

**ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE - 27
GUIDELINES, LIST AND SYLLABUS OF OPEN ELECTIVES FOR
POST GRADUATE STUDENTS (3RD SEMESTER) OFFERED UNDER
CHOICE BASED CREDIT SYSTEM (CBCS)
2022-2023**



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General guidelines for open electives (PG courses) under CBCS

- Postgraduate students who have enrolled for the programme from the academic year 2015-2016 and subsequent batches come under CBCS
- Students will have to select open electives in the third semester along with their Major (Core) papers
- They will have to choose 1 open electives of 30 hours from a pool of elective papers offered by other post graduate departments
- Means of evaluation and attendance requirements for open electives is same as the other major papers
- The mode of assessment is:
Activity 1 – **7.5 marks**, Activity 2 – **7.5 marks** and end semester examination **35 marks**. The total marks for Open elective are **50**. Total marks to pass in open elective remains 40%.
- Registration of open electives to be done online. **Online registration will begin on 23rd August 2022**. It will start between 3 - 4 p.m. Kindly complete the selection process by 26th of August 2022.
- Selection of electives is on first come first serve basis
- For registration log in to <https://sjc.linways.com/student/> using your User name and Password
- Click on Menu and then Open elective
- List of open electives with their availability will be shown
- Select the Open electives of your choice from the pool provided
- If you are not sure of your options, reselect the electives of your choice and click apply
- Once you have submitted your options, the selected electives will be displayed on your screen
- Options once submitted cannot be changed under any circumstances
- You can then view your chosen open elective under Selected Open Elective

Note: PG OPEN ELECTIVE CLASSES WILL BEGIN FROM 29TH AUGUST 2022

**LIST OF OPEN ELECTIVES OFFERED BY DEPARTMENTS FOR
POST GRADUATE STUDENTS**

OE No.	DEPARTMENT	CODE	TITLE OF THE <u>OPEN ELECTIVE</u> (OE)
1	BOTANY	BOOE 9521	HORTICULTURE
2	CHEMISTRY AND ORGANIC CHEMISTRY	CHOE 9521	LIFE'S LABORATORIES
3	COMPUTER SCIENCE	CSOE 9521	WEB TECHNOLOGIES
4	ECONOMICS	ECOE 9621	BASIC ECONOMICS FOR NON-ECONOMISTS
5	ENGLISH	ENOE 9718	MAKING IT UP: WRITING FICTION AND NON-FICTION FOR CHILDREN
6	MASS COMMUNICATION	MCOE 9521	INDIAN CINEMA
7	MATHEMATICS	MTOE 9722	MAKING THE RIGHT DECISIONS
8	MICROBIOLOGY	MBOE 9521	MICROBES AND US
9	PHYSICS	PHOE 9420	ASTROPHYSICS
10	POLITICAL SCIENCE	PSOE 0519	READINGS IN INDIAN POLITY: PUBLIC INSTITUTIONS AND CHALLENGES
11	SOCIAL WORK	SWOE 9921	HUMAN RIGHTS
12	COMMERCE	COOE 9721	PERSONAL FINANCIAL PLANNING
13	FOOD SCIENCE AND TECHNOLOGY	FSTOE3522	NUTRITION, DIET AND HEALTH
14	STATISTICS	STOE 9620	STATISTICAL METHODS
15	BIOTECHNOLOGY	BTOE 9522	TRANSGENICS AND BIOETHICS
16	PSYCHOLOGY	PY0E9521	FOUNDATION AND APPLICATION OF PSYCHOLOGY

OE - 1

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
BOTANY	BO OE 9521	Horticulture	30	02

Course Objectives:

- To understand the principles, objectives, scope and Application of Horticulture.
- To impart knowledge on Propagation structures, Plant propagation methods, Management of plant nurseries, Entrepreneurship and Establishment of Small scale industry in Floriculture, Pomiculture and Olericulture, research and application of Horticulture.
- To be unable them to write and communicate a research paper.

Module No.	Content	No. of Hours
Unit 1	Introduction to Horticulture : Branches, applications and significance.	1
Unit 2	Propagation structures: Types of propagation structures – green house, polyhouse and their uses in plant propagation.	3
Unit 3	Plant propagation: Media for plant propagation. Techniques of plant propagation: cutting, layering, grafting and budding	6
Unit 4	Management of plant nurseries: General layout and components of a nursery, types of nurseries. Practices followed in a nursery – potting, seeding, manuring. Irrigation and types of irrigation – drip irrigation and micro sprinklers.	6
Unit 5	Entrepreneurship: A general account of cultivation, post-harvest care, processing, packaging and marketing Practices in Floriculture, Pomiculture and Olericulture,	8
Unit 6	A brief account of organic farming, terrace gardening, vertical gardening, landscaping, Ikebana and bonsai techniques.	6

Sl. No.	References
1	Poehlman, J.M., and Brothukar, I.B.H., 1998. Breeding of Asian plants. I.B.H. New Delhi.
2	Singh, B.D.A 2000. Plant Breeding. Kalyani Publ. New Delhi.
3	Sharma, J.R. 1994. Plant breeding. T.M.H. Publ. Comp. New Delhi.
4	Kumaresan V, 2001. Horticulture and Plant Breeding, Saras publication.
5	Sharma R R, Manish Srivastava 2000, Plant propagation and nursery management
6	Hartman, H.J. et al. 1990. Plant propagation - Principles and practices. Prentice Hall, New Delhi.
7	Sharma, V.K. 1996. Plant nurseries, Techniques, production and management. Indian Pub. New Delhi

OE - 2

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
CHEMISTRY	CHOE9521	LIFE'S LABORATORIES	30	02

Module No.	Content	No. of Hours
1	CHEMISTRY AND SOCIETY An introduction of the impact of chemistry on society.	2
2	MOLECULAR GASTRONOMY Introduction to molecular gastronomy: history & development. Chemical structures and properties of food; colloid chemistry; emulsions culinary/cooking processes: freezing, heating (conduction, convection, radiation); applications. A preliminary knowledge of flavors, colors, emulsifiers stabilizers, additives. Novel ingredients and delivery mechanisms. Laboratory based technologies (including water baths, freeze drying).	5
3	FORENSIC CHEMISTRY What is forensic science? An idea of the analytical techniques used: a) Atomic Spectroscopy b) Microspectrophotometry c) Electrophoresis d) Microscopy e) Chromatography f) Immunoassays. Analysis of Forensic Samples – a) Drug Analysis b) Combustion & Arson c) Inks, Paints, & Pigments d) Polymers & Fibers	5
4	MOLECULAR PROCESSES Biological clock, circadian clock; Molecules involved and their interactions. Consequences of sleep deprivation – physiological and neurological – molecules and their interplay.	3
5	GREEN CHEMISTRY AND THE INDUSTRY What is green chemistry? What are the current chemical industries? What are green processes?	5
6	RESEARCH BASED PEDAGOGY TOOLS Relate your master's subject with chemistry – this involves reading, presentation and design of an experiment (wet or dry lab) that can be demonstrated.	10

Sl. No.	References
1	Chemistry: Impact On Society:- Melwin D. Joesten, David O Johnston, John T. Netterville and James L. Wood, Saunders Golden Sunburst Series; Saunders College Publishing
2	The ESSENCE OF GASTRONOMY Understanding the Flavor of Foods and Beverages, Peter Klose CRC PressTaylor & Francis Group International Standard Book Number-13: 978-1-4822-1677-6 (eBook - PDF)
3	Biochemistry - Gareth and Grisham, Saunders College Publishing
4	New trends in green chemistry - Ahluwalia and Kidwai, Anamaya Publishers, New Delhi
5	Forensic Chemistry - Suzanne Bell - Pearson Publishers

OE - 3

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
DEPARTMENT OF COMPUTER SCIENCE	CSOE9121	Web Technologies	30	02

Course Objectives:

On successful completion of the course the students will be able to do the following:

- To provide an in-depth training for web development skills.
- To understand and develop I web pages independently.
- To understand the methods of debugging and correcting anomalies.
- To provide a proper foundation for learning other tools of web development.

Module No.	Content	No. of Hours
1	INTERNET BASICS Introduction to internet and its applications, working of the internet, E-mail, telnet, FTP, E-commerce, video conferencing. Internet service providers, domain name server, internet address, World Wide Web and its evolution, uniform resource locator (URL), browsers, search engine, web server, HTTP protocols.	6
2	WEB DESIGNING TECHNOLOGIES Introduction HTML – HTML editors, file creation, Basic HTML tags, text formatting, forms, images, lists, tables, linking documents, frame sets, lists and HTML layout elements.	10
3	CASCADING STYLE SHEETS Introduction to CSS, importance of CSS, Types: inline, internal and external with examples. Selector types: Element, id, class and overriding the styles, CSS box model.	7
4	JAVA SCRIPT Introduction to Java script, writing java script into HTML, Java Script Syntax, Variables, Data types, arrays - properties and methods, operators, expressions, programming constructs – conditional and looping statements, dialogue boxes, web page events.	7

Sl. No.	References
1	M. Srinivasan: Web Technology Theory and Practice, Pearson Education.
2	Jeffrey C. Jackson: Web Technologies- A Computer Science Perspective, Pearson Education, Eleventh Impression.
3	Chris Bates: Web Programming Building Internet Applications, 3rd Edition Wiley India.
4	Internet Technology and Web Design, Instructional Software Research and Development (ISRD) Group, Tata McGraw Hill.

OE - 4

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Economics	ECO9621	BASIC ECONOMICS FOR NON-ECONOMISTS	30	02

Course objectives:

- To introduce students to basic concepts and theories of economics
- To provide insights into the working of an economic system

Module No.	Content	No. of Hours
1	BASIC BUILDING BLOCKS OF ECONOMICS (12 Hours)	12
2	WORKING OF AN ECONOMY (6 Hours)	6
3	ROLE OF GOVERNMENT (6 Hours)	6
4	EXPORT IMPORT AND THE ECONOMY	3
5	ISSUES IN GROWTH AND DEVELOPMENT	3

Sl. No.	References
1	Hayne, Paul; Peter Boettke, and David L. Prychitk: The Economic Way of Thinking, 13 Edition
2	Mankiw Gregory: Macroeconomics. Worth Publishers, 7th Edition
3	Sen, A- Microeconomics: Theory and Applications, Oxford University Press (2000)
4	Todaro M.P. and Smith (1996) Economic Development, Addison-Wesley Series In Economics

OE - 5

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
English	ENOE 9718	MAKING IT UP; FICTION AND NON- FICTION FOR CHILDREN)	30	02

Course Objective: This 2-credit 30-hour course offers the taker an engagement with texts that are overtly aimed at children while also offering a practical understanding of writing both fiction and non-fiction for children. Three books will be taken up for discussion as part of the coursework.

Module No.	Content	No. of Hours
1	The idea of the child Perspectives from different fields. The child in different cultures. The child as reader	10
2	Fiction The Book of Dust—Philip Pullman Un Lun Dun—China Mieville	10
3	Non-Fiction Bulging Brains—Nick Arnold (can be replaced by other titles in the Horrible Science series) A Children's History of India—Subhadra Sen Gupta	10

Sl. No.	References
1	The Making of the Modern Child: Children's Literature in the Late Eighteenth Century- Andrew O'Malley
2	Centuries of Childhood- Philippe Ariès
3	The Pleasures of Children's Literature- Perry Nodelman

OE - 6

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Institute of Communication & Media Studies	MC OE 9521	Indian Cinema	30	02

COURSE OUTCOME: The course will give an overview of Indian cinema and its modes of theorization.

Module No.	Content	No. of Hours
1	History of Indian cinema: The Beginnings (1896-1912), The Silent Era (1913-1930), Growth of the Industry (1931-1947), Post-Independence Indian Cinema.	10
2	Representations in Indian cinema Gender, City and the Developmental Nation, Gender & Modernity in Alternative cinema, Neglected Auteurs and Suppressed Discourses, caste and cinema: the profiling of the Dalit.	10
3	Subalternity and The New Cinema Movement, Crisis of State in Popular and Alternative Cinema, Communalism and Terrorism.	10

Sl. No.	References
1	Rajadhyaksha, A. (2016). Indian cinema: A very short introduction.
2	Valicha, K. (1988). The moving image: A study of Indian cinema. Orient Longman Limited: Mumbai.
3	Vasudevan, R. (2010). The melodramatic public: Film form and spectatorship in Indian cinema. Raniket: Permanent Black.
4	Jain, M. (2009). Narratives of Indian cinema. Delhi: Primus Books.
5	Dwyer, R., & Patel, D. (2003). Cinema India: The visual culture of Hindi film. New Brunswick, NJ: Rutgers University Press

OE - 7

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Mathematics	MTOE 9722	Making the right decisions	30	02

Course Objective

To enhance the ability of a student to make decisions accurately and with confidence by providing them with principles of successful decision making.

Module No.	Content	No. of Hours
1	Choices. Determining Payoffs (What is in it for me?). Types of decision. Four major decision criteria: Admissibility criterion. Worst case scenarios. The long term perspective. Make hay while the sun shines (Maximax criterion). Guidelines in deciding which of the four criteria to use.	15
2	Acquisition and use of information. Decision involving other parties. Cooperative solutions. Vindictive Solutions.	15

Sl. No.	References
1	Miller James, Game theory of work, McGraw Hill, 2003.
2	Bradley Richard, Decision theory, A formal philosophical introduction, 2014.
3	North D. Warner, A Tutorial introduction to decision theory, IEEE Transaction on system science and cybernetics, vol ssc. so.3, section-1968.
4	Hansson Sven, Ove -Decision Theory, A Brief Introduction-Royal Institution of Technology, 2005.
5	Burger Starbird, The Heart of Mathematics, John Wiley and sons, New York, 2010.

OE -8

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Microbiology	MBOE 9521	Microbes and Us	30	02

Course Objectives : This elective draws our relationship closer to microbes. This relationship involves not only the beneficial effects but also familiarizes us with the harmful effects of certain microorganisms. Here we will bring to you the ways microbes affect our lives by causing diseases. We will also try and learn the measures to be taken to prevent the spread of microbial diseases and if affected to treat them. We will also examine the use of microbes in commercial and industrial applications to produce food, chemicals and drugs, to treat sewage, control pests and clean up pollutants.

Module No.	Content	No. of Hours
1	MICROBIAL DIVERSITY Introduction to microbiology and microbial biodiversity (bacteria, fungi, viruses – basic structure and examples), distribution, abundance, ecological niche, and types. Writing scientific names of microorganisms: binomial nomenclature	2
2	THE HUMAN MICROBIOME Human Microbiota, Gut Microflora, Maintaining and replenishing the Gut Microflora.	2
3	IMMUNITY Overview of innate and adaptive immunity	3
4	INFECTIOUS DISEASE & PREVENTION a. Definition of infection and disease. b. Classification of infections: localized, generalized, endemic, epidemic, sporadic, and pandemic. Classification of diseases as communicable and non-communicable with examples. c. Sources of infection: Air, humans, animals, insects, soil, water, and food. d. Methods of transmission of infection: Contact, inhalation, ingestion, inoculation, insects, congenital, iatrogenic, and laboratory infections. e. Causes, prevention, and treatment of infections /disease: HIV, Tuberculosis, Malaria, Candidiasis, and 1 recent outbreak f. Sterilization and Disinfection g. Vaccines and Immunization schedule h. Chemotherapy - Use and abuse	1 2 3 2 5 1 2 2
5	MICROBIAL PRODUCTS a. Microbiology of fermented milk products (acidophilus milk and yogurt) b. Microbiology of bread making and wine preparation c. Insulin. d. Compost.	5

Sl. No.	References
1	Robert S. Burlage, Ronald Atlas, David Stahl, Gill Geesey, Gary Sayler, 1998. Techniques in Microbial Ecology, Oxford University Press. N.Y.
2	Atlas and Bartha; Microbial Ecology.
3	Nester <i>et al</i> , 2004, Microbiology a human perspective, Mac Graw Hill Higher education.
4	Prescott, Harley & Klein's, (2008), Microbiology, Mac Graw Hill Higher education.
5	Staley, Jerome, Microbial life 2 nd edition (2007), Sinauer Associates inc, Massachusetts.
6	Casida, J.F. 1968. Industrial Microbiology, Wiley Eastern Ltd., New Delhi.
7	Cruger, W. and Crueger, A. 2000. Biotechnology: A Text Book of Industrial Microbiology, Second Edition, Panima Publishing Corporation, New Delhi.

OE - 9

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Physics	PHOE 9420	Astrophysics	30	02

Course Objectives:

This course attempts to introduce the student to Astrophysics by way images and simplified concepts. These are intended to strike a chord in the students to the larger idea of Scientific Methodology.

Scientific method dictates that we have “measurable” parameters associated with concepts that are studied. The student is walked through the “zoo” of astronomical objects: planets, stars, galaxies and so on. When the stars are then placed in the parameter space of these measured quantities, the student will see patterns arising in these pictures relating their age and size to their positions in this parameter space. In addition to this, the students will learn about the most successful model that describes the universe.

Module No.	Content	No. of Hours
1	A first glimpse of the universe	5
2	Birth and death of a star	10
3	Sun and the solar system	10
4	Our galaxy and beyond	5

Sl. No.	References
1	Astrophysics is easy – An introduction for the amateur astronomer, Mike Inglis
2	Astrophysics, in a nutshell, Dan Maoz
3	Fundamental astronomy, Hannu Karttunen et al.
4.	http://www.universe-review.ca/

OE - 10

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Political Science	PSOE0519	Readings in Indian Polity: Public Institutions and Challenges	30	02

Course Objectives:

The objective of the course is to engage and discuss some of the fundamental debates, arguments and concepts on Democracy in India, Political Parties, Election Commission and Electoral Process and the unique dimension of India's Federalism. The course will also cover a critical analysis of social movements, caste and class in Indian politics and political economy of development in India. Thus, the course offers a synoptic view of Indian politics by engaging with most of the raging themes and issues.

Module No.	Content	No. of Hours
1	A Historical and Contemporary Analysis of India's Democracy	06
2	Caste, Class and Ethnicity in Indian Politics	06
3	Election, Political Parties and Electoral Reforms	06
4	Federalism in India with special emphasis on Centre-State Relations	06
5	A Critical Enquiry into the Developmental Discourse of India	06

Sl. No.	References
1	Ambedkar, B R (2014) Annihilation of Caste: The annotated critical edition; New Delhi: Navayana
2	Ashankar, B. L. & Valerian Rodrigues, The Indian Parliament: A Democracy at Work, OUP: New Delhi.
3	Beteille, Andre, Antinomies of Society: Essays on Ideologies and Institutions, OUP: New Delhi.
4	Chatterjee, Partha (Ed.), 2004, State and Politics in India, OUP, New Delhi
5	Jayal, N. G. and Mehta, P. B. (2010) The Oxford Companion to Politics in India, OUP: New Delhi

OE -11

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Social Work	SWOE9921	HUMAN RIGHTS	30	02

Course Objectives:

- To give a basic awareness on human rights.
- To provide an overview of social legislation and familiarize students with Pertinent legislations
- To educate the students about the existing judicial system & it's functioning.

Module No.	Content	No. of Hours
1	Human Rights -Basic Concept <ul style="list-style-type: none"> • What are Human Rights? • Human Values- Dignity, Liberty, Equality, Justice, Unity in diversity, Ethics and Morals • Meaning and significance of Human Rights Education 	5
2	United Nations and Human Rights <ul style="list-style-type: none"> • Brief History of Human Rights- International and National Perspectives • Provision of the charters of United Nations • Universal Declaration of Human Rights-Significance- Preamble • Civil and Political Rights-(Art.1-21) • Economic, Social and Cultural Rights-(Art.22-28) • Duties and Limitations-(Art.29) • Final Provision (Art.30) 	10
3	Human rights of disadvantaged groups <ul style="list-style-type: none"> • Status of Indigenous People and the Role of the UN • Status of SC/ST and Other Indigenous People in the Indian Scenario • Human Rights of Aged and Disabled • The Minorities and Human Rights 	5
4	Human rights of vulnerable groups <ul style="list-style-type: none"> • Sex Workers • Migrant Workers • HIV/AIDS Victims 	5
5	Human Rights in Indian Context <ul style="list-style-type: none"> • Preamble- Fundamental Rights- Directive Principles- Fundamental Duties • Commission of Women, children, Minorities, SC/ST • Abuse of Executive Power-Corruption-Nepotism and favoritism 	5

	<ul style="list-style-type: none"> ● Role of Advocacy Groups: Professional Bodies: Press, Media ● Role of Lawyers, Educational Institutions, Role of Corporate Sector, NGO's. 	
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Sl. No.	References
1	Bare Acts. (n.d.). Retrieved from Advocate Khoj: https://www.advocatekhoj.com/library/bareacts/index.php
2	Chaudhary, J. (2012). Handbook of Human Rights. Wisdom Press.
3	Gangrade, K. D. (1978). Social Legislation in India. Concept Publishing Company.
4	Kulkarni, P. D. (1979). Social policy and social development in India. Association of Schools of Social Work in India.
5	Saiyed, I. A. (2015). Family Law. Himalayan Books.
6	Sharma, B. K. (2021). Introduction to the Constitution of India. PHI Learning Pvt.Ltd.
7	Singh, S. (2020). Encyclopedia of Social Work in India.
	<p>Documentaries for Review</p> <ol style="list-style-type: none"> 1) India Untouched 2) Prostitutes of God 3) Chakravyuh

OE -12

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
MCOM	COOE9721	Personal Financial Planning	30	02

Course Objectives:

- To provide a foundational understanding for making informed personal financial decisions.
- To give a complete outline of the various investment opportunities available for an investor and also provide a systematic input of knowledge to the students with regard to investments.

Module No.	Content
1	To provide a foundational understanding for making informed personal financial decisions
2	To give a complete outline of the various investment opportunities available for an investor and also provide a systematic input of knowledge to the students with regard to investments.
3	Understand the various range of financial assets and financial markets
4	Plan for the retirement planning process and quantifying needs in retirement
5	Comprehend the range of insurance products available and the need to assess priorities for protection

Sl. No.	References
1	Study guide for Personal Finance, Kapoor.
2	Avadhani. V. A, Security Analysis & Portfolio Management, Himalaya Publishing House
3	Personal Finance Simplified, Tycho Press, Callisto Media Inc
4	Prasanna Chandra, Investment Analysis & Portfolio Management, Tata McGraw Hill
5	Your Everyday Guide to Personal Finance and Insurance, Prakash Praharaj, CNBC

OE -13

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Food Science and Technology	FSTOE3522	Nutrition, Diet and Health	30	02

Course Objective:

Objective of the paper: To introduce the students to the fundamentals of nutrition, food and health and also to familiarize them with importance of nutrition during various stages of life.

Module No.	Content	No. of Hours
1	Terminologies related to nutrition: definition of nutrition, nutrients & energy, adequate, optimum & good nutrition, malnutrition. Diet & stress in current scenario. Food and Food Groups: Food production and consumption trends in India and their consequences on nutrition situation. Functions of food, Food guide - Basic five food groups, how to use food guide (according to R.D.A.)	8
2	Interrelationship between nutrition & health: Visible symptoms of goods health, Role of fibres in human nutrition. Macro and Micro Nutrients in Human Nutrition: Carbohydrates, lipids, proteins, vitamins, minerals and trace elements. Requirements, sources, functions and effects of deficiency and importance of nutraceutical, Qualitative differences in food proteins and Methods of assessing protein quality. Factors influencing availability of minerals. Nutrients inter-relationships. Water and electrolyte balance.	15
3	FSSAI initiative on Health & Nutrition on Eat Right Campus: Eat safe, Eat healthy & Eat sustainably, Food fortification and regulations by FSSAI, Concept of FoSTaC training (Food safety Training and Certification): training module for students as certified Food Safety Supervisors (FSSs), and faculty members as certified Master Trainers/National Level Resource Person (NLRP), Food nutrition programs to combat malnutrition strategies, targets and progress. Influence of junk food on health: School children and Youngsters in India.	7

Sl. No.	References
1	Chattopadhyay Ghosh S and Base N. (2015). Ucca MadhaymikKhadda O Pusti, Calcutta Book House.
2	Raut SK, Mitra K and Chowdhury P. Adhunik Pustibigyan, Book India Academic Publishers.
3	Arora K (2008). Theory of Cookery, Frank Brothers.
4	Srilakshmi B. (2018). Nutrition Science. New Delhi: New Age International.
5	Sahoo S and Sahoo SK. (2016). Pustibigyan, Kolkata: Chaya Prakashani.

OE -14

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Statistics	STOE 9620	Statistical Methods	30	02

Course Objective: To gain effective skills to perform data analysis using statistical tools and to identify potential areas of applications of statistical theory.

Module No.	Content	No. of Hours
1	Statistics: meaning and role as a decision-making science, Data-types, and scales of measurement. Presentation: tables, diagrammatic and graphical methods. Exploratory Data Analysis using descriptive measures and graphical tools. Univariate data Analysis: Measures of central tendency, positional averages, measures of dispersion, skewness, and kurtosis - Definition and properties.	07
2	Probability theory: random experiment, simple events, sample space - types of events, probability of an event, rules of probability, conditional probability, Bayes' theorem. Probability distributions: random variables - discrete and continuous type, Bernoulli, Binomial, Poisson, and normal distributions - applications.	07
3	Sampling methods - population and sample, parameter and statistic, the concept of a random sample, simple random sampling, stratified sampling, systematic sampling, and sample size determination.	05
4	Testing of hypothesis: null hypothesis, alternate hypothesis, test statistic, level of significance, p-value. Testing hypothesis about a population mean, tests for proportions. Contingency tables, chi-square test for independence of attributes.	05
5	Bivariate Analysis: Correlation: Scatterplot, correlation coefficient and its properties, rank correlation, Test for the correlation coefficient Regression: linear relationship, linear regression model, simple linear regression, fitting the regression model, coefficient of determination, Test for regression coefficients.	06

Sl. No.	References
1	Harry, F., and Steven C. (1997). Statistics: Concepts & Applications, Cambridge University Press
2	Medhi, J. (1992). Statistical Methods: An Introductory Text, Wiley Eastern Limited
3	D. A., Lind, W. C. Marchal, and S. A. Wathen (2012). Basic Statistics for Business and Economics, Mc Graw Hill, London.
4	Christopher Chatfield. (1981). Statistics for Technology, Chapman and Hall.
5	Sheldon M Ross (2007). Introductory Statistics, Elsevier.

OE -15

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
BIOTECHNOLOGY	BTOE9522	Transgenics and Bioethics	30	02

Unit	Content	Teaching Hours
Unit 1:	Introduction to GMOs	6 hours
	A brief history of recombinant DNA technology, the definition of GMOs, the biological concepts involved in genetic engineering and creation of GMOs, limitations of traditional breeding (focus on plants), and what kinds of problems are being addressed by the creation of GMOs, the GMO landscape.	
Unit 2:	Potential risks associated with GMOs	6 hours
	Concerns about GMOs: 'Natural' vs "Unnatural", Safety to human health, Risk to the environment, Superweeds and Superbugs, Damage to non-target insects, Herbicide-tolerant crops and dependence on herbicides, Corporate control of Agriculture, social and ethical implications. Risk and Uncertainty: Promises of new benefits versus potential for new risks.	
Unit 3:	Assessment of GMOs	6 hours
	The method of science, how scientific research is evaluated and published, peer review, scientific consensus, scientific reporting, science and ethical concerns, how to assess GMOs, regulatory frameworks, case study.	
Unit 4:	The politics of GMOs	6 hours
	Social movements and advocacy networks for and against GMOs in various countries, socio-political and cultural factors as reasons why societies/nations reject GMOs, intersection of politics and science in different national systems contexts, case study	
Unit 5:	Bioethics	6 hours

Sl. No.	References
1	Bioethics: Principles, Issues, and Cases, 4th ed, Lewis Vaughn, Oxford University Press; 3rd ed.
2	Review papers, blogs and articles that discuss GMOs will be provided as reading material.

OE -16

Department	Paper Code	Title of the Paper	No. of Hours	No. of Credits
Psychology	PYOE9521	Foundation and Application of Psychology	30	02

Module No.	Content	No. of Hours
1	Unit 1 – Introduction	(10 hours)
2	Unit 2 –Biological Processes and sensation	(12 hours)
3	Unit 3 –Perception, Memory, and thinking	(14 hours)
4	Unit 4 – Learning, Emotions, and motivation	(12 hours)
5	Unit 5 – Intelligence, gender, personality	(12 hours)

Sl. No.	References
1	Ciccarelli S K & Meyer G E (2008) Psychology Pearson Longman
2	Kalat J (2010) Introduction to Psychology.Cengage Learning
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NOTE: If any queries, can mail the CBCS coordinator.

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