
Jun	15	Chapter 8: Environment Movements: Chipko and Appiko	2
	16	Sahyadri Mining Protest, Seabird Naval Base, Movement	3
		Against Social Forestry	1
	17	Chapter 9: Socio-Religious Movements:	2
		Veerashaiva, Non-Brahmin, Dalit Movements	2
July	18	Unit-4 Studies on Karnataka Society	3
		Chapter 10: Contributions of M N Srinivas, Parvathamma, Hiremallurishwaran	5
	19	Chapters 11 and 12: Fieldwork report on Changing Social Institutions	5
		Impact on Social Life	2

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 01

Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore –560 019.

Department of Sociology

Lesson Plan 2023-24

FROM: August to December — Total No.of hrs = 42

Name of the Faculty : Sandhya HR

B.A 3rd semester

DSC :5 paper Social Stratification and Mobility

Month	WEEK	TOPIC OR LESSONS COVERED	Hours
August	1	Unit – 1. Stratification - Features and Forms	42
		Chapter No. 1 Meaning and Definitions of Stratification Basic Characteristics of Stratification.	4
	2	Chapter No.2. Forms of Social Stratification – Meaning- Caste, Class, Estate	3
	3	Chapter No.3. Dimensions of Social Stratification - Income, Wealth,	4
	4	, Power, Occupational Prestige, Schooling	3
September	5	Unit – 2. Perspectives on Stratification	4
		Chapter No. 4 Functional Theory: Kingsley Davis	
	6	Perspective& Critique by Melvin M Tumin.	3
	7	Chapter No.5. Karl Marx's Theory: Class and Social Change	4
October	8	Chapter No.6. Weber's Theory: Class, Status and Power	4
	9	Chapter No 7. Meaning of Social Mobility: Forms of Social Mobility:	3

	10	Horizontal and Vertical, Intergenerational and Intragenerational Mobility	
November	11	Chapter No.8. Role of Education mobility	3
	12	Profession in the Rise of Middle Class	3
	13	Chapter No.9. Mobility in Caste in Contemporary India	3

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore –560 019.

Department of Sociology

Lesson Plan 2023-24

FROM: August to December

Total No.of hrs - 42

Name of the Faculty : Sandhya HR

B.A 3rd semester

DSC -Sociology of Urban Life in India

MONTH	WEEK	TOPIC OR LESSONS COVERED	HOURS
August	1	Unit – 1. Introducing Urban Sociology	3
		Chapter No. 1. Meaning of Urban Sociology and its Importance	
		A brief history of Urban Sociology in India and World	3
September		Chapter No.2. Meaning of Urban, Urbanism	
		The City; Types of City: Metropolitan, Megacity and Global City	3
		Chapter No.3. Urbanization and its Challenge	3
		Meaning of Terms: Rural-Urban Continuum,	3
		, Suburbs, Urban Fringe, Urbar Sprawl, Edge Cities	3
October		Unit – 2. Perspectives on Urban Society	3
		Chapter No. 4. Ecological Theory (Chicago School)	3
		Chapter No.5. World and Global Cities (Saskia Sassen)	3
		Chapter No.6 Spaces of Flows (Manuel Castells), Cities in the South	3
November		Unit – 3. Urban Policy	

		Chapter No.7. Inequalities: Caste, Class,	3
		Gated Communities and Social Exclusion	3
December		Chapter No.8. Urban Governance: 74th Amendment to the Indian Constitution, Urban Development and Planning	3
		Chapter No.9. Urban Policy: Urbanisation and Environmental Concerns, Smart Cities	3

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore –560 019.

Department of Sociology

Lesson Plan 2023-24

FROM: August to November

Total No.ofhrs=56

Name of the Faculty : Sandhya HR

B.A 3rd semester

DSC -9Social Entrepreneurship

MONTH	WEEK	TOPIC OR LESSON COVERED	HOURS
		Unit 1 Fundamentals of Social Entrepreneurship	
AUGUST	1	Chapter 1 Social entrepreneurship: Meaning, Features and Relevance	3
	2	Social Business: Meaning; Difference between Social Entrepreneurship and Social Business;	3
	3	s; Relation between Social Change and Social Entrepreneurship	2
	4	Chapter 2 : Typology of Ventures: Social Purpose Ventures, Social Consequence	3
	5	Entrepreneurship, Hybrid Models of Social Entrepreneurship	2
	6	Chapter 3 : Identifying social business opportunities	2
		Unit 2 Establishment of Non-Profit Organizations	
September	7	Chapter 4Concept of Non-Government Organizations.	3
	8	Chapter 5 ; Objectives and establishment of Non-Profit organizations (NPOs) ; Legal Procedure for establishment of NPOs	3

	9	: Societies Registration Act, Indian Companies Act, Charitable Endowments Act, Foreign Contribution (Regulation) Act (FCRA); Available Tax Reliefs	3
	10	chapter 6 Social Values of NPOs: Mission and Vision; Memorandum of Agreement (MoA) and Bye-Laws	3
		Unit 3 Management and Financing	
	11	Chapter 7 Human Resource Management: Staffing Plan, Social Security of Workers:	3
		Provisions and Benefits of Gratuity Act; Rules and Regulations of EPF Scheme	3
October	12	Chapter 8 Project Management (Definition of Concept; Identification of Project) ;	3
	13	Proposal Development (Basic Factors, Project Proposal Guide; Budget, Rationale for sending Project Proposal to the Donor;	3
	14	; Proposal Writing; Do's and Don'ts of a Project Proposal)	3
	15	Chapter 9 : Financing: Sources of Finance: Government, Donors, International Agencies;	3
	16	Documents Used in Fund Raising; Due Diligence; Campaigns; Internal Income Generation	3
November		Unit 4 Case Studies	
	17	Chapter 10 Pratham, RUDSET and Vivekananda GirijanaKalyana Kendra,	3
	18	Chapters 11 Students should study the functioning of a local NPO, present their ideas in a seminar and submit a report	3
	19	Chapter 12 (For example working in the areas of Sanitation, Rural Development, Women Empowerment)	3

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Scienc
N.R. Colony, Bangalore-560 01

Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore –560 019.

Department of Sociology

Lesson Plan 2023-24

FROM: August to November Total No. of hrs=56

Name of the Faculty : Sandhya HR

B.A 3rd semester

DSC -10 SOCIETY AND TRIBES

MONTH	WEEK	LESSON TOPIC or COVERED	HOURS
AUGUST		Unit – 1 Concepts and Categories	
	1	Chapter 1. Tribes and Indigenous People; Scheduled Tribes, Primitive Tribes, DeNotified or ex-criminal Tribes in India	3
	2	Geographical Distribution of Tribes in India, Tribes of Karnataka	2
	3	Chapter 2. Meaning of: Hadis(Settlements). Rules of Marriage, Clan, Lineage,	3
	4	Consanguinity and Affinity, Male-Female relations	2
SEPTEMBER	5	Chapter 3:Social System, Legal System, Political System	3
	6	, Economic System, Religion and Magic	2
	7	Unit – 2 Changes and Development Issues	
		Chapter 4: Tribes and Caste, Tribe-Caste-Peasant Continuum	3
		Sanskritisation among Tribes	
	8	Chapter 5: Tribalisation, Detribalisation	3

		, Retribalisation	
	9	Chapter 6: Tribal Development and Welfare	3
		: (Policy of Assimilation, Isolation and Integration); Problems of Tribes	
OCTOBER	10	(Exploitation, Land Alienation, Unemployment); Cultural Transformation of Tribes	3
		. Scheduled Areas, Tribal Justice and Modern Law	
	11	Unit – 3 Studying Tribes	
		Chapter 7: Tradition of Fieldwork	3
		History and Significance; Ethics of Fieldwork	
	12	Etic and Emic Perspectives	2
NOVEMBER	13	Chapter 8:Sources of Data: Primary and Secondary	3
	14	Chapter 9: Participatory Method, Case Studies	3
		Sample Surveys, Genealogies	
	15	Unit-4 Field Work	4
	16	Students have to take up field work in any nearby tribal settlement and present their findings in a Seminar and written report	

HOD Signature

Principal

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts & Science

Narasimharaja Colony, Bangalore –560 019.

Department of Sociology

Lesson Plan 2023-24

FROM: August to November Total No. of hrs=56

Name of the Faculty : Sandhya HR

B.A 3rd semester

DSC -11 Statistics in Sociological research

MONTH	WEEK	LESSON or TOPIC COVERED	HOURS
AUGUST	1	Unit 1 Sociological Research	
	2	Chapter 1 Meaning ofScience, SocialaScience, Research, Research Design	3
	3	Chapter 2 Steps for Conducting Research	3
	4	: Choosing Research Topic, Literature Review, Sources of Data (Primary, Secondary)	3
	5	Chapter 3 Meaning of - Concept, Assumption, Hypothesis, Formulating a Hypothesis;	3
	6	; Independent Variable, Dependent Variable; Drawing Conclusion	3
SEPTEMBER	7	Unit 2 Methods of Sociological Research	3
	8	Chapter 4 Qualitative and Quantitative Methods: Meaning, Differences	3
	9	Chapter 5 Survey Methods: Sampling	3
	10	Questionnaire, Interview	3
	11	Chapter 6 Observation: Participant, Nonparticipant Observation	3

OCTOBER	12	Unit 3 Social Statistics	
	13	What is Social Statistics?	3
		Need for Studying Social Statistics	
	14	Chapter 8 Definition of - Population, Sample, Count, Fractions, Constant, Variable	3
	15	Types of Statistics: Descriptive Statistics, Inferential Statistics	2
	16	s Chapter 9 Meaning of Frequency Distribution; Construction of FrequencyTables	3
	17	; Diagrammatic and Graphical Representation of Grouped Data: Advantages	3
	18	Types: Pie Charts, Bar Charts, Histograms, Frequency Curve	2
NOVEMBER		Unit -4 Methods of Statistical Measurement	
	19	Chapter 10 Measures of Central Tendency: Merits, Demerits;	3
	20	Arithmetic Mean: Merits, Demerits; Median and Mode- Merits, Demerits	3
	21	Chapter 11 Measures ofDispersion: Range,	3
	22	Standard Deviation, MeenDeviation, Quartile Deviation	3
	23	Chapter 12 Correlation: Pearson's Correlation, Rank Correlation	3

HOD signature

Principal

PRINCIPAL
APS College of Arts & Scienc
N.R. Colony, Bangalore-560 01

Acharya Pathasala College of Arts and Science
N.R.Colony, Bengaluru-19
Department of Post-Graduate Studies in Economics (M.A)
LESSON PLAN-2023-24: I-Semester

Total no of hrs=60	Paper: Advance Micro Economics-I	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
November 2023	1st week	MODULE I: INTRODUCTORY • Nature and scope of micro economics: Determination of allocation of resources and relative prices. • Positive and normative approaches, Static and dynamics, Partial and general equilibrium, Comparative statics.	15
	2nd Week	MODULE-II CONSUMER BEHAVIOUR AND DEMAND • Nature of consumer behaviour, consumer choice in the cardinal utility analysis, Ordinal theory. • Indifference curve approach, representative consumer, assumptions on consumer's preference, representation of consumer's preference by indifference curves, properties of indifference curves, budget set and budget line- slope of indifference curve and Marginal rate of substitution - Consumer's equilibrium, utility maximization and expenditure minimization.	
	3rd Week	• Marshallian and Hicksian demand functions – Comparative statics: Price and income effects on equilibrium demand – Slutsky's equation	
	4TH Week	• Duality in consumption: Indirect utility function and expenditure function ; • Roy's Identity and Shepherd's Lemma – Consumer's welfare: Concept and measurement of consumer surplus	
	1st week	MODULE-III FIRM'S BEHAVIOUR AND PRODUCTION • Nature and types of cost of production and revenue to a firm – Fixed cost, variable cost, average variable cost, average cost, marginal cost – Total revenue, average revenue and marginal revenue	

December 2023		• Production function - Returns to scale – Elasticity of substitution	
	2nd Week	• Isoquants – Marginal rate of technical substitution • Profit function and cost function – Profit maximization and cost minimization —Input demand functions- Duality in production: Hotelling's Lemma - Functional form and properties of select production functions: Cobb-Douglas, Leontief and Constant Elasticity of substitution – Producer's welfare: Concept and measurement of producer surplus	15
	3rd Week	MODULE-IV: THEORY OF MARKETS IN PARTIAL EQUILIBRIUM Introduction to market structure and types of markets • Market structure - Factor and product markets • Spot, future and forward markets- Perishable and durable markets –Concept of market equilibrium and market disequilibrium.	
	4th Week	Perfect competition • Conditions of perfect competition, demand and supply curve of a firm and industry • Profit maximization – Market equilibrium in short run and long run equilibrium - Properties of market equilibrium – stability and efficiency – Consumer surplus and producer surplus	
	1st Week	Theory of monopoly • Types of monopoly - Price and output determination of a firm/industry • Comparison of price and output between monopoly and perfect competition - Monopoly power- Discriminatory monopoly:	
	2nd Week	• Market segmentation and multi-part pricing, degree of price discrimination • Bilateral monopoly – Consumer surplus and producer surplus – Monopsony	
January 2024	3rd WEEK	Theory of monopolistic competition • Imperfect competition and monopolistic competition - Importance of product differentiation – Market equilibrium in short and long term • Comparison of profit maximization conditions between perfect competition, monopoly and monopolistic competition	15

	4th Week	• Problems of monopolistic industries: Selling costs, sunk costs and excess capacity	
February 2024	1st Week	Theory of Oligopoly • Features of oligopolistic market • collusive and non-collusive oligopoly	15
	2nd Week	• models of non-collusive oligopoly with homogenous products: Price and output determinations under Cournot duopoly and Stackelberg equilibrium –	
	3rd Week	• Models of non-collusive oligopoly with heterogenous products - Kinked demand curve and Bertrand competition.	
	4th Week	• Revision	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science

N.R.Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: I-Semester

Total no of hrs=60	Paper: Macroeconomics I	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
NOVEMBER 2023	3rd week	Module I; Introduction to macroeconomics • Nature and scope of macroeconomics • Review of basic concepts: Aggregate demand and aggregate supply; • National income and general prices;	10
	4th Week	• savings and investment; full employment • Review of macroeconomics methodology	
December 2023	1st week	• static and dynamics – short term and long macroeconomics • macroeconomic equilibrium and disequilibrium- • deterministic and stochastic macro economics	18
	2nd Week	Module II: Short term determination of national income: Demand-side equilibrium • Interest rate in product market; • IS curve and determinants of shifts in IS curve Interest rate in money market:	
	3rd Week	• LM curve and determinants of shifts in LM curve Module III: Macro-Economic Theories of Investment • The Keynesian, • Post-Keynesian, • New-Keynesian and the financial theory of investment determination.	

January 2023	4th Week	• Natural Rate of Unemployment hypothesis- • The short & long run Phillips Curve. Imperfect Information and Inflation expectations	17
	1st Week	Module V: Money, monetary policy and macroeconomic stabilization • The Demand for Money; • The classical, Keynesian and Post Keynesian theories of demand for money- Patinkin and Real Balance Effect;	
	2nd Week	• Baumol, Tobin; • Friedman and the Modern Quantity Theory –	
	3rd WEEK	• Monetary policy: Objectives, instruments and stabilization Module VI: Fiscal policy and macroeconomic stabilization • Nature and scope of fiscal policy –	
	4th Week	• Concept and definition of fiscal stabilisation – • Instrument of fiscal policy:	
February 2023	1st Week	• Taxation, • expenditure and debt –	15
	2nd Week	• Fiscal stimulus and stabilisation • Fiscal deficit and stabilisation – • Crowding-out effect – • Ricardian Equivalence Theorem	
	3rd Week	• Lags in investment- Portfolio disequilibrium and the transmission mechanism. Module IV: Theories of Inflation • Theories of Inflation- Structural and Monetarist Approaches to Inflation;	
March 2024	1st & 2nd week	• Revision	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: I-Semester

Month	Week	Topics to be covered	No. of hours
NOV-2023	3rd week	**Module 1: Introduction: Need for mathematical methods in economics** • Need for mathematical approach in economics • Nature and scope of mathematical methods and economics • Role of economic theory in mathematical economics • Difference between mathematical, statistical and econometric methods	10
	4th Week	**Module 2: Number system and analytic geometry** • Number system: Integers, Real Numbers and Real Number Line Functions: Continuous and discontinuous; Linear and non-linear - Cartesian coordinates: Plane, distance and angle – Area under a linear and non-linear curves • Calculation of triangle, Rectangle and trapezoid • Applications to measurement of consumer surplus, producer surplus, deadweight loss, profits and Lorenz curve	
DEC - 2023	1st Week	**Module 3: Linear algebra** • System of linear equations • Simple market equilibrium model and determination of equilibrium demand, supply and price	
	2nd Week	• Introduction to matrix algebra: Types and properties matrices • Solution to system of linear equation using Cramer Rule • Application to determination of equilibrium output and stability in Leontief's Input-Output Model	
	3rd week	**Module 4: Calculus** • Derivative of a function: Total and partial derivatives • Rules of differentiation • Application to find the slope of a curve: utility, cost and revenue curves; price and income elasticity of demand; growth rate of a variable.	18

	4TH Week	• Static optimisation - Formulation of objective functions and constraints for maximization and minimization - • Lagrangean function and multiplier method - First order and Second order conditions Applications of optimization to determine utility and profit maximisation and expenditure and cost minimization.	
JAN - 2024	1st Week	• Integral of a function - Types and rules of integration Determination of area under a curve • Relationship between integration and differentiation • Application to measurement of consumer surplus, producer surplus and deadweight loss. • Linear approximations to a non-linear equation: Taylor Theorem	
	2nd Week	**Module 5: Dynamic analysis** • Linear difference and differential equations • Types and properties of linear differential equations	17
	3rd Week	• Solution to a differential equation, Application to determination of the Marshallian and Walrasian stability	
	4th Week	• Introduction to dynamic optimisation - Overview of methods of Calculation of Variation and Optimal Control, Euler Equation - Broad areas of application of dynamic optimisation	
FEB - 2024	1st WEEK	**Module 6: Game theory** • Strategic behavior and game theory in economics- • Basic concepts; Cooperative and non- cooperative games, pure strategy and	
	2nd Week	• mixed strategies, extensive and normal form games, two- person and n-Person games - Zero-sum, Two- Person game, Maximin and Minimax strategies - Equilibrium (saddle) point- Concept of Core, Application of basic game theory to duopoly theory: Nash equilibrium	
	3rd Week	**Module 7: Linear programming** • Scope of linear programming - optimization of a linear function with inequality constraints – • Primal and dual problem – • Importance of Simplex Method – • Data Envelope Analysis and its application in production	15

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: I-Semester

Month	Week	Topics of Lesson covered	No. of Hours
NOV - 2023	3rd week	**Module 1: Changes in the Indian Economy: Overview** • Indian economy on the eve of India's independence - • Historical trends in Indian economy - Recent transformation and performance of the economy since 1991.	
	4th Week	• Trends in GDP by aggregate and sectors- agriculture, industry, and services. Development strategy after independence	10
DEC-2023	1st Week	• Five-year Plans and National Economic Reforms- Planning	
	2nd Week	• Commission and Niti Aayog - Objectives, strategy, achievements and failures	
	3rd week	**Module 2: Growth of Indian agriculture** • Indian Agriculture sector- growth in agriculture and Index of Agricultural Production	18
	4TH Week	• Changes in the land system, land tenure system and land reforms in the post-independence era, - • Green revolution and capital formation in agriculture, Food security and public distribution system, Indian agriculture and WTO	
JAN - 2024	1st Week	**Module 3: Distributional issues in Indian economy** • Challenges of development: Trends in poverty, and inequality • Education and unemployment Poverty alleviation and Employment Generation Programs. MGNREGP • Health and Nutrition policies, Education policy- • financing of health and education in India	
	2nd Week	**Module 4: Industrial sector** • Industrial policy reforms - New Industrial Policy 1991, MSMEs. • SSIs and Cottage industries and their importance. Public and Private Sector and their	17
	3rd Week	• Performance, Privatization and disinvestments: recent trends of growth and maturing of Indian industry. Rise in Service Sector-	
	4th Week	• IT sector in India. Role of FDI and MNC's in industrial development, Globalization of Indian economy	

FEB - 2024	1st WEEK	**Module 5: Infrastructure** • Infrastructural development - reforms: restructuring, pricing and • regulation, changing trends in Rural and Urban Infrastructure. Promotion strategy towards investment in infrastructure - Public-private partnership Model (Build-Operate-Transfer (BOT), Build-Own- Operate-Transfer (BOOT), • Design-Build-Finance-Operate (DBFO) and Build-Own-Operate (BOO)), Inter-sectoral issues	
	2nd Week	• energy, transport, telecom, Environmental Protection policies in infrastructural development. **Module 6: India's achievements in global economy** • India's ranking in UNDP HDI, Global Competitiveness Index-	
	3rd Week	• India's position in World Bank's classification of countries by income levels, India's position in attainment of MDG (Millennium development goals), & SDG (Sustainable development goals).	15

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: I-Semester

Month	Week	Topics to be Covered	Hours
NOV - 2023	3rd week	**MODULE I-EARLY ECONOMIC THOUGHT** • Nature and significance of the history of economic thought. Early thought.	
	4th Week	• mercantilism, the Physiocrates and social philosophy, Natural order and the circulation of wealth, Laissez Faire	10
DEC-2023	1st Week	**MODULE II - CLASSICAL POLITICAL PHILOSOPHY** • Smith- naturalism, optimism, Theory of moral sentiments, value and distribution. The pessimists- Malthus and Ricardo, Theory of diminishing returns and rent	
	2nd Week	• Theory of exchange value and relative prices. Distribution of income. Economic ideas of Jean-Baptiste Say, John Stuart Mill and Nassau William Senior	18
	3rd week	**MODULE III - THE SOCIALISTS OF THE EARLY NINETEENTH CENTURY** • Critique of capitalism- The antagonists thought - Charles Fourier - Simonde De Sismondi - Robert Owen	
	4TH Week	• Origin of German Historical School Rise of socialist thought- economic ideas	
JAN - 2024	1st Week	• the Utopians- State socialism, revolutionary socialism-Marx's, assessment of Marx's Economics	
	2nd Week	**MODULE IV - RECONSTRUCTION OF ECONOMIC SCIENCE** • Subjectivism and marginalism. Developments in the marginal utility concept.	
	3rd Week	• Fully developed subjectivism-economic ideas of the Austrian school • Hedonist school, Lausanne mathematical school, Swedish school.	
	4th Week	• Neo classical Orthodoxy Marshall • competition and equilibrium	17
FEB-2024	1st WEEK	**MODULE V-NEW ECONOMIC THOUGHT** • Keynes-General theory-	
	2nd Week	• Keynesian revolution and the monetarist counter revolution. Heterodoxy economics – • feminist economics and ecological economics	15

	3rd Week	• Revision	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature 27/9/24

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 01

Acharya Pathasala College of Arts and Science
N.R.Colony, Bengaluru-19
Department of Post-Graduate Studies in Economics (M.A)
LESSON PLAN-2023-24: III-Semester

Total no of hrs=60	Paper: PUBLIC ECONOMICS	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
May 2024	1st week	**Module I: Role of Government** • Role of State- a historical evolution, Economic rationale of the Modern State: • Market Failure and the Rationale for Government Intervention;	15
	2nd Week	• Natural Monopolies; Asymmetric Information; • The Problem of Externalities and their Internalization - Government failure. **Module II: Theory of Public Goods and Public Choice** • Concepts, Characteristics of Public Goods: Economic analysis of Public Goods, Efficient Provision of public good;	
	3rd Week	• Partial Equilibrium Analysis, Optimal Provision of Public Good; • General Equilibrium Analysis. Merit goods, Impure Public Goods and The Theory of Clubs: • Buchanan Model-Tiebout Model	
	4th Week	• Common property Resources; Tragedy of the commons. • Public Choice theory: Problem of Collective Choice Defined, Majority Voting, An economic Theory of politics.	

June 2024	1st week	**Module III: Fiscal Policy Instruments** • Fiscal policy for Stabilization; Classical and Keynesian - Principles of Taxation: Benefit and ability to pay approaches; • Theory of Tax incidence; Theory of optimal Taxation; • Trade-off between equity and efficiency; Theory and measurement of dead weight losses- The Problem of Double Taxation	15
	2nd Week	• Theoretical and Empirical Analysis of Public Expenditure; • Pure Theories of Public Expenditure, Positive, applied and normative aspects of public expenditure- Wagner and Wiseman • Peacock Hypothesis and their current relevance. Criteria of public Investment;	
	3rd Week	• Social cost- benefit analysis- Public Expenditure Management & Control: Concepts. • Theories of Public debt: classical and Compensatory views; Sources of Public debt,	
	4th Week	• Burden of Public Debt; Principles of Management and Repayment. - Intergenerational issues and debt sustainability **Module IV: Fiscal Federalism: Theory and Practice** • Principles of Federal (Multi Unit) Finance: Imbalances in Federal finance, Vertical and horizontal imbalance; • Fiscal federalism in India-	
July 2024	1st Week	• Transfer mechanisms- Finance Commissions and their impacts, Constitutional Assignment of State - Local finance in India:	15
	2nd Week	• Issues in Fiscal Decentralisation in India in the context of 73rd and 74th constitutional amendments. • State Finance Commissions	
	3rd WEEK	Module V: Indian Public Finance: Current Scenario • Public budgeting- concepts, principles, practices and reforms. • Debates on Fiscal Consolidation and policy measures in India	

	4th Week	• Revenue, Fiscal and Primary Deficits; • Fiscal Responsibility and Budget Management Act- Budget Analysis	
August 2024	1st Week	• Indian Tax System: An Assessment; • Tax and non- Tax Revenue of the Union,	15
	2nd Week	• States and local bodies; • VAT, • CENVAT,	
	3rd Week	• Design and implementation of Goods and Services Tax (GST), • Tax administration and implementation Issues in Tax reforms in India. - Structure, Trends and Pattern of Public Expenditure in India- Public debt in India: liabilities, Growth and Problem	
	4th Week	• Revision	

HOD Signature

H.O.D/Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science

N.R.Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: III-Semester

Total no of hrs=60	Paper: INTERNATIONAL ECONOMICS	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
November 2023	3rd week	Module 1: New Trade Theories: Salient Features • Neo-technological trade theories- Kravis theory of Availability, • Linder's theory of Volume of Trade and Demand pattern, • Posner's Imitation gap	10
	4th Week	• Vernon's Product Cycle Theory.Intra • Industry Trade Models- Krugman's Model (1979), • Brander-Krugman Model (1983). • Empirical work on Intra-Industry trade-	
December 2023	1st week	• Strategic Trade Theory Models: Krugman's Model (1984), • Brander and Spencer's Model (1985)- • Neo –Heckscher –Ohlin Theory, • Monopolistic Competition and International trade, Oligopoly and International trade.	15
	2nd Week	Module II: Trade in Services • Emerging pattern of services trade- • The scope and potential of Services trade in Developing Countries-	
	3rd Week	• GATS.Trade in Factors of Production and in Intermediate Good- Capital inflow and welfare- • Emigration versus capital inflow- Fragmentation, Outsourcing and trade. Traded vs non-traded goods.	
	4th Week	Module III: New Protectionism • The political economy of protectionism- • Non-tariff barriers	
	1st Week	• Voluntary Export restraints and • Import Expansion- Subsidies, Administered and Contingent Protection and fair trade: • Dumping and Antidumping- Countervailing duty, Safeguard actions-Neo Protectionism.	

January 2023	2nd Week	Module IV: Economic Integration • Types of integration-Customs union:	15
	3rd WEEK	• Partial equilibrium analysis • general equilibrium analysis-Trade creation and Trade diversion-	
	4th Week	• Free trade areas, • Emerging issues in SAFTA, • ASEAN and EU.	
February 2023	1st Week	Module V: Trade and Development. • Terms of Trade and UDCs • Theory of Immiserising growth	15
	2nd Week	• Technical progress and trade • Global and National scenario	
	3rd Week	• Dutch disease-Rybenzynski theorem • Structural changes in trade and Economic development	
	4th week	• Revision	
March 2024	1st and 2nd week	• Previous year question paper discussion • Competitive exam related economics discussion.	05

HOD Signature

H.O.D & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: III-Semester

Month	Week	Topics to be covered	Hours
NOV - 2023	3rd week	**Module 1: Introduction to Econometrics** • The concept of economic models: differences between economics & econometric models	10
	4th Week	• definition & scope of econometrics, econometrics & mathematical economics, econometrics	
	1st Week	• statistics, goals of econometrics, division of econometrics, methodology of econometric research-	
	2nd Week	• Specification, estimation, evaluation & forecasting the power of the econometric models	
DEC - 2023	3rd week	**Module 2: Correlation** • Correlation-theory & its limitation; types of correlation, interpretation, probable error • Rank correlation, categorical correlation,	18
	4TH Week	• correlation model-linear & nonlinear • interpretation, cause & effect relationship & auto correlation	
JAN - 2024	1st Week	**Module 3: Simple Linear Regression Model** • Concept of Regression - Estimation - Ordinary Least Square Method - Assumptions of OLS	
	2nd Week	• Properties of OLS estimator - Gauss-Markov Theorem - Hypothesis Testing - Normality	
	3rd Week	• assumption for error term - t-test for individual regression coefficient - Analysis of Variance Prediction - Mean and individual prediction	17
	4th Week	**Module 4: Multiple Linear Regression Model** • Estimation - Assumptions and Properties, Analysis of Variance - R-squared - Hypothesis Testing - Individual and overall model significance. • t and F test	
FEB - 2024	1st WEEK	**Module 5: Relaxing Assumptions of Classical Regression** • Heteroscedasticity - Meaning and consequences for OLS estimator - Tests for heteroscedasticity	15
	2nd Week	• Remedial measures - Multicollinearity - Meaning and Consequences for OLS estimator, Tests for Multicollinearity, Remedial measures - Autocorrelation	

	3rd Week	Meaning and consequences for OLS estimator, Tests for autocorrelation, Remedial measures -Specification errors	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: III-Semester

Month	Week	Topic to be covered	Hours
NOV - 2023	3rd week	**Module - I: Welfare Economics and Environment** • Welfare economics and Environment: Pareto optimality and competitive equilibrium	10
	4th Week	• Fundamental theorems of welfare economics; Externalities and market inefficiency. Economic activity and environment quality	
DEC - 2023	1st Week	• Interactions and trade-offs: Roots of environmental degradation • Consumers and producer's surplus. Market and government failure and environment degradation	
	2nd Week	**Module - II: Measurements of environmental values** • Measurements of environmental values - use values: option values and non-use values;	
	3rd week	• valuation methods - methods based on observed market behaviour; hedonic property values and household production models (travel cost method and household health production function.	18
	4TH Week	• Methods based on response to hypothetical markets, contingent valuation methods	
JAN - 2024	1st Week	**Module - III: The Theory of Environmental Policy** • Environmental externalities - Pigouvian taxes and subsidies, marketable pollution permits	
	2nd Week	• and mixed instruments (the charges and standards approach). Coase's bargaining solution and • collective action; Informal regulation and the new mode' of pollution control, Monitoring and enforcement of environmental regulation,	
	3rd Week	• Environmental institutions and grass root, movements; Global environmental externalities and climatic change • Tradable pollution permits and international carbon tax, Trade and environment in WTO regime	17
	4th Week	**Module IV: Economics of Natural Resource Management and Sustainable Development** • Theories of optimal use of exhaustible and renewable resources • Environmental and development trade off and the concept of sustainable development	
FEB -	1st WEEK	• Integrated environmental and economic accounting and the measurement of environmentally corrected GDP • Macroeconomic policies and environment	

2024	2nd Week	**Module V: Environmental and Natural Resource Problems in India** • Mechanism for environment regulation in India; Environmental laws and their implementation • Policy instruments for controlling water and air pollution and forestry policy;	15
	3rd Week	• People's participation in the management of common and forest lands, The institutions joint forest management and the joint protected area management, social forestry -rationale and benefits	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: III-Semester

Total no of hrs.=60		**Paper: New Social Movements in India (O.E)**	**Name of the faculty: Chandramouleshwara M**
Month	**Weeks**	**Topics or Lessons covered**	**Hours**
NOV - 2023	3rd week	**Module - I: Social Movements – Introduction and Meaning**	10
	4th Week	• Characteristics of Social Movements	
DEC - 2023	1st Week	• Old social Movements – Characteristics and detailed Discussion	18
	2nd Week	• New social Movements – Characteristics and detailed Discussion	
	3rd week	**Module - II: History of Social Movements in India**	
	4TH Week	• Introduction to Social Movements in India	
JAN - 2024	1st Week	• Interface between National Movements and social Movements, Trible, Peasant Struggles.	17
	2nd Week	**Module – III: New Social Movements after 1980** • Emergence of new social movements after 1980s – its nature and characteristics.	
	3rd Week	• Farmers and Dalit's Struggles	
	4th Week	• Tribal Struggles in India • LGBT, Peace Struggles	
FEB - 2024	1st WEEK	• Environmental Struggles	15
	2nd Week	**Module IV: Critique of New Social Movements**	
	3rd Week	• Social Movements and Globalization	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R.Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24 II-Semester

Total no of hrs=60	Paper: Advance Micro Economics-II	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
May 2024	1st week	**Model 1: Welfare Economics** • Nature and scope of welfare economics • Measurement of individual welfare: Consumer surplus, Compensating Variation and Equivalent Variation – Contingent valuation method for welfare measurement -	15
	2nd Week	• Measurement of social welfare – Arrow's Impossibility Theorem - Social welfare functions: • Samuelson-Bergson, • Utilitarian/ Benthamite and Rawlsian social welfare functions: • Functional forms and properties of social welfare functions.	
	3rd Week	**Module 2: General equilibrium** • Walrasian general equilibrium – Determination of relative prices – Walras Law – • Properties of equilibrium: Efficiency and Stability	
	4TH Week	• Efficient allocation and Pareto optimality in a pure exchange economy – Fundamental theorems of welfare economics	

June 2024	3rd week	• Breakdown of efficiency allocation conditions: Externality, public goods and theory of second best – • Walrasian, Marshallian and Hicksian stability conditions -	
	2nd Week	• Introduction to non-Walrasian general equilibrium - Role of non-market clearing conditions – • Comparison between Walrasian and Non-Walrasian equilibria – Implications for Reappraisal models in macroeconomics.	
	3rd Week	**Model 3: Risk and uncertainty** • Concept of risk and uncertainty –Relationship between risk and uncertainty – • Degree of risk and its determination	15
	4th Week	• Consumer behaviour under uncertainty – • Method of expected utility – Risk behaviour of consumers:	
	1st Week	• Risk aversion and risk premium, risk preference and risk neutrality • Neumann and Morgenstern theory of expected utility maximization	
	2nd Week	• Investment behaviour under uncertainty – Expected net present value criterion • Discount rate	
July 2024	3rd WEEK	**Model 4: Economics of Information** • Information structure in microeconomic models	15
	4th Week	• Perfect, Imperfect and Asymmetric Information	

August 2024	1st Week	• Theory of asymmetric quality information and adverse selection:	15
	2nd Week	• The Market for Lemons • Asymmetric information and signals	
	3rd Week	• . Asymmetric information and moral hazard • Theory of auctions - Types of auctions – Price determination by types of auctions	
	4th Week	• Revision	

HOD Signature

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science
N.R.Colony, Bengaluru-19
Department of Post-Graduate Studies in Economics (M.A)
LESSON PLAN-2023-24: II-Semester

Total no of hrs=60		Paper: Advance Macro Economics-II	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
May 2024	1st week	**Module 1: Open Macroeconomic Models** • Features of an open macro economy: Trade, capital mobility and exchange rates– • Fixed and flexible exchange rates	15
	2nd Week	• Balance of payments: Current and capital account – • Open economy and IS-LM framework – Trade and IS curve - Capital mobility and LM curve – • Mundell-Fleming Model with perfect capital mobility under fixed and flexible exchange rates;	
	3rd Week	• Monetary expansion and exchange rates; Beggar-Thy Neighbour policy and competitive depreciation	
	4TH Week	**Module 2: New Classical Revolution Introduction** • Nature and scope of New Classical Revolution in macroeconomics – Difference between New Classical Revolution and Keynesian approach to aggregate supply and demand analyses	
	1st week	**Rational Expectations Model** • Nature and scope of Rational Expectations – Early contributions: John Muth,	

June 2024		• Thomas Sargent, Neil Wallace and Robert Barro - Robert E Lucas model – A simple aggregate supply-demand model with exogenous expectations: • Forecasting and Lucas critique – A perfect foresight model with endogenous expectations –	
	2nd Week	• A rational expectations model – Equilibrium and forecast errors under rational expectations – • Imperfect information Model of Aggregate Supply Curve - Comparison of equilibrium price and output under different models	15
	3rd Week	**Random Walk Theory** • Random Walk of macroeconomic variables – Trend or secular component and cyclical component of output changes – • Detrending data and Stationary process – Random Walk Theory of GDP – Trends and shocks – Effects of shocks, Permanent and transitory – Concepts of trend stationary, difference stationary and trend stationary with breaks – Random Walk of Stock Prices	
	4th Week	**Real Business Cycle Theory** • Nature and scope of real business cycle theory – • Formulation of equilibrium real business cycle model – specification of parameters, calibrations and propagation mechanisms – Microeconomic foundations for macroeconomic real business cycle theory	
	1st Week	**Model 3:New Keynesian Models of Price Stickiness** • Main features of New Keynesian counterrevolution – Unique differences between New Keynesian and New Classists approach to aggregate demand and supply analyses	
	2nd Week	• Concept of sticky prices under imperfect competition • Mankiw's model of price stickiness	
July 2024	3rd WEEK	**Module 4: Theory of Economic Growth** • Concept, definition and measurement of economic growth – • Nature and scope of growth theory. Aggregate and disaggregate; Static and dynamic; Equilibrium and disequilibriu	15
	4th Week	• Approaches to growth theory Keynesian (Kaldor), • Structural macroeconomics (Lance Taylor) and Neoclassical • Harrod-Domar Model: Multiplier-accelerator and production function versions;	

August 2024	1st Week	• Determinants of long run equilibrium growth of national income; Natural growth rate and warranted growth rate • Solow's model: Basic model: Neoclassical production function and its properties: Output per worker and capital- • output ratio Solution to the basic model: Long run determinants of capitaloutput ratio and output per worker –	15
	2nd Week	• Equilibrium growth – Steady state – Transitional dynamics – Covergence debate: Absolute and conditional convergence; • Speed of covergence - Technical progress - Golden Rule of Capital Accumulation – Growth Accounting – • Solow's residual and total factor productivity	
	3rd Week	• Endogenous growth model: Source of endogenous growth – Need for sources of endogenous growth – • Types of endogenous growth models – • AK Model of endogenous growth – Comparison between Solow's model and AK Model of endogenous growth in terms of determinants of growth	
	4th Week	• Revision	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: II-Semester

Month	Week	Topic	No. of Hours
May 2024	1st week	**Module 1: Introduction** • Nature and scope of statistics in economics - Economic statistics and computational statistics - Statistical methods and econometrics	15
	2nd Week	• Types of variables: Univariate and multivariate; random and non-random; continuous and discrete - Types of data: cross section, time series and panel data; sample survey and census data	
	3rd Week	**Module 2: Descriptive statistics** • Objectives of data descriptions - Graphical methods - Measures of central tendency (mean, median and mode) -	
	4th Week	• Measures of dispersion (range, standard deviation, variance, coefficient of variation, interquartile range, mean deviation, skewness and kurtosis)-	
June 2024	1st week	• Measures of linear association between variables (covariance; simple, partial and multiple correlation coefficient; rank correlation coefficient)	15
	2nd Week	**Module 3: Probability and random variables** • Concept of probability - Theorems on probability - Conditional probability and its Theorems- • Random variable: Continuous and discrete - Probability distribution of random variables: Mean, variance, covariance and correlation coefficient of random variables -	
	3rd Week	• Joint distribution of random variables and independence of random variables– Conditional distribution of random variables	
	4th Week	• Select probability density and distribution functions of discrete random variables: Binomial and Poisson distributions -	

	1st Week	• Select probability density and distribution functions of continuous random variables: Normal, Bivariate Normal, Uniform, Chi-square, Student's t, and F distributions - Central Limit Theorem	15
July 2024	2nd Week	**Module 3: sampling theory** • Concept of population and sample - Population parameters and sample statistics - Statistical inference - Definition of sampling - Sampling with and without replacement -	
	3rd Week	• Random and non- random sampling- Types of random sampling: Simple, systematic and stratified- • Sampling distributions of mean and variance - Sampling from normally and non-normally distributed populations	
	4th Week	• Standard error of sample statistics - Frequency distributions: relative frequency distributions and empirical probability distributions	
August 2024	1st Week	**Module 5: Theory of estimation and tests of hypotheses** • Statistical estimation: Estimate, estimator and estimation-Biased and unbiased estimator • Point estimate and interval estimates - Confidence intervals - Confidence interval for means and variances in small and large samples • Statistical hypotheses - Null and alternative hypotheses - Type I and Type II errors – Power of a test • Tests of hypotheses and significance - Level of significance - Tests based on sampling from Normal distribution - One-tailed and two-tailed tests - Tests for sampling distribution of means and variances in small and large samples	15
	2nd Week	**Module 6: Techniques of multivariate analysis** • Nature of multivariate data in economics -Organization of multivariate data using matrix methods - Techniques of multivariate analysis - (a) Discriminant analysis: Two groups analysis; Fisher's	
	3rd Week	• Discriminant Function; Mahala Nobis's D2; Significance testing: Hotelling's R2 statistic -	
	4th Week	• (b) Canonical correlation analysis: Calculation of correlation matrix; Stewart and Love's Redundancy Measure. • c) Factor analysis and Principal Component Analysis: Components from correlation matrix; Components scores and loadings; Bartlett's Sphericity Test; Factor rotation. • Cluster analysis	

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: II-Semester

May 2024	1st week	**Module 1: Nature and scope of agricultural economics** • Definition and scope of agricultural economics- Need for special techniques of economic analysis to deal with unique problems of agricultural economy	15
	2nd Week	• Seasonality, perishability and heterogeneity of output - Role of agriculture in economic growth and development Structural changes and agriculture	
	3rd Week	• Changes in share of agricultural employment and GDP, Organisation of agricultural production -	
	4th Week	• Role of Land, Labour, Capital and entrepreneurship - • Farm Management concept and its significance in modern farming	
June 2024	1st week	**Module 2: Theory of agricultural growth and development** • Transformation of traditional agriculture - Contribution of Mellor, Dale Jorgenson and Schultz. Models of agricultural location	15
	2nd Week	• Backward bending supply curve and Cobweb model - Malthusian and Boserup theories - • Inter-sectoral growth models and agriculture - Dual economy models	
	3rd Week	• Fei-Ranis, Arthur Lewis - Leontief's input-output model and agriculture: Backward and forward linkages - • Construction of Index of Agricultural Production	
	4th Week	**Module 3: yield and Productivity in agricultural** • Measures of agricultural yield - Productivity: Wages and labour productivity and total factor productivity-	

July 2024	1st Week	• Relationship between farm size, yield and productivity	
	2nd Week	• Empirical models of labour productivity and total factor productivity in agriculture	
	3rd Week	**Module 4: Determination of agricultural prices** • Cost of production or input-based approach - Wholesale and retail prices -	
	4th Week	• Risk and uncertainty in agricultural output and prices: Types and measures of instability in agriculture	15
August 2024	1st Week	• Need and instruments of price stabilization: Minimum Support Prices and procurements and Buffer Stocks	
	2nd Week	**Module 5: Agriculture and global economy** • Share of agricultural products in global trade	
	3rd Week	• . Terms of trade of agriculture products - Competitiveness of agricultural exports -	
	4th Week	• WTO and agriculture; Agreement on Agriculture, issues of subsidies-trade distorting and nontrade distorting subsidies - Globalization of agricultural trade	15

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: II-Semester

May 2024	1st week	• **Block-1: Introduction:**	15
	2ndWeek	• Preamble - Philosophy of Constitution of India	
	3rd Week	• Party System in India and Electrol Reforms	
	4th Week	• Political participation and mobilization	
June 2024	1st week	• **Block-II: Institutional Base**	15
	2nd Week	• Parliament - Changing Profile and Law-making procedure	
	3rd Week	• Changing role of Executive	
	4th Week	• Judicial Activism and PIL	
July 2024	1st Week	• **Block-III: Major Issues**	15
	2nd Week	• Communalism and Secularism Debate	
	3rd Week	• Social Movements in India	
	4th Week	• Development and Environment	

August 2024	1st Week	• **Block-IV: International Dimension**	15
	2nd Week	• India's Foreign Policy	
	3rd Week	• . Environment Protection and Climate change policy	
	4th Week	• India's stand on Arms Controls and Disarmaments	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R.Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: IV-Semester

Total no of hrs=60	Paper: DEVELOPMENT ECONOMICS	Name of the faculty: Vishalakshi Malathesha Naykar

Month	Weeks	Topics or Lessons covered	Hours
November 2023	3rd week	Module I: Development and Underdevelopment • Concepts of Development and Sustainable Developmen • Determinants Measuring Development: • conceptual modifications -Income Measures, Basic Needs Approach, • PQLI and HDI and Capabilities Approach;	10
	4th Week	• Growth and Distributive JusticePoverty, • Inequality and Development: Measurement, Alternative Measures-Impact and Policy options; • Development Gap; the Inverted U-hypothesis Module II: Economic Growth • Factors affecting Economic Growth: capital, labour and technology;	
December 2023	1st week	• Historical Perspective of Economic Growth and its relevance; • Structural Diversity and common characteristics of Developing nations	18
	2nd Week	Module III: Theories of Economic Development • Theories of development – classical theory of development, • Karl Marx's theory of development, • Schumpeter's theory of innovation, • W.W. Rostow's stages of economic development, • balanced and unbalanced growth models, • Big Push theory.	
	3rd Week	• Theory of Technical Dualism, Myrdal's circular causation, Unlimited supply of labour • Lewis model; Ranis – Fei model, Leibenstein critical minimum effort, • Nelson's low-level equilibrium trap, Kremer's O-ring theory of economic development.	
	4th Week	Module IV: Growth Models and New Growth Theories • Harrod and Domar: Instability of equilibrium; • Neo Classical Growth Models: Solow and Meade; Growth Models of Joan Robinson, Kaldor and Pasinetti.- Policy Implications	

January 2023	1st Week	• Endogenous Growth Theory: Learning by Doing and • Production Function Approach to Development-	17
	2nd Week	• Total Factor Productivity and Growth Accounting-Role of learning, education and research; • Accumulation of Human Capital; Explanation of Cross-Country Differentials in Economic Growth	
	3rd WEEK	Module-V: The Political Institutions, State & Performance • Role of Institutions in Economic Development • Changing Roles of State and Market;	
	4th Week	• Neoliberal state-Issues in Governance-alternative institutional trajectories and their relationship with economic performance;	
February 2023	1st Week	• state ownership and regulation;	15
	2nd Week	• Rent seeking and parallel economy government failures and corruption	
	3rd Week	• within-country differences in the functioning of state institutions;	
	4th Week	• revision classes.	
March 2024	1st week	• previous year question paper discussion and answer writing classes.	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

Acharya Pathasala College of Arts and Science
N.R.Colony, Bengaluru-19
Department of Post-Graduate Studies in Economics (M.A)
LESSON PLAN-2023-24: IV-Semester

Total no of hrs=60		Paper: Economic Demography	Name of the faculty: Vishalakshi Malathesha Naykar
Month	**Weeks**	**Topics or Lessons covered**	**Hours**
may 2024	1st week	**Module 1: Population and Development** • Meaning and scope of demography; • Components of population growth and their interdependence;	15
	2nd Week	• Measures of population change; Structure, distribution and sources of population data; • Theories of population — Malthus, Optimum theory of population;	
	3rd Week	• Theory of demographic transition —Views of Medows, Enke and Simon; Population and development	
	4TH Week	**Module – II: Structure of Population** • Population trends in the 20th century. • International aspects of population growth and distribution, population and environment.	
	1st week	• Pattern of age and sex structure in developed and developing countries. • Determinants of age and sex structure; demographic effects of sex and age structure, economic and social implications.	

June 2024	2nd Week	• Age pyramids and projections.	15
	3rd Week	**Module – III: Fertility, Nuptiality and Mortality** • Fertility – basic measures, • TFR, • GRR,	
	4th Week	• NRR; levels, trends and determinants; • Nuptiality — Concept and analysis of marital status, single mean age at marriage;	
July 2024	1st Week	• Death rates, crude and age-specific; • IMR, MMR, levels, trends and determinants;	15
	2nd Week	• life tables – construction and uses: concept of stable population projection. **Module – IV: Migration and Urbanization** • Concept and types — Temporary, internal and international;	
	3rd WEEK	• International migration — its effect on population growth and pattern, • Factors affecting migration,	
	4th Week	• Theories of migration related to internal migration; • Urbanization — Growth and distribution of rural-urban population in developed and developing countries.	
August 2024	1st Week	**Module – V Population Policy in India** • Evolution of population policy in India — the shift in policy from population control to family welfare, to women empowerment; • Family planning strategies and their outcomes;	

	2nd Week	• Reproductive health, maternal nutrition and child health policies; • Population and strategies for human development of different social groups;	15
	3rd Week	• Social impact of new reproductive technologies and their regulation; • The population policy 2000; • UN World Population Prospects (revision 2015) and estimated population of India	
	4th Week	• Revision	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 01

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: IV-Semester

May 2024	1st week	**Module I: Special problem in Single Equation Regression Model** • Errors in variables - Method of instrumental variables	15
	2nd Week	• Distributed-lag models: specification, estimation and causality - Dummy variables	
	3rd Week	• Limited dependent variables - LPM, Logit, Probit and Tobit models	
	4th Week	• Generalised, restricted and non-linear least squares estimations	
June 2024	1st week	**Module II: Time Series Analysis** • Time Series Data: Nature, Examples,	15
	2nd Week	• Functional Forms, Trends and Seasonality.	
	3rd Week	• Stationery and Unit Root Test, approaches to economic forecasting	
	4th Week	• AR, MA, ARIMA	
July 2024	1st Week	**Module III: Introduction to Panel Data** • Simple Panel Data Methods - Pooling independent cross sections across time	
	2nd Week	• Policy analysis with pooled cross sections - Two period panel data analysis. Estimation of Panel data	

	3rd Week	• random effects approach and fixed effects approach	15
	4th Week	**Module IV: Simultaneous Equation Approach** • Simultaneous equations model - Example	
August 2024	1st Week	• Identification problems: under, exact and over tests of simultaneity and order erogeneity -	15
	2nd Week	• Methods of estimation - ILS, 2SLS, LIML, K Class • Estimators, Simulation and Monte-Carlo Studies	
	3rd Week	**Module V: Application of Econometrics** • Demand-Supply, Keynesian income determination, Models, etc.	
	4th Week	• Wage-price, Recursive and IS-LM	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

Acharya Pathasala College of Arts and Science

N.R. Colony, Bengaluru-19

Department of Post-Graduate Studies in Economics (M.A)

LESSON PLAN-2023-24: IV-Semester

[illegible]	[illegible]	[illegible]	[illegible]
May 2024	1st week	• **Module- I: Introduction to Economics of Infrastructure** - Infrastructure and economic development	15
	2nd Week	• infrastructure as a public good; Social and physical infrastructure	
	3rd Week	• Special characteristics of public utilities; The peak-load, off-load problem, dual principal controversy, economics of scale of joint supply; marginal cost pricing vs.	
	4th Week	• Other methods of pricing in public utilities; cross - subsidization - free prices, equity and efficiency	
June 2024	1st week	• **Module-II: Transport Economics** • The structure of transport costs and location of economic activities. Demand for transport,	15
	2nd Week	• Models of freight and passenger demand. Model choice; cost functions in the transport sector.	
	3rd Week	• Pricing principle, Special problems of individual models of transport	
	4th Week	• **Module - III: Communications** • Rate- making in telephone utilities, Principles of decreasing costs in telephone industry,	15
July 2024	1st Week	• Characteristics of postal services, Criteria for fixation of postal rates.	
	2nd Week	• Measurement of standards of service in telephone and postal services	
	3rd Week	**Module- IV: Energy Economics**	

		• Primacy of energy in the process of economic development, Factors determining energy demand,	
	4th Week	• Effects of energy shortages, Energy conservation, Renewable and non	
August 2024	1st Week	• Conventional sources of energy; Energy modelling; The search for an optimal energy policy in the Indian context	15
	2nd Week	**Module- V: Social infrastructure** • Organization and financing of supply of social services. Private vs. Public Sector Financing; • Recent debate about the fixation of pricing of social services. Education and Economic Growth.	
	3rd Week	• Approaches to Educational Planning. Social Demand. • Rate of Return and Manpower Balance Approaches. The Case for Universal, Free, Primary Education; Structure of higher education and problems of its financing in India; The issues in education policy	
	4th Week	• Health dimensions of development; Determinants of Health - poverty, malnutrition, • illiteracy and lack of information; Economic dimensions of health care - Demand and supply of health care; Financing of health care and resource constraint	

HOD Signature

H.O.D. & Assistant Professor
Department of Economics
APS College of Arts & Science
N.R. Colony, Bangalore-19

23/9/24

Principal Signature

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APS COLLEGE OF ARTS AND SCIENCE

N.R.COLONY, BANGALORE-560019

Department of Physics

LESSON PLAN 2023-2024

FROM: March 24 TO July 24

NO. HRS: 3 HRS THEORY + 3 HRS PRACTICALS / WEEK

CLASS: II SEM B.SC - NEP Scheme

NAME OF THE FACULTY: Gunashekar J

Theory

Month	week	Topics Covered	Signature
March	Third week	**Electric charge and field:** • Coulomb's law, electric field strength, electric field lines. • Point charge in an electric field and electric dipole. • Work done by a charge (derivation of the expression for potential energy).	
	Fourth week	**Gauss law:** • Gauss's law and its applications - electric fields of a (i) spherical charge distribution, (ii) line charge and (iii) an infinite flat sheet of charge.	
April	First week	**Electrostatic potential** • Electric potential, line integral, gradient of a scalar function, relation between field and potential.	
	Second week	• Potential due to point charge and distribution of charges (potential associated with a spherical charge distribution).	

	Third week	• Potential due to point charge and distribution of charges (infinite line charge distribution, infinite plane sheet of charges).
	Fourth week	• Constant potential surfaces, Potential due to a dipole and electric quadrupole.
May	First week	**Conductors in electrostatic field:** • Conductors and insulators, conductors in electric field.
	Second week	• Capacitance and capacitors, expression for capacitance in a parallel plate capacitor.
	Third week	• Parallel plate capacitor with dielectric, Dielectrics: an atomic view.
	Fourth week	• Energy stored in a capacitor, Dielectric and Gauss's law.
	Fifth week	**DC currents:** • Electric currents and current density.
June	First week	• Electrical conductivity and Ohm's law.
	Second week	• Network theorems (Thevenin's theorem, Superposition theorem).
	Third week	• Network theorems (the maximum power transfer theorem).
	Fourth week	• Transient currents in RC, LR and LCR circuits.
July	First week	**AC circuits:** • RMS and average value of AC, Response of series RL, RC, LCR circuits using j-operator method.
	Second week	• Quality factor, admittance and impedance, power and energy in AC circuits.

PRACTICALS

Month	week	Topics Covered	Signature
April	Second week	• Verification of Superposition theorem.	
	Third week	• Verification of Maximum power transfer theorem.	
	Fourth week	• Charging and discharging of a capacitor (energy dissipated during charging and time constant measurement).	
May	First week	• Verification of Thevenin's theorem.	
	Second week	• Frequency response of LCR Series resonance circuit.	
	Third week	• Frequency response of LCR Parallel resonance circuit.	
June	First week	• Verification of laws of combination of capacitances using de-Sauty's bridge.	
	Second week	• Determination of inductance using Maxwell's impedance bridge.	
	Third week	• Practical repetition.	
	Fourth week	• Mock practical.	

Signature of HOD

Head of the Department of Physics
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

PRINCIPAL

APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

APS COLLEGE OF ARTS AND SCIENCE

N.R.COLONY, BANGALORE-560019

Department of Physics

LESSON PLAN 2023-2024

FROM: March 24 TO July 24

NO. HRS: 3 HRS THEORY + 6 HRS PRACTICALS / WEEK

CLASS: VI SEM B.SC - NEP Scheme

NAME OF THE FACULTY: Gunashekar J

Theory

Month	week	Topics Covered	Signature
March	Third week	**Paper 7: Crystal systems and X-rays:** • Crystal structure: Space Lattice, Lattice translational vectors, Basis of crystal structure. • Types of unit cells, primitive, non-primitive cells. • Seven crystal systems, Coordination numbers, Miller Indices, Expression for inter planner spacing for cubic crystal.	
	Fourth week	**Paper 8: Wave form generators and Filters** • Basic principle of standard AF signal generator: Types wave forms. Fixed frequency and variable frequency. • AF sine wave generator: Phase shift and Wein-bridge oscillators using op-amp principle and working. • Square and triangular wave generator using op-amp.	

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019.

April	First week	**Paper 7:** • **X Rays:** Production and properties of X-rays, Coolidge tube, Continuous and characteristic X-ray spectra; Moseley's law. • **X-Ray diffraction.** Scattering of X-rays, Bragg's law. • **Crystal diffraction:** Bragg's X-ray spectrometer- powder diffraction method, Intensity Vs 2θ plot (qualitative).	
	Second week	**Free electron theory of metals:** • Classical free electron model (Drude-Lorentz model). • Expression for electrical and thermal conductivity, Weidman-Franz law, Failure of classical free electron theory; Quantum free electron theory. • Fermi level and Fermi energy, Fermi-Dirac distribution function (expression for probability distribution F(E)).	
	Third week	**Paper 8:** • Passive and active filters. Fundamental theorem of filters, Proof of the theorem by considering asymmetrical T-network. • Types of filters, Circuitry and Cut-off frequency and frequency response of Passive (RC). • Active (op-amp based) filters: Low pass, high pass and band pass.	
	Fourth week	**Data Conversion and display** • Digital to Analog (D/A) and Analog to Digital (A/D) converters.	
May	First week	**Paper 7:** • Density of states for free electrons. • Qualitative discussion of lattice vibration and concept of Phonons; Specific heats of solids: Classical theory, Einstein's and Debye's theory of specific heats. • Hall Effect in metals.	

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

	Second week	**Magnetic Properties of Matter** • Review of basic formulae: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility, magnetization (M). • Classification of Dia, Para, and ferro magnetic materials. • Langevin Classical Theory of dia – and Paramagnetism.	
	Third week	• Curie's law, Ferromagnetism and Ferromagnetic Domains. • Discussion of B-H Curve. Hysteresis and Energy Loss. Hard and Soft magnetic materials	
	Fourth week	**Paper 8:** • A/D converter with pre-amplification and filtering. • D/A converter - Variable resistor network, Ladder type (R-2R) D/A converter, Op-amp based D/A converter.	
	Fifth week	• Digital display systems and Indicators- Classification of displays, Light Emitting Diodes (LED) and Liquid Crystal Display (LCD) – Structure and working.	
June	First week	**Paper 7:** **Dielectrics:** • Static dielectric constant, polarizability (electronic, ionic and orientation). • Calculation of Lorentz field (derivation).	
	Second week	• Clausius-Mosotti equation (derivation), dielectric loss. • Piezo electric effect, cause, examples and applications.	
	Third week	**Paper 8:** • Data Transmission systems – Advantages and disadvantages of digital transmission over analog transmission.	
	Fourth week	• Pulse amplitude modulation (PAM), Pulse time modulation (PTM).	

July	First week	**Paper 7:** • **Superconductivity:** Definition, Experimental results – Zero resistivity and Critical temperature. • The critical magnetic field – Meissner effect, Type I and type II superconductors.	
	Second week	**Paper 8:** • Pulse width modulation (PWM). • General principles. Principle of Phase Sensitive Detection (PSD).	

PRACTICALS

Month	week	Topics Covered	Signature
April	Second week	**Paper 7:** • Determination of lattice constant using X-ray powder photograph (FCC). • Energy gap of semiconductor.	
	Third week	• Thermistor energy gap. • Fermi Energy of Copper.	
	Fourth week	**Paper 8:** • Design and construct a Wien bridge oscillator (sine wave oscillator) using µA 741 op-amp. • Study the frequency response of a first order op-amp low pass filter.	

PRINCIPAL
APS College of Arts & Scienc
N.R. Colony, Bangalore-560 01

May	First week	• Study the frequency response of a first order op-amp high pass filter. • Design and construct a square wave generator using μA 741 op-amp.	
	Second week	Paper 7: • Study the characteristics of Geiger-Mùller Tube. • Study the absorption of beta particles in aluminium foils using GM counter.	
	Third week	• B-H Curve Using CRO. • Determination of particle size from XRD pattern using Debye-Scherrer formula..	
June	First week	Paper 8: • Study the characteristics of *pn*-junction of a solar cell and determine its efficiency. • Study the characteristics of a LED (variation of intensity of emitted light).	
	Second week	• Design and construct phase shift oscillator using op-amp. • Study the characteristics of a photo-diode.	
	Third week	• Practical repetition.	
	Fourth week	• Mock practical.	

Signature of HOD

Head of the Department of Physics
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

PRINCIPAL

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore-560 019

ACHARYA PATHASALA COLLEGE OF ARTS AND SCIENCE

Narasimharaja Colony, Bangalore –560 019.

Dr B.Jayashree, M.Sc.,(Phy)., M.Phil., Ph.D.,
PRINCIPAL

NO. APS/A&S/ 416 /2023-24 DATE : 21-11-2023

CIRCULAR

The following Committees are constituted for the academic year 2023-24. The respective Committee Conveners are hereby directed to submit their programme of action to the under signed at the earliest.

Dr./Smt/Sri

I	ADMISSION COMMITTEE :	
1	Sathyashree	Convener
2	Hareesha. M.C	Member
3	Sunil Kumar.K	Member
4	Vidya S G	Member
5	Ravi Nayak M	Member
6	Kantharaj. H	Member
7	Asha Y S	Member
8	Harshitha. S	Member
9	Vasanthi K	Member
10	Ragesh. H.K	Member(O)
11	Shivanna. K.A	Member(O)
12	Shruthi. S.M	Member(O)
13	Gnanesh. R	Member (O)

Dr./Smt/Sri

II	LIBRARY COMMITTEE :	
1	Varalakshmi	Convener
2	Ganesh Kumar. R	Member (O)
3	Padmavathi	Member (O)
4	HOD's of All Departments -	Member

III	IQAC COMMITTEE:	
1	Vasanthi.K	Convener
2	Satyashree	Member
3	Hareesha. M.C	Member
4	Sunil kumar. K	Member
5	Dr. Narasimha Parvathikar	Member
6	Vidya S G	Member
7	Ragesh. H.K	Member (O)

IV	TIME –TABLE COMMITTEE :	
1	Milan M.H	Convener
2	Sunil Kumar K	Member
3	Manjunath	Member

V	SUMANA :	
1	Harshitha.S	Convener
2	Chandrakala	Member
3	Vasanthi. K	Member

VI	EXAMINATION COMMITTEE :	
1	Hareesha. M.C	Convener
2	Sunilkumar. K	Member
3	Kantharaju. H	Member
4	Ragesh. H.K	Member (O)
5	Shivanna. K.A	Member (O)

VII	MAGAZINE COMMITTEE :	
1	Kanthraju H	Convener
2	Vidya. S.G	Member
3	Chandramouleshwar	Member
4	Divya. N	Member
5	Milan. M.H	Member

VIII	ATTENDANCE / RESULT COMMITTEE :	
1	Ashwini R	Convener
2	Anupama	Member
3	Sudharshan. K.J	Member
4	Divya. N	Member

IX	PLACEMENT COMMITTEE :	
1	Sunil Kumar. K	Convener
2	Vishakakshi	Member
3	Manjunatha	Member
4	Sumya	Member

X	CULTURAL COMMITTEE :	
1	Sathyashree	Convener
2	Hareesha. M.C	Member
3	Sunilkumar. K	Member
4	Kamalapranesh	Member
5	Shruthi. S.M	Member(O)
6	Padmavathi	Member(O)

XI	DOCUMENTATION COMMITTEE :	
1	Vidya. S.G	Convener
2	Vishalakshi	Member
3	Sudarshan	Member
4	Ragesh. H.K	Member (O)
5	Shivanna. K.A	Member (O)
6	Gnanesh Kumar. R	Member (O)

XII	OBC/SC/ST CELL :	
1	Kantharaju. H	Convener
2	Harshitha. S	Member
3	Shruthi. S. M	Member
4	Rangappa. V	Member

XIII	WOMEN EMPOWERMENT CELL-NIRBHAYA :	
1	Vasanti. K	Convener
2	Sathyashree	Member
3	Harshitha. S	Member
4	Chandrakala	Member

XIV	GRIEVANCE RE-DRESSAL & ANTI RAGGING CELL :	
1	Kantharaku. H	Convener
2	Vidya. S.G	Member
3	Chandramouleshwara	Member

XV	MENTOR COMMITTEE:	
1	Harshitha. S	Convener
2	Dr. Narasimha Parvathikar	Member
3	Anupama	Member
4	Ashwini. R	Member
5	Kantharaj. H	Member

XVI	COMMITTEE RELETED TO EDUCATION	
1	DEPARTMENT/SCHOLERSHIP & UNIVERSITY) :	
2	Kantharaju. H	Convener
3	Hareesha. M.C	Member
4	Shivanna. K.A	Member (O)
5	Rangappa. V	Member (O)

XVII	NSS COMMITTEE:	
1	Hareesha. M.C	Convener
2	Ashwini. R	Member
3	Sunilkumar. K	Member
4	Anupama	Member
5	Kantharaju. H	Member

XVIII	RESEARCH COMMITTEE :	
1	Dr.Narasimha Parvathikar	Convener
2	Hareesha. M.C	Member
3	Vasanthi. K	Member
4	Sunilkumar. K	Member
5	Chandrakala. V	Member

XIX	ANTI-SEXUAL COMMITTEE & SQUAD:	
1	Vasanti. K	Convener
2	Sathyashree	Member
3	Chandrakala	Member
4	Gayathri. S.C	Member
5	Ashwini. R	Member

XX	DISCIPLINERY COMMITTEE :	
1	Sathyashree	Convener
2	Vasanti. K	Member
3	Hareesha. M.C	Member
4	Sunilkumar. K	Member
5	Ragesh. H.K	Member(O)

XXI	HUMAN RIGHTS PROTECTION CELL :	
1	Dr.Narasimha Parvathikar	Convener
2	Sunil Kumar. K	Member
3	Sumya	Member
4	Milan. M.H	Member
5	Sudharshan	Member

XXII	NEP COMMITTEE :	
1	Dr.Narasimha Parvathikar	Convener
2	Sathyashree	Member
3	Sunilkumar. K	Member
4	Hareesha. M C	Member
5	Ragesh. H.K	Member (O)

XXIII	HEALTH CLUB :	
1	Dr.Narasimha Parvathikar	Convener
2	Vidya S G	Member
3	Sumya	Member
4	Ashwini. R	Member
5	Ragesh. H.K	Member (O)

XXIV	UGC & TDS COMMITTEE:	
1	Satyashree	Convener
2	Ragesh. H.K	Member(O)
3	Shruthi. S.M	Member(O)
4	Padmavathi	Member(O)

XXV	SPORTS COMMITTEE :	
1	Keerthiraj C S	Convener
2	Sunil Kumar K	Member
3	Divya. N	Member
4	Milan	Member
5	Kantharaj. H	Member
6	Chandramouleshwara	Member (O)
7	Ragesh. H.K	Member (O)
8	Susheelamma	Member (O)

XXVI	ECO- CLUB :	
1	Sudarshan. K.J	Convener
2	Ravi Naik M	Member
3	Asha Y S	Member

XXVII	ELECTRAL LITERACY CLUB:	
1	Ravi Naik M	Convener
2	Sumya	Member
3	Kantharaj. H	Member
4	Sudharshan	Member
5	Vidya. S.G	Member

XXVIII	YRC COMMITTEE :	
1	Sunil Kumar. K	Convener
2	Hareesha. M C	Member
3	Harshitha. S	Member
4	Sumya	Member
5	Kantharaj. H	Member
6	Keerthiraj C S	Member

21/11/23

PRINCIPAL

PRINCIPAL
APS College of Arts & Science
N.R. Colony, Bangalore