



Since 1991

SENGUNTHAR ARTS AND SCIENCE COLLEGE
(Affiliated to Periyar University, Salem and Approved by AICTE, New Delhi)
An ISO 9001:2015 Certified Institution
Recognised under section 2(f) and 12(B) of the UGC Act 1956
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Tiruchengode – 637 205, Namakkal dt., Tamilnadu



1.2.1 CBCS/ Elective Courses

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dt: 16/5/2008.

xerox copy handover

dt: 16/5/2008.

TRANSLATION

From
Dr. V. Krishanakumar
Registrar (I/c)
Periyar University
Salem – 636 011.

To
Principals of all Colleges
Affiliated to Periyar University

PU/R/G/PU/2008

Date: 13.05.2008

Sir/Madam,

Sub: Periyar University, Salem-Implementation of choice based credit system (CBSE) from 2008-2009 - reg.

Ref: Letter number of Member Secretary of TamilNadu State Council for higher education-N.M.N.K.54/2008 on 05.05.2008

In Tamil Nadu State Council for higher education, member secretary has informed that CBSE pattern has been introduced for all the Universities and Colleges from 2008-2009 as per the resolution taken in Vice Chancellors consultative meeting. In this regard University has sent the details of new pattern of UG and PG courses.

Registrar

Encl: Particulars of choice based Credit System.


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2019 onwards

REVISED SYLLABUS

COURSE OF STUDY AND SCHEME OF EXAMINATION

SEMESTER – I

PART	STUDY COMPONENTS	COURSES	HOURS / WEEK	CREDITS
Part - I	Languages	Tamil or anyone of the modern (Indian or foreign) or classical Languages - I	6	3
Part - II	Languages	English - I	6	3
Part - III	Core - I	Principles of Management	5	4
	Core - II	Business Communication	5	4
	Allied - I	Business Mathematics and Statistics-I	6	4
Part -IV	Non major -I Value Education	Yoga	2	2
		Total	30	20

SEMESTER – II

PART	STUDY COMPONENTS	COURSES	HOURS / WEEK	CREDITS
Part - I	Languages	Tamil or anyone of the modern (Indian or foreign) or classical Languages - II	6	3
Part - II	Language	English - II	6	3
Part - III	Core - III	Organizational Behavior	5	5
	Elective - I	Financial Accounting	6	5
	Allied - II	Business Mathematics and Statistics-II	6	4
Part - IV	Non major -II	Environmental Studies	2	2
		Total	30	22

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SEMESTER – V

PART	STUDY COMPONENTS		COURSES			HOURS WEEK	CREDITS	
Part - III	Core -X		Business Policy and Strategy			5	5	
	Core - XI		Operations Research			6	4	
	Core -XII		Cost Accounting			6	5	
	Core - XIII		Fundamental of Research Methodology			5	4	
	Core - XIV		Management Information System			5	4	
	GROUP-A	GROUP-B	GROUP-C	GROUP-D	GROUP-E	HRSCR		
Electives -II	Service Marketing	Industrial Relations	Investment Management	Total Quality Management	Data Base Management System	4	4	
					Total	30	26	

SEMESTER – VI

PART	STUDY COMPONENTS	COURSES				HOURS/ WEEK	CREDITS	
Part -III	Core - XV	Business Environment				6	4	
	Core -XVI	Financial Institutions and Services				6	4	
	Core - XVII	Entrepreneurial Development				5	4	
	Core - XVIII	Project Work-Viva-voce				3	5	
	Core - XIX	Computer Application in Business - Theory - Practical				3 3	2 2	
	GROUP-A	GROUP-B	GROUP-C	GROUP-D	GROUP-E	HR	SCR	
Electives -III	Retail Marketing Management	Training & Development	Portfolio Management	Merchandising Management	E-Business	4	4	
Part V	Extension Activities					-	1	
Total						30	26	
	OVER ALL TOTAL					180	140	

Note :Modern or classical languages:

- i. Indian – Telugu, Kannda, Malayalam, Urdu and Hindi
- ii. Foreign – French
- iii. Classical - Sanskrit, Arabic & Persian

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SEMESTER – V

PART	STUDY COMPONENTS	COURSES			HOURS WEEK	CREDITS	
Part - III	Core -X	Business Policy and Strategy			5	5	
	Core - XI	Operations Research			6	4	
	Core -XII	Cost Accounting			6	5	
	Core - XIII	Fundamental of Research Methodology			5	4	
	Core - XIV	Management Information System			5	4	
	GROUP-A	GROUP-B	GROUP-C	GROUP-D	GROUP-E	HR	SCR
Electives -II	Service Marketing	Industrial Relations	Investment Management	Total Quality Management	Data Base Management System	4	4
					Total	30	26

SEMESTER – VI

PART	STUDY COMPONENTS	COURSES				HOURS/ WEEK	CREDITS	
Part -III	Core - XV	Business Environment				6	4	
	Core -XVI	Financial Institutions and Services				6	4	
	Core - XVII	Entrepreneurial Development				5	4	
	Core - XVIII	Project Work-Viva-voce				3	5	
	Core - XIX	Computer Application in						
		Business - Theory				3	2	
		- Practical				3	2	
	GROUP-A	GROUP-B	GROUP-C	GROUP-D	GROUP-E	HR	SCR	
Electives -III	Retail Marketing Management	Training & Development	Portfolio Management	Merchandising Management	E-Business	4	4	
Part V	Extension Activities					-		1
Total						30	26	
OVER ALL TOTAL						180	140	

Note :Modern or classical languages:

- i. Indian – Telugu, Kanada, Malayalam, Urdu and Hindi
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- iii. Classical - Sanskrit, Arabic & Persian

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SEMESTER - II
ELECTIVE COURSE - I
FINANCIAL ACCOUNTING

UNIT - I

Meaning and definition of accounting - Basic accounting concepts and convention- Accounting equations – Journal, Ledger, Subsidiary books - Trial balance.

UNIT - II

Final Accounts with adjustments -(Simple Problems Only).

UNIT- III

Hire purchase – methods of calculation of interest - Entries in the books of hire purchaser and hire vendor– Installment purchase – Entries in the books of purchaser and seller.

UNIT-IV

Bank reconciliation statement – Average due date – Accounts current.

UNIT- V

Depreciation accounting – Meaning - Advantages and disadvantages - Types of depreciation – straight line method-written down value method - annuity method – machine hour rate.

TEST BOOK

1. Gupta R.L., Advanced Accountancy – Sulthan Chand & Sons, NewDelhi.

REFERENCE BOOKS

1. ShuklaRL.,Grewal, T.S., Advanced Accountancy Vol. – I, Sulthan Chand & Sons, NewDelhi.
2. Tulsian P.C., Advanced Accountancy – TataMcGrawHill.
3. AmitabhaMukerjee Mohammed Anif – Modern Accounting – TataMcGrawHill.
4. T.S. Grewal, Double Entry Book – Keeping, Sulthan Chand & Sons, NewDelhi..
5. T.S. Reddy, A. Moorthy, Cost Accounting, Margam Publication, Chennai.

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SEMESTER V

ELECTIVE - II - GROUP – A SERVICE MARKETING

UNIT - I

Importance of services sector – Nature and types of services – Difference between services and goods marketing – services marketing triangle.

UNIT - II

Environment for services marketing – macro and micro environments – understanding service customers – models of service consumer behavior – customer expectations and perception – service quality and GAP model.

UNIT – III

Market segmentation and selection – service market segmentation – targeting and positioning.

UNIT- IV

Services marketing Mix – Need for expanded marketing mix – planning for services offer – pricing – promotion and distribution of services – management of people – process and physical evidence – matching demand for and supply of services.

UNIT- V

Service marketing applications – Marketing Of Financial, Hospitality, Hospital, Tourism And Educational Services – International Marketing Of Services And Gats.

REFERENCE BOOKS

1. Christopher, H. Lovelock, Services Marketing, Pearson Education India
2. Adrian Payne, Services Marketing, PHI
3. Zeithaml, V.A. & M.J. Bitner, Services Marketing
4. Rao, Services Marketing, Pearson Education India
5. Sinha, P.K. and Sahoo S.C. Services Marketing, HPH.
6. Ravishankar, Services Marketing, Lalvani.

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SEMESTER VI
ELECTIVE - III - GROUP - A
RETAIL MARKETING MANAGEMENT

UNIT – I

Definition of Retail Marketing — Features of Modern Retail Marketing –Importance of Retail Marketing – Types of Retail Marketing – Retail Marketing Mix.

UNIT – II

Functions of Retail Marketing - Buying - Assembling - Selling - Transporting.

UNIT – III

Storage and Warehousing – Risk Bearing – Retail Market Information – Grading and Standardization – Retail Market Function.

UNIT – IV

Buyer Behavior – Consumer Goods and Industrial Goods – Buyer Behavior Model – Factors Influencing Buyer Behavior - Market Segmentation – Need and Basis – Targeting – Positioning.

UNIT – V


Retail Sales Forecasting – Methods – Analysis and Application – Products – Classification – New Product Development Process – Product Life Cycle –Line and Product Mix Decision.

TEXT BOOK

Retail Marketing Management – David Gilbert, Perason Education.

REFERENCE BOOK

1. Golabal Marketing Management – Warren J. Keejan, Printice – Hall ofIndia.
2. Retail Management – Chetan Bajaj, RajnishTuli, Nidhi V Srivastav - Oxford UniversityPress.
3. Retailing Management – Michael Levy, Barton A Weitz and Ajay Pandit– McGrawHill.
4. Retailing Management – Text & Cases – SwapnaPradhan – McGrawHill.
5. Retail Marketing Management – David Gilbert – PearsonEducation.

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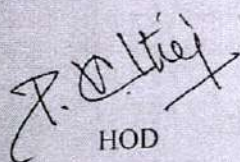


LIST OF ELECTIVES OFFERED FOR THE STUDENTS (2019 ONWARDS)


Department of Biotechnology

Degree/Branch/Semester: M.Sc., Biotechnology

Semester	Part	Subject Code	Subject
I	I	19PBTE01	Biophysics and Bioinstrumentation
	II	19PBTE02	Food and Agricultural Biotechnology
II	I	19PBTE03	Genomics and Proteomics
	II	19PBTE04	Pharmaceutical Biotechnology
III	I	19PBTE05	Bioinformatics, IPR, Bioethics & Biosafety
	II	19PBTE06	Plant and Animal physiology
IV	I	19PBTE07	Environmental Biotechnology and Nanotechnology
	II	19PBTE08	Bio-Entrepreneurship


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Department of Biotechnology

Degree/Branch/Semester: II M.Sc., Biotechnology (III Sem.)

Academic Year: 2020-2021 (Odd)

S. No.	Roll No.	Name of the Student	Elective offered by the University & Electives Opted by the Students		Student Signature
			Bioinformatics, IPR, Bioethics & Biosafety 19PBTE05	Plant and Animal physiology 19PBTE06	
1	19M1301	ABBUBAKKAR SIDDQ.A	/		Abbubakar
2	19M1302	AJITH KUMAR.P	/		Ajith P
3	19M1303	DHANAPAL.V	/		Dhanapal
4	19M1304	HARIPRASANTH.P	/		Hariprasanth
5	19M1305	KESAVAN.M	/		Kesavan
6	19M1306	MOGESHWARAN.S	/		Mogeshwaran
7	19M1307	MOHAMMED HASIM.S	/		Mohammed
8	19M1308	MOHAN KUMAR.S	/		Mohan Kumar
9	19M1309	MUTHUPANDI.S	/		Muthupandi
10	19M1310	SANDEEP.V	/		Sandeep
11	19M1311	SATHIS KUMAR.B	/		Sathis Kumar
12	19M1312	SIVA.S	/		Siva
13	19M1313	SURYA.S	/		Surya
14	19M1314	DEEPA.S	/		Deepa
15	19M1315	PAVITHRA.S	/		Pavithra
16	19M1316	PRIYA.M	/		Priya
17	19M1317	SHANTHIKAJI.K	/		Shanthikaji
18	19M1318	VANITHADEVLK	/		Vanitha
19	19M1319	VINOTHINI.R	/		Vinothini
20	19M1320	VISALYA.G	/		Visalya

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Department of Biotechnology

Degree/Branch/Semester: II M.Sc., Biotechnology (IV Sem.)
 Academic Year: 2020-2021 (Even)

S. No.	Roll No.	Name of the Student	Elective offered by the University & Electives Opted by the Students		Student Signature
			Environmental Biotechnology and Nanotechnology 19PBTE07	Bio-Entrepreneurship 19PBTE08	
1	19M1301	ABBUBAKKAR SIDDQ.A	/		Abbu
2	19M1302	AJITH KUMAR.P	/		Ajith.P
3	19M1303	DHANAPAL.V	/		Dhanapal
4	19M1304	HARIPRASANTH.P	/		Hp
5	19M1305	KESAVAN.M	/		Kesavan
6	19M1306	MOGESHWARAN.S	/		Mogeshwaran
7	19M1307	MOHAMMED HASIM.S	/		M.H.
8	19M1308	MOHAN KUMAR.S	/		mohankumar
9	19M1309	MUTHUPANDI.S	/		MUTHUPANDI
10	19M1310	SANDEEP.V	/		Sw
11	19M1311	SATHIS KUMAR.B	/		Sathiskumar
12	19M1312	SIVA.S	/		Siva
13	19M1313	SURYA.S	/		Surya
14	19M1314	DEEPA.S	/		Deepa
15	19M1315	PAVITHRA.S	/		Pavithra
16	19M1316	PRIYA.M	/		Priya
17	19M1317	SHANTHIKAIL.K	/		Shanti
18	19M1318	VANITHADEVI.K	/		Vanitha
19	19M1319	VINOTHINI.R	/		Vinothini
20	19M1320	VISALYA.G	/		G-v

[Signature]
 HOD 21/12/2021

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Department of Biotechnology

Degree/Branch/Semester: I M.Sc., Biotechnology (I Sem.)

Academic Year: 2020-2021 (Odd)

S. No.	Roll No.	Name of the Student	Elective offered by the University & Electives Opted by the Students		Student Signature
			Biophysics and Bioinstrumentat ion 19PBTE01	Food and Agricultural Biotechnology 19PBTE02	
1	20M1301	M.BALAJI	/	/	M. Balaji
2	20M1302	M.KRISHNA KUMAR	/	/	Krishnakumar
3	20M1303	A.NANDHA KUMAR	/	/	A. Nandhakumar
4	20M1304	S.NANDHAKUMAR	/	/	S. Nandhakumar
5	20M1305	D.RAGUL	/	/	D. Ragul
6	20M1306	S.RANJITH	/	/	S. Ranjith
7	20M1308	C.SARAVANAN	/	/	C. Saravanan
8	20M1309	R.SURESHRAJA	/	/	R. Suresh Raja
9	20M1310	S.KRISHNAPRABHA	/	/	S. Krishnaprabha
10	20M1311	E.THANISKA	/	/	E. Thaniska

F. D. Vijay
HOD 31/10/2019

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Department of Biotechnology

Degree/Branch/Semester: I M.Sc., Biotechnology (II Sem.)

Academic Year: 2020-2021 (Even)

S. No.	Roll No.	Name of the Student	Elective offered by the University & Electives Opted by the Students		Student Signature
			Genomics and Proteomics 19PBTE03	Pharmaceutical Biotechnology 19PBTE04	
1	20M1301	M.BALAJI	/		M. Balaji
2	20M1302	M.KRISHNA KUMAR	/		Krishnakumar
3	20M1303	A.NANDHA KUMAR	/		A. Nandhakumar
4	20M1304	S.NANDHAKUMAR	/		S. Nandhakumar
5	20M1305	D.RAGUL	/		D. Ragul
6	20M1306	S.RANJITH	/		S. Ranjith
7	20M1308	C.SARAVANAN	/		C. Saravanan
8	20M1309	R.SURESHRAJA	/		R. Suresh Raja
9	20M1310	S.KRISHNAPRABHA	/		S. Krishnaprabha
10	20M1311	E.THANISKA	/		E. Thaniska

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HOD 2/12/21



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**M.Sc. BIOTECHNOLOGY
SEMESTER -I**

ELECTIVE I – PAPER I

BIOPHYSICS AND BIOINSTRUMENTATION

UNIT I:

Scope and methods of Biophysics. Various bonding: structure and properties of water. Understanding various structure of proteins, globular and fibrous protein; protein stability; protein folding. The physics of nucleic acids: Forces stabilizing structures; Double helical structures; properties; helix – coil; transitions.

UNIT II

Spectroscopy Techniques: Beer-Lamberts law, UV- Visible, Raman and IR Spectroscopy. Theory and application of Circular Dichroism. Fluorimetry and its types. Fluorescence, NMR, PMR, ESR and Plasma Emission spectroscopy. Mass spectrometry-Matrix Assisted Laser Desorption Ionization and Surface Enhanced Laser Desorption Ionization.

UNIT III

Centrifugation: Basic principles- RCF, Sedimentation coefficient, Types of centrifuges, Preparative & Analytical centrifugation.

Chromatography Techniques: Principle and applications of Paper, Thin layer, LPCC, HPLC, Affinity, Gel permeation and Ion exchange chromatography.

UNIT IV

Electrophoretic techniques: Principle and applications of Poly acrylamide gel electrophoresis, Capillary electrophoresis, Isoelectric focusing, 2D Electrophoresis, Disc gel electrophoresis, Gradient electrophoresis, Pulsed field gel electrophoresis and Agarose gel electrophoresis.

Radiation Biophysics: Basic concept and measurement of radioactivity. Radioisotope techniques – GM Counter, Liquid scintillation and Solid scintillation counter.

UNIT V

Physical Biomedical method of Imaging techniques, Intact biological structures -X-ray, CAT, SCAN, ECG, EEG. Autoradiography, X ray crystallography, Photography, ultrasound, MRI, Angiography.

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M.Sc. BIOTECHNOLOGY

SEMESTER - I

ELECTIVE I - PAPER II

FOOD AND AGRICULTURAL BIOTECHNOLOGY

UNIT I:

Constituents of food and dietary sources of food – Carbohydrates, Lipids, Proteins, Water, Vitamins and Minerals. Extrinsic and intrinsic factors of food that affect microbial growth. Principles and methods of food preservation: Asepsis removal, High temperature, Low temperature, Drying, Irradiation, Chemical and Biopreservatives.

UNIT II

Food and beverage yeast: Bread, Alcoholic beverages-wine, beer. Dairy products – cheese. Meat, poultry and fish products. Vegetable and fruit products- Sauerkraut, Pickles. Microbial Pigments, SCP-bacteria, algae and fungi. Probiotics and prebiotic. Feed Additives: Monensin, phytases, carbohydrases, proteases, lipases, pectinase, xylanases, cellulase, Beta glucanase.

UNIT III

Raw material characteristics; cleaning, sorting and grading of foods; physical conversion operations - mixing, emulsification, extraction, filtration, centrifugation, membrane separation, crystallization, heat processing. Food sanitation, food control agencies and their regulations. Safety evaluation of novel food products.

UNIT IV

Microbes based Biofertilizers: Azolla and Anabena, Rhizobium, Azotobacter, Azospirillum, Mycorrhiza. Biochemistry of nitrogen fixation, Nif genes. Biopesticide – Trichoderma, Bt and NPV. Plant growth regulators from soil microbes.

UNIT V

Transgenic plants in quality modifications –Starch, Oil, Protein, and Golden Rice. Plants derived vaccines, flower modification and color. Advantages and applications of transgenic plants. Current status of transgenics, Biosafety norms and controlled field trails and release of transceins (GMO).

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M.Sc. BIOTECHNOLOGY
SEMESTER - II
ELECTIVE II - PAPER I
GENOMICS AND PROTEOMICS

UNIT I

Genome study: Genetic Mapping-Markers for genetic mapping; RFLP, SSLP-VNTR's, STR's, SNP's; Physical Mapping: In situ hybridization, Sequence Tagged sites mapping and DNA data bases.

UNIT II

Determination of nucleotide sequence: Chemical degradation method, Sanger's dideoxynucleotide synthetic method. Direct DNA sequencing using PCR, Sequencing by conventional shotgun method, Whole genome shot gun method, Clone contig method. Next generation sequencing.

UNIT III

ORF scanning: Codon bias, Exon-Intron boundaries-Exon trapping and CpG island. Gene location: Southern and Northern blotting hybridization and Zoo blotting. Transcriptome analysis- Microarray or chip- Data analysis, SAGE. Organization of genome projects- human, plant, animal and microbial genome.


UNIT IV

Proteomics: DNA polymorphisms as expressed in proteomes. Protein profiling, 2DGE, multidimensional chromatography, Quantitative Mass spectrometry- Peptide mapping, N & C terminal sequencing, and analytical protein chips-computational pattern, recognition of proteomes- protein networks and pathway. Protein structure prediction- homology modeling, fold recognition, comparison of 3D structures of protein, protein data banks.

UNIT V

Protein- protein interaction- domain fusion, gene neighbors, sequence homology, phylogenetic information and hybrid methods. Active site determination of enzymes; design of enzyme inhibitors- drug response. Application of proteomics in disease diagnosis -Biomarker, drug development and their target identification.

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M.Sc. BIOTECHNOLOGY

SEMESTER II

ELECTIVE II - PAPER II

PHARMACEUTICAL BIOTECHNOLOGY

UNIT I

Introduction to Pharmaceutical Biotechnology and Drug discovery. Drug targets- Structure and functions; Physiochemical properties of drugs; drugs from natural sources. Pharmacodynamics, pharmacokinetics and drug metabolism. Screening and isolation of bioactive compounds.

UNIT II

Adverse response to drugs, Drug tolerance, Drug intolerance, drug allergy, drug induced side effects. Tachyphylaxis, biological effects of drug abuse and drug dependence, vaccination against infection, factor that modifies the effect of drug. Assay of drug potency- bioassay and immunoassay.

UNIT III

Protein mode of action and pharmacodynamics- Overview of the mode of action of a biopharmaceutical Pre-clinical studies- -Toxicity (Reproductive toxicity and Teratogenicity, Mutagenicity, Carcinogenicity and Other tests); Clinical trials - Clinical trial design, Trial size design and study population.

UNIT IV

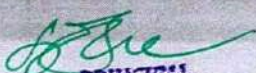
Biopharmaceutical and biological drug development, Manufacturing of biopharmaceutical, therapeutic proteins and peptides. Recombinant growth hormones, growth factors, therapeutic monoclonal antibodies, therapeutic enzymes and their application in health care.

UNIT V

Role and remit of regulatory authorities- The Food and Drug Administration (FDA), Investigational new drug application, New drug application; European regulations- National regulatory authorities, European medicines agency and the new EU drug approval system, Centralized procedure, Mutual recognition, Indian drug regulations & pharmacopeia.

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M.Sc. BIOTECHNOLOGY

SEMESTER - III

ELECTIVE III - PAPER I

BIOINFORMATICS, IPR, BIOETHICS & BIOSAFETY

UNIT I

Biological Databases: Nucleic Acid sequence Databases: Genbank, NCBI, EMBL, DDBJ; Protein Sequence Databases: Swiss Prot, PIR; Structural Data Bases: PDB, CATH, SCOP and specialized databases.

UNIT II

Tools for Bioinformatics: Pairwise alignment –Dotplots –scoring matrices –Blosum Matrices –PAM Matrix –Gap Penalty Alignment Algorithms: Needleman –Wunsch Global Alignment Algorithm ; Smith –Waterman Local Alignment Algorithm. Genome aligners- BLAST, MUMmer, WABA, Glass, Dialign, Avid, LAGAN and Multi LAGAN. Protein gene prediction method-ORF finder, restriction analysis, secondary structure prediction. Homology modeling and drug designing.

UNIT III

Introduction to IPR, WTO, GATT, TRIPS, WIPO – Establishment and function. Intellectual property Rights, definition and types. Patent, trademark, trade secret, copyright. Geographical indication and industrial design. Patents in Biotechnology. Plant Breeders and farmer rights. Patenting in India: Indian patent act.

UNIT IV


Bioethics- Ethical, Legal & Social Issues of Biotechnology. National & International issues on Genetic modification & recombinant DNA technologies, Release of GMO's in environment, Human embryonic cloning & stem cell research, transgenic plants and animals.

UNIT V

Biosafety-Introduction to biosafety and health hazards concerning biotechnology. Introduction to the concept of containment level, General guidelines for rDNA research. Good Laboratory Practices (GLP) and Good Manufacturing Practices (GMP).

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M.Sc. BIOTECHNOLOGY**SEMESTER III****ELECTIVE III - PAPER II - PLANT AND ANIMAL PHYSIOLOGY****UNIT I**

Photosynthesis- Light harvesting complex; Photoprotective mechanisms; CO_2 fixation-C3, C4 and CAM pathways. Sensory photobiology: Structure, function and mechanisms of action of phytochromes, cryptochromes and phototropins; stomatal movement; photoperiodism and biological clocks.

UNIT II

Uptake, transport and translocation of water, ions, solutes and macromolecules from soil, through cells, across membranes, through xylem and phloem; transpiration; mechanisms of loading and unloading of photoassimilates.

UNIT III

Responses of plants to biotic (pathogen and insects) and abiotic (water, temperature and salt) stresses; mechanisms of resistance to biotic stress and tolerance to abiotic stress.

UNIT IV

Respiratory system: anatomy and structure transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration. Digestive system: Digestion, absorption, energy balance, BMR.

UNIT V

Excretory system: Comparative physiology of excretion, kidney, urine formation, urine concentration, waste elimination, micturition, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance. Endocrinology and Reproduction- Endocrine glands, basic mechanism of hormone action, hormone and diseases, neuroendocrine regulation.

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M.Sc. BIOTECHNOLOGY
SEMESTER - IV
ELECTIVE IV - PAPER I
ENVIRONMENTAL BIOTECHNOLOGY AND
NANOTECHNOLOGY

UNIT I

Basic concepts and global issues-Global warming & Acid rain. Pollution measurements- air and water. Biosensor in environmental monitoring. Bioremediation of environmental pollutants in soil and water- oils, heavy metals and detergents. Biodegradation of xenobiotics- Ecological considerations, decay behavior and degradative plasmids, hydrocarbon, hydrocarbon substitutes, pesticides and surfactants. Phytoremediation.

UNIT II

Air pollution and its control through biotechnology. Waste water treatment: Physical, chemical and biological treatment processes. Various industrial effluent treatment methods- Sugar, distillery, dairy, tannery and pharmaceutical industries. Solid wastes: Types and characteristics. Solid waste disposal- land filling, incineration. Biogas from solid waste. Composting and vermicomposting. Monitoring parameters for composting.

UNIT III

Nanobiology- Concepts, definition & prospects. Classification of Nanostructures- Bionanoparticles & nanocomposites. Types of biomaterials & biodegradable polymers. Applications of nanomaterials - Catalysis in dye & heavy metal removal, cosmetics, batteries, biosensor, food, agriculture, energy, tissue engineering (wound healing). Nanobiotechnology in medicine, drug designing & cancer treatment.

UNIT-IV

Synthesis of nanomaterials- bottom-up approach- Sol-Gel synthesis, hydrothermal, Physical vapor deposition, chemical vapor deposition, top-down approach -ball milling, microfabrication, lithography-iron beam lithography.

UNIT-V

Characterization techniques- X-ray diffraction, Electron Microscopy -Scanning & Transmission, Energy dispersive analysis, Scanning Probe Microscopy, Atomic Force Microscopy, X-ray photo electron Spectroscopy, Fourier transform Infrared spectroscopy - Ultraviolet and visible spectroscopy- Thermogravimetric Analysis- Differential Thermal Analysis- Differential Scanning Calorimetry.

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M.Sc. BIOTECHNOLOGY
SEMESTER - IV
ELECTIVE IV - PAPER II
BIO-ENTREPRENEURSHIP

UNIT I

Principles of management: Introduction, definition -principles and decisions on starting a venture; sources of financial assistance - making a business proposal, approaching loan from bank and other financial institutions, budget planning and cash flow management, basics in accounting practices - balance sheet, P&L account, and double entry book keeping; estimation of income, expenditure, profit, income tax etc.

UNIT II

Human Resource Development (HRD): Recruitment and selection process; leadership skills; managerial skills; organization structure; training; team building; teamwork; Marketing: Assessment of market demand for potential product(s) of interest; Market conditions, segments; prediction of market changes; identifying needs of customers including gaps in the market.

UNIT III

Entrepreneur: Meaning of entrepreneur, evaluation of the concept, function of an entrepreneur types of entrepreneur, evolution of entrepreneurship, development of entrepreneurship, stages in entrepreneurial process, role of entrepreneurs in economic development entrepreneurship in India, entrepreneurship - its barriers.

UNIT IV

Small Scale Industry: Definition, characteristics, need and rationale, objectives, scope, role of SSI in economic development, advantages of SSI, steps to start an SSI - Govt policy towards SSI, different policies of SSI, Govt support for SSI during 5 year plans. Impact of liberalization, privatization, globalization on SSI, effect of WTO/ GATT, supporting agencies of Govt for SSI, meaning; nature of support, objectives, and functions, types of help, ancillary industry and tiny industry (Definition only).

UNIT V

Institutional Support: Different Schemes, TECKSOK, KIADB, KSSIDC, KSIMC, DIC single window Agency SISI, NSIC, SIDBI, KSFC. Preparation of Project-Meaning of Project; Project Identification Project Selection. Project Report, Need and significance of Report, Contents, Formulation Guidelines by Planning Commission for Project report; Network Analysis; Errors of Project Report, Project Appraisal, Identification of Business Opportunities. Market Feasibility Study, Technical Feasibility study, Financial Feasibility Study & Social Feasibility study.

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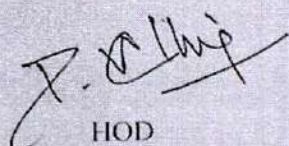


LIST OF ELECTIVES OFFERED FOR THE STUDENTS (2017 ONWARDS)


Department of Biotechnology

UG Biotechnology

Semester	Part	Subject Code	Subject
V	III	17UBTE01	Stem cell and Tissue Engineering
		17UBTE02	Clinical Biotechnology
VI	III	17UBTE03	Food Biotechnology
		17UBTE04	Endocrinology


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Department of Biotechnology

Degree/Branch/Semester: III B.Sc., Biotechnology A ; V Semester

Academic Year: 2020-2021 (Odd)

S. No.	Roll No.	Name of the Student	Elective offered by the University & Electives Opted by the Students		Student Signature
			Stem cell and Tissue Engineering 17UBTE01	Clinical Biotechnology 17UBTE02	
1	18BA1201	AJITHKUMAR.G	✓		<i>Ajith</i>
2	18BA1203	BHARATHI.S	✓		<i>Bharathi</i>
3	18BA1205	GOWTHAM.V	✓		<i>Gowtham</i>
4	18BA1206	JEEVANANTHAM.K	✓		<i>Jeevanantham</i>
5	18BA1207	KANNAN.K	✓		<i>Kannan</i>
6	18BA1208	KANNAN.S	✓		<i>S. Kannan</i>
7	18BA1209	KARTHIK.V	✓		<i>Karthik</i>
8	18BA1210	KUMARESAN.S	✓		<i>Kumaresan</i>
9	18BA1211	MANI.P		✓	<i>P. Mani</i>
10	18BA1212	MANIKANDAN.K	✓		<i>Manikandan</i>
11	18BA1213	MOHANRAJ.P	✓		<i>Mohan</i>
12	18BA1214	NANDHAGOPAL.M	✓		<i>Nandhagopal</i>
13	18BA1215	RAJESH KUMAR.T	✓		<i>Rajesh</i>
14	18BA1216	RANJITHKUMAR.A	✓		<i>Ranjith</i>
15	18BA1217	RAVIKUMAR.G	✓		<i>Ravikumar</i>
16	18BA1218	SARANRAJ.S	✓		<i>Saranraj</i>
17	18BA1219	SATHISH KUMAR.P	✓		<i>Long Absent</i>
18	18BA1220	TAMILMANI.K	✓		<i>Sathishkumar</i>
19	18BA1221	TAMILSELVAN.S	✓		<i>Tamilmani</i>
20	18BA1222	VASANTHARAJ.S	✓		<i>Thelvan</i>
21	18BA1223	VIJAY.P	✓		<i>Vasantharaj</i>
22	18BA1224	YUVARAJ.P	✓		<i>P. VIJAY</i>
23	18BA1225	AISHWARYA.U	✓		<i>Yuvaraj</i>
24	18BA1226	ARCHANA.S	✓		<i>U. Aishwarya</i>
25	18BA1227	DHIVYABHARATHI.J	✓		<i>Archana</i>
26	18BA1228	GOKULAPRIYA.M	✓		<i>DB</i>
27	18BA1229	GOWSHIKA.V	✓		<i>Gokulapriya</i>
28	18BA1230	KAVIRANJANI.M	✓		<i>Gowshika</i>
					<i>Kaviranjani</i>

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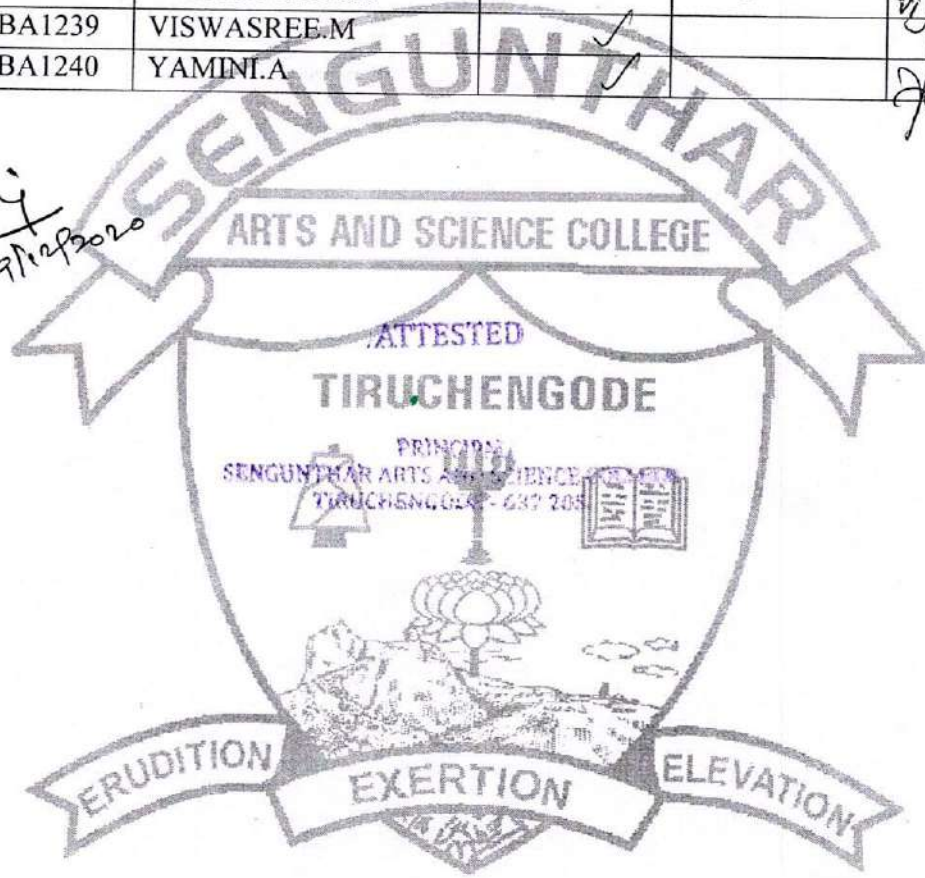
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29	18BA1231	KEERTHANA.J	✓		Keerthana
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31	18BA1233	MANISHA.R	✓		Manisha
32	18BA1234	MENAKA.K.	✓		Menaka
33	18BA1235	MOHANACHANDRIK A.R	✓		Mohana
34	18BA1236	PAVTHRA.S	✓		Pavithra
35	18BA1237	VAISHALI.K	✓		Vaishali
36	18BA1238	VIJAYAPRIYA.B		✓	Vijayapriya
37	18BA1239	VISWASREE.M	✓		Viswasree
38	18BA1240	YAMINI.A	✓		Yamini

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HOD 29/12/2020



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			Food Biotechnology 17UBTE03	Endocrinology 17UBTE04	
1	18BA1201	AJITHKUMAR.G	✓		Ajith
2	18BA1203	BHARATHI.S	✓		Bharathi
3	18BA1205	GOWTHAM.V	✓		Gowtham
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14	18BA1216	RANJITHKUMAR.A	✓		Ranjith
15	18BA1217	RAVIKUMAR.G	✓		Ravi
16	18BA1218	SARANRAJ.S	✓		Saranraj
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28	18BA1230	KAVIRANJANIM	✓		Kaviranjani

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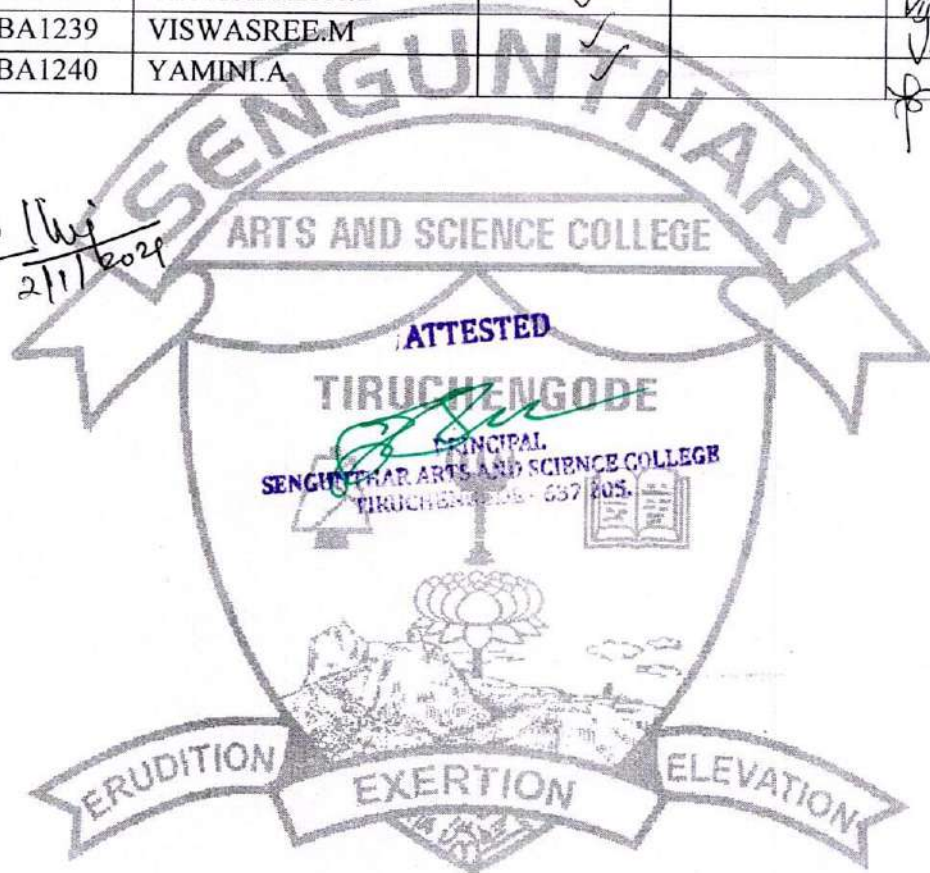
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38	18BA1240	YAMINI.A	✓		✓

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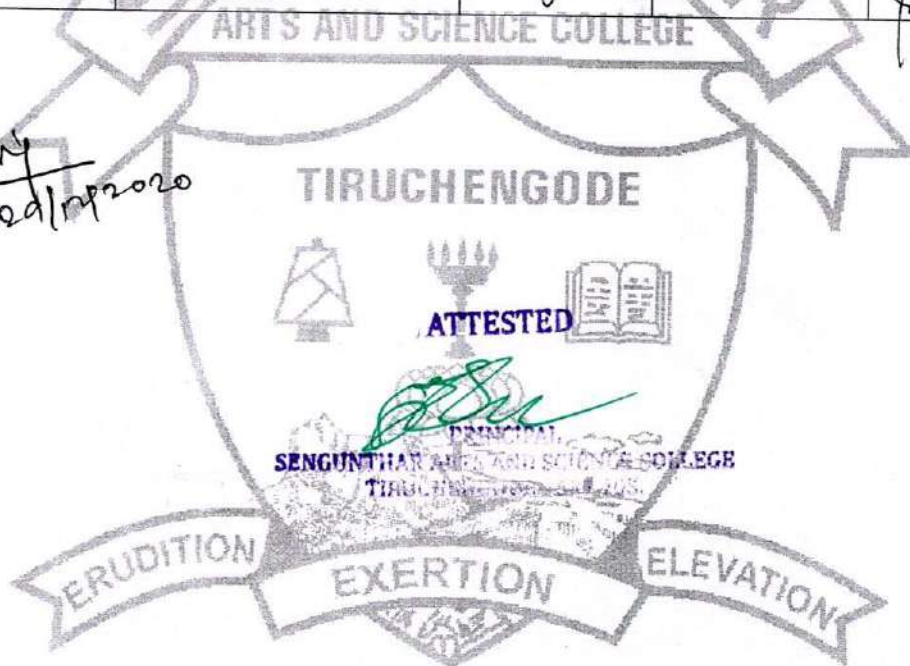
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37	18BB1237	SHALINI.B.S	✓		Shalini B.S
38	18BB1238	SUBHASHINI.S	✓		Subhashini
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27	18BB1227	DIVYAPARAMESHWARI.	✓		Divyaparameshwari

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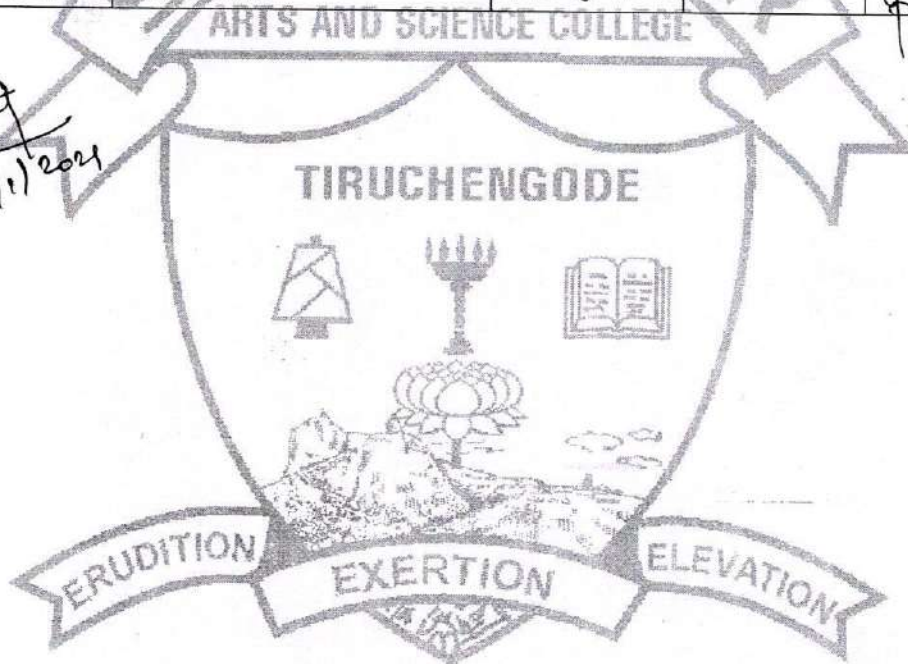
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