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**THE NATIONAL COLLEGE BASAVANAGUDI, BENGALURU- 560 004**

**[AUTONOMOUS]**

Website: www.ncbgudi.com

NAAC Accredited 'B++' Grade

# List of Open Elective Papers

Sl No.	Department	Title
1.	Botany	Plants and Human Welfare
2.	Chemistry	Molecules of Life
3.	Commerce	Accounting For Everyone
4.	Computer Science	Computer Application & Information Technology
5.	Electronics	Digital Fundamentals and Consumer Electronics
6.	Economics	Indian Economy Prior to Economic Reforms
7.	English	Functional English Grammar and Study Skills
8.	Physics	Energy Sources
9.	Sociology	Sociology of Everyday Life
10.	Zoology	Economics of Zoology



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**Open Elective – Botany Paper**

**Paper Title -- Plants and Human Welfare**

<b>Number of Theory Credits</b>	<b>3</b>	<b>Number of Lecture Hours/semester</b>	<b>42</b>
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**Course Outcome:**

1. To make the students familiar with diverse plants that are resources to human life.
2. To create awareness among students to know economic, medicinal, industrial and aesthetic values of plants.
3. To motivate interest among students on plants importance in day today life.

<b>Module - 1</b>		<b>14 Hours</b>
<b>Chapter – 1:</b> Introduction to fungi, Economic importance of fungi in Medicine, Agriculture & Industry. Mushroom Culture & Common edible mushrooms.		<b>04 Hours</b>
<b>Chapter – 2:Cereals:</b> Rice & Wheat (Morphology, Post-harvest processing & Uses) Brief account of millets and their nutritional importance.		<b>04 Hours</b>
<b>Chapter – 3:</b> Legumes Chief pulses grown in Karnataka – Red gram, green gram. Chick pea, Soybean. Importance to man & ecosystem.		<b>03 Hours</b>
<b>Chapter 4:Micro green</b> – What & How to grow micro green & its importance.		<b>03 Hours</b>
<b>Module - 2</b>		<b>14 Hours</b>
<b>Chapter- 5:Cash Crops:</b> Sugarcane & Natural Rubber –Morphology Cultivation & economic importance.		<b>04 Hours</b>
<b>Chapter -6:Spices:</b> Morphology & Economic importance of Clove, Cinnamon, and Cardamom & Black pepper.		<b>03 Hours</b>
<b>Chapter – 7:Beverages:</b> Tea, Coffee & Cocoa – Morphology & economic importance.		<b>03 Hours</b>
<b>Chapter – 8:Oils &amp; Fats:</b> Edible Oil – Ground nut, Coconut & Mustered oil – Morphology & Economic importance. Non-Edible Oil yielding plants & its importance as biofuel. Example Neem.		<b>04 Hours</b>
<b>Module - 3</b>		<b>14 Hours</b>
<b>Chapter – 9:Essential Oils</b> – Sandal wood oil, Rose oil & Eucalyptus oil. Economic importance as medicine perfumes & insect repellents.		<b>04 Hours</b>
<b>Chapter 10:Drug-yielding Plants</b> – Cinchona, Digitalis, Aloe vera& Cannabis – Therapeutic and habit- forming drugs.		<b>03 Hours</b>
<b>Chapter – 11:Fibres:</b> Cotton, Jute & Coir -Morphology & economic Importance.		<b>03 Hours</b>
<b>Chapter – 12:Forests:</b> Forest & forest products. Community forestry. Concepts of reserve forests, sanctuaries and national parks with reference to India. Endangered species and red data book.		<b>04 Hours</b>

**Text Books & References**

1. Kochhar, S.L. (2012). Economic Botany in Tropics. New Delhi, India: MacMillan & Co.

2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. The Netherlands: Kluwer Academic Publishers.
3. Chrispeels, M.J. and Sadava, D.E. (1994) Plants, Genes and Agriculture. Jones & Bartlett- Publishers.



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**Open Elective - Chemistry**

**Paper Title -Molecules of Life**

<b>Number of Theory Credits</b>	<b>3</b>	<b>Number of Lecture Hours/semester</b>	<b>42</b>
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Unit – 1

14 h

Carbohydrates

Classification of carbohydrates, reducing and non-reducing sugars, General properties of glucose and fructose, their open chain structures. Epimers, mutarotation and anomers.

Linkage between monosaccharides, structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation.

Carbohydrates as a source of energy

Amino Acids, Peptides and Proteins

Classification of amino acids, Zwitterions structure and Isoelectric point. Peptides:

structure and conformation, example and function of biologically important Peptides.

Proteins: Classification based on composition, shape and function with examples.

Overview of Primary, Secondary, Tertiary and Quaternary structure of proteins.

Importance of primary structure by taking sickle cell anemia as example.

Determination of primary structure of peptides.

Denaturation of proteins: Renaturation of proteins.

Unit - 2		14 h
Enzymes and correlation with drug action		
Brief enz:	Replication, Transcription and Translation.	
Effe moc enz:	Physico- chemical properties of nucleic acids - effect of alkali, acid and heat (denaturation and renaturation),	
thei spe (Co	Mutation Mutagens- chemical and physical, Molecular basis of mutation: spontaneous and induced mutations. Types of mutation,	
Drug bind	Concept of Energy in Bio systems	
Lipid	Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells.	
Intr pho acid Ran	Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change.	
Sap glyc defi	Conversion of food into energy. Outline of catabolic pathways of Carbohydrate- Glycolysis, Fermentation, and Krebs Cycle. Overview of catabolic pathways of Fats and Proteins. Interrelationships in the metabolic pathways of Proteins, Fats and Carbohydrates.	
defi significance.	Introduction to bioenergetics, stages of energy transformation- Photosynthesis respiration and utilization of energy. Exergonic and endergonic reactions. Standard free energy change.	

Unit - 3		14 h
Nucleic Acids		
Components of nucleic acids: Adenine, guanine, thymine and cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature),		
Structure of polynucleotides; Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, -(general features and about Central dogma of Molecular biology)		
Biological roles of DNA and RNA:		





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## Commerce

### Pedagogy:

Classroom lecture, tutorials, Group discussion, Seminar, Case studies & field work

### Course Outcomes:

**On successful completion of the course, the students will be able to** acquire basic knowledge on financial accounting and to impart preliminary skills for recording various kinds of financial transactions.

### Syllabus

#### **Module: 1 – Introduction to Accounting**

**12 Hrs**

Accounting – Meaning, Importance and Need, Its objectives and relevance to business establishments and other organizations and individuals; Accounting Concepts & Conventions  
Some Basic Terms – Transaction, Account, Asset, Liability, Capital, Expenditure & Expense, Income, Revenue, Gain, Profit, Surplus, Loss, Deficit. Debit, Credit, Accounting Year, Financial Year.

#### **Module: 2 – Recording of Transactions**

**12 Hrs**

Transactions and recording of transactions Features of recordable transactions and events, Recording of transactions: Personal account, Real Account and Nominal Account; Rules for Debit and Credit;  
Double Entry System, journalizing transactions; Preparation of Ledger – Simple problems

#### **Module: 3 – Final Accounts of Sole Proprietorship Concerns**

**12 Hrs**

Fundamental Accounting Equation; Preparation of Trial Balance; Concept of revenue and Capital; Preparation of Trading and Profit & Loss Account, Balance Sheet

#### **Module: 4 – Computerized Accounting**

**4 Hrs**

Introduction to Computerized Accounting Systems: Introduction to popular accounting softwares

#### **Skill Developments Activities:**

- Prepare a set of Final Accounts with imaginary figures
- List out the popular Accounting Software in practice
- Visit an outlet near your place and understand the process of accounting followed

#### **Reference Books:**

1. Hatfield, L - Accounting Basics - Amazon Digital Services LLC.
2. Dr. Muralidhar S & others – Basics of Financial Accounting – Kalyani Publishers
3. Horngren, C. T., Sundem, G. L., Elliott, J. A., & Philbrick, D - Introduction to Financial Accounting - Pearson Education
4. Siddiqui, S. A - Book Keeping & Accountancy -Laxmi Publications Pvt. Ltd.
5. Sehgal, D - Financial Accounting -Vikas Publishing House Pvt. Ltd
6. Tulsian, P. C - Financial Accounting - Tata McGraw Hill Publishing Co. Ltd.
7. Mukharji, A., & Hanif, M - Financial Accounting - Tata McGraw Hill Publishing Co. Ltd.
8. Maheshwari, S. N., Maheshwari, S. K., & Maheshwari, S. K - Financial Accounting - Vikas Publishing House Pvt. Ltd
9. Mukherjee, S., & Mukherjee, A. K - Financial Accounting - Oxford University Press
10. Jain, S. P., & Narang, K. L – Financial Accounting – Kalyani Publishers



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## Computer Science – Open Elective

### Title: Computer Applications and Information Technology

Lecture Hrs : 40

Credits 3

Internal Marks : 40

Exam Marks : 60

#### Course Objectives:

This course will introduce students to the fundamental concepts underlying modern computer organization and architecture. Main objective of the course is to familiarize students about hardware design including logic design, basic structure and behaviour of the various functional modules of the computer and how they interact to provide the processing needs of the user. The emphasis is on studying Internet, network and ecommerce architecture design and their impact on performance.

#### Course Outcomes:

The students will be able to understand the basics of computer hardware and how software interacts with computer hardware; To understand Basics of Internet, network and ecommerce structures & its functions.

#### Unit-I: Introduction to Computers

8 Hours

Definition, Characteristics and limitations of computers- Hardware and software  
Data and Information: Types of data, Simple Model of computer  
Computer applications- data processing, information processing, commercial, office Automation, industry and engineering, healthcare, education, graphics and multimedia.

#### Unit - II :Network of computers

8 Hours

Types of networks. LAN, intranet and Internet, Internet applications, E-mail browsing and searching, Search engines, Multimedia applications.

#### Unit - III :Internet and Internet application

8 Hours

Introduction, Internet evolution, Working of Internet, Use of Internet, Overview of World Wide Web (Web Server and Client), Introduction to Search engine and Searching the Web, Downloading files, Introduction to Web Browsers, Working with E-mail (creation and use of the same).

#### Unit-IV :Business Information systems

8 Hours

Introduction, Types of Information needed by Organizations, Uses of computers, Management Structure and their Information needs, Design of an operational information system, System life Cycle, Computer System for Transaction Processing.

#### Unit-V :Electronic Commerce

8 Hours

Introduction, Business to Customer E-Commerce, Business to Business E-Commerce, Customer to Customer E-Commerce, Advantages and disadvantages of E-Commerce, E-Commerce System Architecture, Digital Signature, Payment schemes in E-Commerce, Electronic clearing service, Cash Transactions, Payment in C2C, Electronic data interchange.

**TEXT BOOKS**

1. Fundamentals of Computers, Rajaraman .V
2. Introduction to Information Technology, second edition, V.Rajaraman

**REFERENCES BOOKS**

1. Computers for everyone, Vikas UBS
2. Computer Fundamentals, BPB Pub.





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### Open Elective – English Paper

#### Paper Title –FUNCTIONAL ENGLISH GRAMMAR AND STUDY SKILLS

Number of Theory Credits	3	Number of Lecture Hours/semester	40
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#### Section I: Functional English Grammar

1. Grammar of Spoken and Written English
2. Basic Sentence Patterns in English – Analysis of Sentence Patterns (SVO, SV,SVOC, SVOA, SVOA/C)
3. Functions of Various Types of Phrases: Noun Phrases, Verb Phrases, Adjective Phrases, Adverbial Phrases, Prepositional Phrases
4. Functions of Clauses: Noun Clause, Adjective Clause and Adverbial Clause and Prepositional Clauses
5. Verbs – Tense and Aspects, Modal Verbs, Functions and Use

#### Section II: Writing Skills

1. Writing as a Skill – Its Importance, Mechanism of Writing, Words and Sentences, Paragraph as a Unit of Structuring the Whole Text, Analysis of Paragraph
2. Functional Uses of Writing: Personal, Academic and Business
3. Writing Process: Planning a Text, Finding Materials, Drafting, Revising, Editing, Finalising Draft
4. Models of Writing: Expansion of Ideas, Dialogue Writing, Drafting an Email

#### Section III: Reading Skills

1. Meaning and Process of Reading
2. Strategies and methods to Improve Reading Skill
3. Sub-skills of Reading: Skimming, Scanning, Extensive Reading, Intensive Reading

#### Suggested Reading:

1. Geoffrey Leech and Svartik. Communicative Grammar of English, Pearson
2. Geoffrey Leech. English Grammar for Today, Palgrave
3. Prasad P. The Functional Aspects of Communicative Skills.
4. Leena Sen. Communication Skills, Princeton Hall
5. Vandana Singh. The Written Word, OUP



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**THE NATIONAL COLLEGE BASAVANAGUDI BANGALORE**  
**OPEN ELECTIVE PAPER IN ELECTRONICS FOR I SEMESTER**  
**Digital Fundamentals and Consumer Electronics**

**Max Hrs: 45 Hrs**

**Unit 1**

**20 Hrs**

**Number System:** Decimal, Binary, Octal and Hexadecimal – their inter conversion. BCD numbers (8421), Gray, Excess 3, ASCII and EBCDIC codes. Error detecting and correcting codes. Arithmetic operations in Binary, Hexadecimal. BCD addition and Excess 3 addition. Sign magnitude convention, 1's and 2's Complements-2's Complement Subtraction, signed number arithmetic-addition.

Positive and Negative Logic, Basic Logic gates-AND, OR and NOT gates (Logic symbols and Truth tables),

**Boolean algebra-** Laws and Theorems, NAND and NOR gates (Logic symbols and Truth tables), De Morgan's theorems, NAND and NOR as Universal gates.

Simplification of Logic Expressions using Boolean algebra, SOP and POS expressions. Karnaugh maps-K-Map techniques to solve 3 variable and 4 variable expressions.

**UNIT 2**

**13 Hrs**

**Audio Systems:** PA system, Microphones, Amplifier, Loudspeakers, Radio Receivers, AM/FM, Audio Recording, and reproduction, Installation of Audio/Video systems – site preparation, electrical requirements, cables and connectors. Study of PA systems for various situations – Public gathering, Closed theatre / Auditorium, Conference room, Prepare bill of material (Costing)

**UNIT 3**

**12 Hrs**

**TV and Displays:** set top box, CATV and Dish TV, LCD, Plasma, LED, OLED, QDLED and LED TV, Projectors: DLP, Home Theatres, Remote controls.

**Text Books:**

- 1) Thomas L.Floyd, "Digital Fundamentals", Pearson Education Inc, New Delhi, 2003

**Reference Books:**

1. Morris Mano, "Digital Design", 5 Th Edition, Prentice Hall, 2013
2. R.P.Jain, "Modern Digital Electronics", 3rd Edition, Tata Mc Graw Hill, 2003.
3. Bignell and Donovan, "Digital Electronics", 5th Edition, Thomson Publication, 2007.
4. Consumer Electronics, R.P.Bali, Pearson Education, 2008
5. R Audio and Video systems, G. Gupta, Tata McGraw Hill, 2004
6. 3D Flat Panel – Practical tool for self-assessment., TVs and Displays, Gerardus Blokdyk., edition, 2018
7. Basic TV Technology – Digital and Analog, Robert L Harwing., 4 th Edition, Routhledge, 2012.
8. The TVs of Tomorrow: How RCA's Flat-Screen Dreams Led to the First LCDs (Synthesis), Benjamin Gross., Illustrated edition, University of Chicago Press; 2018
9. OLED Display – Fundamentals and Applications., Takatoshi Tsujimura., Willey, 2012



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### SEMESTER 1

<b>Course Title: OEC 1.3.2: Indian Economy Prior to Economic Reforms(OEC)</b>	
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 Outcomes (COs):

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

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

<b>I Features and problems of Indian Economy</b>	<b>15</b>
<b>Chapter 1: Features of Indian Economy</b>	<b>4</b>
<ul style="list-style-type: none"><li>India as a developing economy,</li><li>Demographic features</li><li>Human Development (HDI),</li><li>Problems of Poverty, Unemployment, Inflation, income inequality</li></ul>	
<b>Chapter 2: Issues in Agriculture sector in India</b>	<b>6</b>
<ul style="list-style-type: none"><li>Land reforms</li><li>Green Revolution</li><li>Agriculture marketing in India</li><li>Agricultural price policy</li></ul>	
<b>Chapter 3: Industrial and Service Sector</b>	<b>5</b>
<ul style="list-style-type: none"><li>Industrial development;</li><li>Micro, Small and Medium Enterprises,</li><li>Industrial Policy</li><li>Performance of public sector in India,</li><li>Service sector in India.</li></ul>	
<b>Practicum:</b>	
<ol style="list-style-type: none"><li>Identifying economic problems and their causes;</li><li>Mini-project on any aspect of Indian agriculture, industry, service and public sectors</li></ol>	

<b>II Economic Policies</b>	<b>13</b>
<b>Chapter 4: Planning</b>	<b>5</b>
<ul style="list-style-type: none"> <li>• Mixed Economy</li> <li>• Bombay Plan</li> <li>• Gandhian Model</li> <li>• Nehru Mahalanobis Model</li> <li>• Objectives and achievements of economic planning in India</li> </ul>	
<b>Chapter 5: Monetary policy in India</b>	<b>2</b>
<ul style="list-style-type: none"> <li>• Instruments of Monetary Policy</li> <li>• Black money in India – Magnitude and Impact</li> </ul>	
<b>Chapter 6: Fiscal Policy in India</b>	<b>6</b>
<ul style="list-style-type: none"> <li>• Tax Revenue</li> <li>• Public expenditure</li> <li>• Budgetary deficits</li> <li>• Fiscal reforms</li> <li>• Public debt management and reforms</li> <li>• Centre state Finance Relations and Finance commissions in India.</li> </ul>	
<b>Practicum:</b> Assignment on successes and failures of India's planning; Monetary and Fiscal Policy instruments	

<b>III External sector and Nature of Reforms in India</b>	<b>14</b>
<b>Chapter 7: India's foreign trade</b>	<b>6</b>
<ul style="list-style-type: none"> <li>• Salient features</li> <li>• Value, composition and direction of trade</li> <li>• Balance of payments</li> <li>• Goal of self-reliance based on import substitution and protection • Tariff policy</li> <li>• Exchange rate</li> </ul>	
<b>Chapter 8: Post-1991 strategies</b>	<b>6</b>
<ul style="list-style-type: none"> <li>• Stabilisation and structural adjustment packages</li> <li>• Liberalisation,Privatisation,Globalisation (LPG) Model</li> <li>• Impact of LPG Policies on Indian Economy</li> </ul>	
<b>Chapter 9: NITI Ayog</b>	<b>2</b>
<ul style="list-style-type: none"> <li>• Organization</li> <li>• Functions</li> </ul>	
<b>Practicum:</b> Calculation of BoP and evaluating trade policies; Assignment and group discussion on the impact of LPG Policies	

**Suggested Readings:**

1. DuttRuddar 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.





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**Open Elective – Physics Paper**

**Paper Title –Energy Sources**

<b>Number of Theory Credits</b>	<b>3</b>	<b>Number of Lecture Hours/semester</b>	<b>40</b>
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<b>Unit-I: Non-Renewable energy sources</b>	<b>Hrs.</b>
<p><b>Introduction:</b> Energy concept-sources in general, its significance &amp; 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)</p> <p><b>Conventional energy sources:</b> Fossil fuels &amp; Nuclear energy- production &amp; extraction, usage rate and limitations. Impact on environment and their issues &amp; challenges. Overview of Indian &amp; world energy scenario with latest statistics- consumption &amp; necessity. Need of eco-friendly &amp; green energy &amp; their related technology. (8 hours)</p>	<b>13</b>
<b>Unit-II: Renewable energy sources</b>	
<p><b>Introduction:</b> 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)</p> <p><b>Solar energy:</b> Solar Energy-Key features, its importance, Merits &amp; 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)</p>	<b>13</b>
<b>Unit-III</b>	
<p><b>Wind and Tidal Energy harvesting:</b> 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)</p> <p><b>Geothermal and hydro energy:</b> 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)</p>	<b>13</b>

### 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 - Suhas 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](http://en.wikipedia.org/wiki/Renewable_energy)





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<b>Open Elective – Sociology Paper</b>			
<b>Paper Title –Sociology of Everyday Life</b>			
<b>Number of Theory Credits</b>	<b>3</b>	<b>Number of Lecture Hours/semester</b>	<b>40</b>
<b>Module – 1 Introduction</b>			<b>14 Hours</b>
<b>Chapter No. 1:</b> Sociology as a study of Social Interaction and its Need			
<b>Chapter No. 2:</b> Everyday Life - Meaning; Why Study Everyday Life? (Contributions of Erving Goffman and Anthony Giddens); Role of Socialisation in establishing habits and practices- action, thinking and feeling			
<b>Chapter No. 3:</b> Social Institutions as Established Practices and Customs - Definition and Elements			
<b>Chapter No. 4:</b> Challenges and Problems of Everyday Life			
<b>Module – 2 Self and Society</b>			<b>13 Hours</b>
<b>Chapter No. 5:</b> Definition of Situation (W I Thomas 'Principle)			
<b>Chapter No. 6:</b> The Looking-Glass Self; Relation between Individual and Society			
<b>Chapter No. 7:</b> Role of Social Media in Constructing Self and Identity			
<b>Module – 3 Culture in Everyday Life</b>			<b>13 Hours</b>
<b>Chapter No. 8:</b> Definition of Culture; Types of Culture: High Culture, Popular Culture, Recorded Culture and Lived Culture			
<b>Chapter No. 9:</b> Mass Media and Everyday Life			
<b>Chapter No. 10:</b> Globalisation and Cultural Diffusion			



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NAAC Accredited 'B++' Grade

Open Elective – Zoology Paper			
Paper Title – Economics of Zoology			
Number of Theory Credits	3	Number of Lecture Hours/semester	42

#### Outcomes

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

1. Gain knowledge about silkworms rearing and their products.
2. Gain knowledge in Bee keeping equipment and apiary management.
3. Acquaint knowledge on dairy animal management, the breeds and diseases of cattle and learn the testing of egg and milk quality.
4. Acquaint knowledge about the culture techniques of fish and poultry.
5. Acquaint the knowledge about basic procedure and methodology of Vermiculture.
6. Learn various concepts of lac cultivation.
7. Students can start their own business i.e. self-employments.
8. Get employment in different applied sectors

Content	Hrs.
Unit I	14
<b>Chapter 1. Sericulture:</b> <ul style="list-style-type: none"><li>• History and present status of sericulture in India</li><li>• Mulberry and non-mulberry species in Karnataka and India</li><li>• Mulberry cultivation</li><li>• Morphology and life cycle of <i>Bombyx mori</i></li><li>• Silkworm rearing techniques: Processing of cocoon, reeling</li><li>• Silkworm diseases-pests and their control</li></ul> <b>Chapter 2. Apiculture:</b> <ul style="list-style-type: none"><li>• Introduction and present status of apiculture</li><li>• Species of honey bees in India, life cycle of <i>Apis indica</i></li><li>• Colony organization, division of labour and communication</li><li>• Bee keeping as an agro based industry; methods and equipments: indigenous methods, extraction appliances, extraction of honey from the comb and processing</li><li>• Bee pasturage, honey and bees wax and their uses</li><li>• Pests and diseases of bees and their management</li></ul>	

Unit II	14
<p><b>Chapter 3. Live Stock Management:</b></p> <ul style="list-style-type: none"> <li>• <b>Dairy:</b> Introduction to common dairy animals and techniques of dairy management</li> <li>• Types, loose housing system and conventional barn system; advantages and limitations of dairy farming</li> <li>• Establishment of dairy farm and choosing suitable dairy animals-cattle</li> <li>• Cattle feeds, milk and milk products</li> <li>• Cattle diseases</li> <li>• <b>Poultry:</b> Types of breeds and their rearing methods</li> <li>• Feed formulations for chicks</li> <li>• Nutritive value of egg and meat</li> <li>• Disease of poultry and control measures</li> </ul> <p><b>Chapter 4. Aquaculture:</b></p> <ul style="list-style-type: none"> <li>• Aquaculture in India: An overview and present status and scope of aquaculture</li> <li>• Types of aquaculture: Pond culture: Construction, maintenance and management; carp culture, shrimp culture, shellfish culture, composite fish culture and pearl culture</li> </ul>	

Unit - III	14
<p><b>Chapter 5. Fish culture:</b></p> <ul style="list-style-type: none"> <li>• Common fishes used for culture.</li> <li>• Fishing crafts and gears.</li> <li>• Ornamental fish culture: Fresh water ornamental fishes- biology, breeding techniques</li> <li>• Construction and maintenance of aquarium: Construction of home aquarium, materials used, setting up of freshwater aquaria, aquarium plants, ornamental objects, cleaning the aquarium, maintenance of water quality, control of snail and algal growth.</li> <li>• Modern techniques of fish seed production</li> </ul> <p><b>Chapter 6. Prawn culture:</b></p> <ul style="list-style-type: none"> <li>• Culture of fresh and marine water prawns.</li> <li>• Preparation of farm.</li> <li>• Preservation and processing of prawn, export of prawn.</li> </ul> <p><b>Chapter 7. Vermiculture:</b></p> <ul style="list-style-type: none"> <li>• Scope of Vermiculture.</li> <li>• Types of earthworms.</li> <li>• Habit categories - epigeic, endogeic and anecic; indigenous and exotic species.</li> <li>• Methodology of vermicomposting: containers for culturing, raw materials required, preparation of bed, environmental pre-requisites, feeding, harvesting and storage of Vermicompost.</li> <li>• Advantages of vermicomposting. Diseases and pests of earthworms.</li> </ul>	
<p><b>Chapter 8. Lac Culture:</b></p> <ul style="list-style-type: none"> <li>• History of lac and its organization, lac production in India. Life cycle, host plants and strains of lac insect.</li> <li>• Lac cultivation: Local practice, improved practice, propagation of lac insect, inoculation period, harvesting of lac.</li> <li>• Lac composition, processing, products, uses and their pests</li> </ul>	

**Text Books & Suggested Readings:**

1. Eikichi, H. (1999). Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G. (2003). Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling.
3. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad, R., (2000). Mulberry Silk
5. Reeling Technology Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
6. Roger, M (1990). The ABC and Xyz of Bee Culture: An Encyclopedia of Beekeeping, Kindle Edition.
7. Shukla and Upadhyaya (2002). Economic Zoology, Rastogi Publishers
8. YadavManju (2003). Economic Zoology, Discovery Publishing House.
9. JabdePradip V (2005). Textbook of applied Zoology. Discovery Publishing House, New Delhi.
10. Cherian & Ramachandran Bee keeping in-South Indian Govt. Press, Madras.
11. Sathe, T.V. Vermiculture and Organic farming.
12. Bard, J (1986). Handbook of Tropical Aquaculture.
13. Santhanam, R. A. Manual of Aquaculture.
14. Zuka, R.I and Hamiyn (1971). Aquarium fishes and plants
15. Jabde, P.V. (2005) Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac culture.
16. Animal Disease- Bairagi K. N. Anmol Publications Pvt.Ltd 2014
17. Economics Of Aquaculture - Singh (R.K.P) - Danika Publishing Company 2003
18. Applied and Economic Zoology (SWAYAM) web [https://swayam.gov.in/nd2\\_ccc20\\_ge23/preview](https://swayam.gov.in/nd2_ccc20_ge23/preview)