SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi & Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107

SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF BIOSCIENCE

B.Sc. MICROBIOLOGY

Minutes of Board of Studies First Meeting

Venue

Hall No.203, School of Arts and Science Block

Date and Time

9.8.2022 from 10.30 am to 12.30 pm

2.E.22.1

Q.E.22.2

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

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SCHOOL OF ARTS AND SCIENCE

BOARD OF STUDIES ON B.Sc. MICROBIOLOGY

Minutes of Board of Studies First Meeting

The Board of Studies first meeting of the Department of Biosciences for B.Sc. Microbiology Programme was held on 9.8.2022 from 10.30 am to 12.30 pm through online mode at the Hall No.203, School of Arts and Science Block, Sri Manakula Vinayagar Engineering College (Autonomous), Puducherry.

The following members were present for the BoS meeting

SL. NO	NAME OF THE MEMBER WITH DESIGNATION AND OFFICIAL ADDRESS	MEMBERS AS PER UGC NORMS
1	**Dr.T.R.Rajaram** Assistant Professor & HOD Department of Bioscience - Microbiology School of Arts and Science, SMVEC, Pondicherry hodbiotech@smvec.ac.in 8220765723	Chairman
2	**Prof. Daman Saluja** Joint Director Delhi School of Claimate Changes & Sustainability Delhi dsalujach1959@gmail.com 9310018699	Subject Expert (University Nominee)
3	**Dr. T.Ramanathan** Associate Professor CAS in Marine Biology Annamali University, Chidanbaram drtramanathan@gmail.com 9894175200	Subject Expert (Academic Council Nominee)
4	**Dr. A.Rajasekar** Professor Department of Biotechnology Thiruvalluvar University Vellore rajasekargoog@gmail.com 7639186598	Subject Expert (Academic Council Nominee)
4	**Dr.Joseph Selvin** Professor Department of Microbiology Pondicherry University, Pondicherry josephselvinss@gmail.com 9944263367	Subject Expert (Co-opt Member)
5	**Dr.Agiesh Kumar** Deputy Director, Central Inter- Disiplinary Research Facility, Sri Balaji Vidyapeeth Deemed to be University, Pondicherry agiesh.b@gmail.com 8220028031	Subject Expert (Industry & Research Expert)
6	**Dr.R. Rajenderan** Assistant Professor & HOD Department of Tamil School of Arts and Science, SMVEC, Pondicherry 8608003285	Internal Member

2.E.22.3

7	**Dr.M.A.Ishrath Jahan** Professor & HOD Department of English School of Arts and Science, SMVEC, Pondicherry 9443075126	Internal Member
8	**Ms.A.Yuvarani** Assistant Professor Department of Bioscience School of Arts and Science, SMVEC, Pondicherry 7708270796	Internal Member

2.E.22.4

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SCHOOL OF ARTS AND SCIENCE
BOARD OF STUDIES ON B.Sc. MICROBIOLOGY
Agenda of the Meeting on 9.8.2022

S.NO	ITEM NO.	AGENDA
1	Item No.: BoS/2022/SAS/UG/MB 1.1	Welcome address, Introduction about the Institution, Department and BoS Members.
2	Item No.: BoS/2022/SAS/UG/MB 1.2	To discuss about the Structure of Undergraduate Programme and Credit distribution under Autonomous Regulations 2020
3	Item No.: BoS/2022/SAS/UG/MB 1.3	To discuss about the Curriculum Structure of B.Sc. Microbiology
4	Item No.: BoS/2022/SAS/UG/MB 1.4	To discuss about the Syllabi for I and II semester for B.Sc. Microbiology
5	Item No.: BoS/2022/SAS/UG/MB 1.5	To discuss about the evaluation systems • Continuous Assessment Tests (CAT) • Model Exam • End Semester Examinations (ESE) • Question paper pattern • Marks requirement to pass the course • Grade Point Average (GPA)

9.8.22.5

Minutes of Meeting

The meeting deliberated on the agenda items that have been approved by the Chairman.

Item No.: BoS/2022/SAS/UG/MB 1.1	Welcome address, Introduction about the Institution, Department and BoS Members. • Chairman of BoS gave the welcome address and introduction about the Institution and Department. • Chairman of BoS introduced the BoS members.
Item No.: BoS/2022/SAS/UG/MB 1.2	To discuss about the Structure of Undergraduate Programme and Credit distribution under Autonomous Regulations 2020 • The Board forwarded their suggestions. • The Panel appreciated the Structure of Undergraduate Programme and Credit distribution.(Refer Annexure – I)
Item No.: BoS/2022/SAS/UG/MB 1.3	To discuss about the Curriculum Structure of B.Sc. Microbiology • The Panel appreciated the Curriculum.(Refer Annexure – II)
Item No.: BoS/2022/SAS/UG/MB 1.4	To discuss about the Syllabi for I and II semester for B.Sc. Microbiology • The Syllabus of B.Sc. Microbiology Program was discussed and approved by panel of BoS members. (Refer Annexure – III) • In part I language (I and II semester) the students can opt Tamil/ French. • The syllabus meets the requirements of Microbiology Industries. • The panel appreciated the unique features of Curriculum: Skill Enhancement Course, Employability Enhancement Course which was incorporated in the Curriculum.
Item No.: BoS/2022/SAS/UG/MB 1.5	To discuss about the evaluation systems • Continuous Assessment Tests (CAT) • Model Exam • End Semester Examinations (ESE) • Question paper pattern • Marks requirement to pass the course • Grade Point Average (GPA) The Panel appreciated the approved the same.

The meeting concluded at 12.30 pm with vote of thanks.

2.E.22.6

The Minutes of the Meeting of the First Board of Studies of the Department of Biosciences- B.Sc. Microbiology was held on 9-8-2022 is signed by the members who attended the meeting:

S.No	Name of the Member with Designation and official Address	Members as per UGC norms	Signature
1	**Dr.T.R.Rajaram** Assistant Professor & HOD Department of Bioscience - Microbiology School of Arts and Science, SMVEC, Pondicherry hodbiotech@smvec.ac.in 8220765723	Chairman	
2	**Prof. Daman Saluja** Joint Director Delhi School of Claimate Changes & Sustainability Delhi dsalujach1959@gmail.com 9310018699	Subject Expert (University Nominee)	
3	**Dr. T.Ramanathan** Associate Professor CAS in Marine Biology Annamali University, Chidanbaram drtramanathan@gmail.com 9894175200	Subject Expert (Academic Council Nominee)	(T. RAMANATHAN)
4	**Dr. A.Rajasekar** Professor Department of Biotechnology Thiruvalluvar University, Vellore rajasekargoog@gmail.com 7639186598	Subject Expert (Academic Council Nominee)	
5	**Dr.Joseph Selvin** Professor Department of Microbiology Pondicherry University, Pondicherry josephselvinss@gmail.com 9944263367	Subject Expert (Co-opt Member)	
6	**Dr.Agiesh Kumar** Deputy Director, Central Inter- Disiplinary Research Facility, Sri Balaji Vidyapeeth Deemed to be University, Pondicherry agiesh.b@gmail.com 8220028031	Subject Expert (Industry & Research Expert)	
6	**Dr.R. Rajenderan** Assistant Professor & HOD Department of Tamil School of Arts and Science, SMVEC, Pondicherry 8608003285	Internal Member	
7	**Dr.M.A.Ishrath Jahan** Professor & HOD Department of English School of Arts and Science, SMVEC, Pondicherry 9443075126	Internal Member	
8	**Ms.A.Yuvarani** Assistant Professor Department of Bioscience School of Arts and Science, SMVEC, Pondicherry 7708270796	Internal Member	

HOD DEAN SAS

2.8.22.7

Annexure – I

STRUCTURE FOR UNDERGRADUATE PROGRAMME

S. No	Course Category	Break down of Credits
1	Language Modern Indian Language (MIL)	6
2	English (ENG)	6
3	Discipline Specific Core Courses(DSC)	74
4	Discipline Specific Elective Courses (DSE)	12
5	Inter-Disciplinary Courses(IDC)	24
6	Skill Enhancement Courses(SEC)	14
7	Employability Enhancement Courses(EEC*)	-
8	Ability Enhancement Compulsory Courses(AECC)	4
9	Open Elective(OE)	4
10	Extension Activity(EA)	1
	Total	**145**

SCHEME OF CREDIT DISTRIBUTION

S. No	Course Category	Credits per Semester						Total Credits
		I	II	III	IV	V	VI	
1	Language Modern Indian Language (MIL)	3	3	-	-	-	-	6
2	English (ENG)	3	3	-	-	-	-	6
3	Discipline Specific Core Courses(DSC)	10	10	10	10	16	18	74
4	Discipline Specific Elective Courses (DSE)	-	-	3	3	3	3	12
5	Inter-Disciplinary Courses(IDC)	6	6	6	6	-	-	24
6	Skill Enhancement Courses(SEC)	2	2	2	2	2	4	14
7	Employability Enhancement Courses(EEC*)	-	-	-	-	-	-	-
8	Ability Enhancement Compulsory Courses(AECC)	2	2	-	-	-	-	4
9	Open Elective(OE)	-	-	2	2	-	-	4
10	Extension Activity(EA)	-	1	-	-	-	-	1
	Total	26	27	23	23	21	25	**145**

**** EEC will not be included for the computation of "Total of Credits " as well as "CGPA"***

Annexure – II

S.No	Course Code	Course Title	Category	Periods L	T	P	Credits	Max.Marks CAM	ESM	Total
SEMESTER–I										
Theory										
1	A20TAT101 A20FRT101	Tamil-I/French-I	MIL	3	0	0	3	25	75	100
2	A20GET101	General English –I	ENG	3	0	0	3	25	75	100
3	A20BTT101	Cell biology	DSC	4	0	0	4	25	75	100
4	A20BTT102	Biochemistry - I – Biomolecules	DSC	4	0	0	4	25	75	100
5	A20MBD101	Basic Microbiology	IDC	3	1	0	4	25	75	100
Ability Enhancement Compulsory Course										
6	A20AET101	Environmental Studies	AECC	2	0	0	2	100	0	100
Practical										
7	A20BTL103	Cell biology and Biomolecules Practical	DSC	0	0	4	2	50	50	100
8	A20MBL102	Basic Microbiology Practical	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20MBS101	Communication Skills Lab	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
10	A20MBC101	Certification course –I	EEC	2	0	2	0	100	0	100
							26	**525**	**475**	**1000**

S. No.	Course Code	Course Title	Category	Periods L	T	P	Credits	Max.Marks CAM	ESM	Total
SEMESTER– II										
Theory										
1	A20TAT202 A20FRT202	Tamil-II/French-II	MIL	3	0	0	3	25	75	100
2	A20GET202	General English-II	ENG	3	0	0	3	25	75	100
3	A20MBT201	Microbial Diversity	DSC	4	0	0	4	25	75	100
4	A20MBT202	Analytical Technique in Microbiology	DSC	4	0	0	4	25	75	100
5	A20MBD203	Microbial Physiology	IDC	3	1	0	4	25	75	100
Ability Enhancement Compulsory Course										
6	A20AET202	Public Administration	AECC	2	0	0	2	100	0	100
Practical										
7	A20MBL203	Microbial Diversity and Analytical Technique in Microbiology Practical	DSC	0	0	4	2	50	50	100
8	A20MBL204	Microbial Physiology Practical	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
9	A20MBS202	Medical Laboratory Technology	SEC	0	0	4	2	100	0	100
Extension Activities										
10	A20EAL201	National Service Scheme	EA	0	0	2	1	100	0	100
Employment Enhancement Course										
11	A20MBC202	Certification course- II	EEC	2	0	2	0	100	0	100
							27	**625**	**475**	**1100**

2.E.22.9

SEMESTER – III										
S. No	Course Code	Course Title	category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20MBT304	Virology	DSC	4	0	0	4	25	75	100
2	A20MBT305	Molecular Biology and Genetics	DSC	4	0	0	4	25	75	100
3	A20MBD305	Food Analysis and Quality control	IDC	3	1	0	4	25	75	100
4	A20MBE3XX	DSE-I	DSE	3	0	0	3	25	75	100
5	A20XXO3XX	Open Elective–I	OE	2	0	0	2	25	75	100
Practical										
6	A20MBL306	Virology and Molecular Biology and Genetics Practical	DSC	0	0	4	2	50	50	100
7	A20MBL307	Food Analysis and Quality control Practical	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20MBS303	Soft Skills Lab	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20MBC303	Certification course- III	EEC	2	0	2	0	100	0	100
							23	**425**	**475**	**900**

SEMESTER– IV										
S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20MBT408	Genetic Engineering and R- DNA Technology	DSC	4	0	0	4	25	75	100
2	A20BTT411	Immunology	DSC	4	0	0	4	25	75	100
3	A20MAD409	Biostatistics	IDC	3	1	0	4	25	75	100
4	A20MBE4XX	DSE-II	DSE	3	0	0	3	25	75	100
5	A20XXO4XX	Open Elective– II	OE	2	0	0	2	25	75	100
Practical										
6	A20MBL409	Genetic Engineering and Immunology Practical	DSC	0	0	4	2	50	50	100
7	A20MAL404	Biostatistics Practical	IDC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20MBS404	Research Methodology	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20MBC404	Certification course- IV	EEC	2	0	2	0	100	0	100
							23	**425**	**475**	**900**

2.E.22.10

SEMESTER–V										
S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20MBT510	Food Microbiology	DSC	3	1	0	4	25	75	100
2	A20MBT511	Industrial Microbiology	DSC	3	1	0	4	25	75	100
3	A20MBT512	Agricultural Microbiology	DSC	3	1	0	4	25	75	100
4	A20MBE5XX	DSE-III	DSE	3	0	0	3	25	75	100
Practical										
5	A20MBL513	Food Microbiology and Industrial Microbiology Practical	DSC	0	0	4	2	50	50	100
6	A20MBL514	Agricultural Microbiology Practical	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20MBS505	In-Plant training / Internship	SEC	0	0	4	2	100	0	100
							21	**300**	**400**	**700**

SEMESTER–VI										
S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20MBT615	Medical Microbiology	DSC	3	1	0	4	25	75	100
2	A20MBT616	Environment Microbiology	DSC	3	1	0	4	25	75	100
3	A20BTT620	Biosafety, Bio-ethics and IPRs	DSC	3	1	0	4	25	75	100
4	A20MBT617	Pharmaceutical Microbiology	DSC	3	1	0	4	25	75	100
5	A20MBE6XX	DSE- IV	DSE	3	0	0	3	25	75	100
Practical										
6	A20MBL618	Medical Microbiology and Environment Microbiology Practical	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
7	A20MBS606	R & D and Bioentrepreneurship	SEC	4	0	0	2	100	0	100
8	A20MBS607	Seminar presentation	SEC	4	0	0	2	100	0	100
							25	**375**	**425**	**800**

2.E.22.19

DISCIPLINE SPECIFIC ELECTIVE COURSES

DISCIPLINESPECIFICELECTIVES										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Discipline Specific Electives (DSE - I) - offered in Third Semester										
1	A20MBE301	General Biology	DSE	3	0	0	3	25	75	100
2	A20MBE302	Bacteriology	DSE	3	0	0	3	25	75	100
3	A20MBE303	Medical Parasitology	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - II) - offered in Fourth Semester										
1	A20MBE404	Computer Application in Biology	DSE	3	0	0	3	25	75	100
2	A20MBE405	Public Health Microbiology	DSE	3	0	0	3	25	75	100
3	A20MBE406	Clinical and Diagnostic Microbiology	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - III) - offered in Fifth Semester										
1	A20MBE507	Enzymology	DSE	3	0	0	3	25	75	100
2	A20MBE508	Genomics and Proteomics	DSE	3	0	0	3	25	75	100
3	A20MBE509	Marine Microbiology	DSE	3	0	0	3	25	75	100
Discipline Specific Electives (DSE - IV) - offered in Sixth Semester										
1	A20MBE610	Applied Microbiology	DSE	3	0	0	3	25	75	100
2	A20MBE611	Basic Biotechnology	DSE	3	0	0	3	25	75	100
3	A20MBE612	Bioinformatics	DSE	3	0	0	3	25	75	100

2.E.22.12

OPEN ELECTIVE COURSES

Open Elective – I (Offered in Semester III)				
Sl. No	**Course Code**	**Course Title**	**Offering Department**	**Permitted Departments**
1	**A20BTO301**	Biotechnology for human welfare	Bioscience	Chemistry, Computational Studies, English, Food Science, Mathematics, Media Studies, Physics, Commerce and Management
2	**A20BTO302**	Food Processing	Bioscience	Chemistry, Computational Studies, English, Food Science, Mathematics, Media Studies, Physics, Commerce and Management
3	**A20BTO303**	Food Technology	Bioscience	Chemistry, Computational Studies, English, Food Science, Mathematics, Media Studies, Physics, Commerce and Management

Open Elective – II (Offered in Semester IV)				
Sl. No.	**Course Code**	**Course Title**	**Offering Department**	**Permitted Departments**
1	**A20BTO401**	Herbal Technology	Bioscience	Chemistry, Computational Studies, English, Food Science, Mathematics, Media Studies, Physics, Commerce and Management
2	**A20BTO402**	Vermiculture	Bioscience	Chemistry, Computational Studies, English, Food Science, Mathematics, Media Studies, Physics, Commerce and Management
3	**A20BTO403**	Biotechnology for Society	Bioscience	Chemistry, Computational Studies, English, Food Science, Mathematics, Media Studies, Physics, Commerce and Management

2.E.22.13

Annexure – III

மொழித்தாள்

தமிழ்-I

(B.A., B.Sc., B.Com., B.B.A., & B.C.A., பாடப்பிரிவுகளுக்குமான பொதுத்தாள்)

	L	T	P	C	Hrs
A20TAT101	3	0	0	3	45

பாடத்திட்டத்தின் நோக்கம்

இரண்டாயிரம் ஆண்டுகால தமிழின் தொன்மையையும் வரலாற்றையும் அதன் விழுமியங்களையும் பண்பாட்டையும் எடுத்துரைப்பதாக இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது. தமிழ் இலக்கியம் உள்ளடக்கத்திலும், வடிவத்திலும் பெற்ற மாற்றங்கள், அதன் சிந்தனைகள், அடையாளங்கள் ஆகியவற்றைக் காலந்தோறும் எழுதப்பட்ட இலக்கியங்களின் வழிய ராகக் கூறுவதற்கு இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது. மொழியின் கட்டமைப்பைப் புரிந்து கொள்வதாக இப்பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது. வாழ்வியல் சிந்தனைகள், ஒழுக்கவி யல் கோட்பாடுகள், சமத்துவம், சூழலியல் எனப் பல கூறுகளை மாணவர்களுக்கு எடுத்துரைக்கும் விதத்தில் இப்பாடத்திட்டம் உருவாக்கப்பட்டுள்ளது. சிந்தனை ஆற்றலை வருக் குவதற்குத் தாய்மொழியின் பங்களிப்பினை உணர்த்த இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.

பாடத்திட்டத்தின் வெளிப்பாடுகள்

CO1 -இலக்கியங்கள் காட்டும் வாழ்வியல் நெறிமுறைகளைப் பேணிநடத்தல்.

CO2 -நமது எண்ணத்தை வெளிப்படுத்தும் கருவியாகத் தாய்மொழியைப் பயன்படுத்துதல்.

CO3 -தகவல் தொடர்புக்குத் தாய்மொழியின் முக்கியத்துவத்தை உணர்ந்தல்.

CO4 -தாய்மொழியின் சிறப்பை அறிதல்.

CO5 -இலக்கிய இன்பங்களை நுகரும் திறன்களை வளர்த்தல்.

அலகு-1 **(9 Hrs)**

இக்காலக் கவிதைகள்-I

1. பாரதியார்	-	கண்ணன் என் சேவகன்
2. பாரதிதாசன்	-	தமிழ்ப்பேழு
3. அப்துல் ரகுமான்	-	அவதாரம்
4. மீரா	-	கனவுகள் + கற்பனைகள் = காகிதங்கள்
5. து.நரசிம்மன்	-	மன்னித்துவிடு மகனே

அலகு-2 **(9 Hrs)**

இக்காலக் கவிதைகள்-I

1.ராஜா சந்திரசேகர்	-	கைவிடப்பட்ட குழந்தை
2. அனார்	-	மேலும் சில இரத்தக் குறிப்புகள்
3. சுகிர்தராணி	-	அம்மா
4. நா.முத்துக்குமார்	-	தூர்

அலகு-3 **(9 Hrs)**

சிற்றிலக்கியங்கள்

1. கலிங்கத்துப் பரணி	–	பொருதக்கை வாள் எங்கே... (பாடல்–485)
2. அழகர்கிள்ளைவிடு தூது	–	இதமாய் மனிதருடனே...(பாடல்–45)
3. நந்திக் கலம்பகம்	–	அம்பொன்று வில்லொடிதல்...(பாடல்–77)
4. முக்கூடற் பள்ளு	–	பாடும் மருதஞ் செழிக்கவே...(பாடல்–47)
5. குற்றாலக் குறவஞ்சி	–	ஒடக் காண்பதுமே...(பாடல்–9)

2.E.22.14

கம்பியங்கள்

2. மணிமேகலை-உலகறவி புக்க காதை- 'மாசுஇல் வால்ஒளி! – இந்நாள் போலும் இளங்கொடி கெரித்தனை'.

(28-அடிகள்)

அலகு-4 **(9 கூடிநேரம்)**

தமிழ் இலக்கிய வரலாறு

1. சிற்றிலக்கியம்- தோற்றமும் வளர்ச்சியும்

2. புதுக்கவிதை- தோற்றமும் வளர்ச்சியும்

3. சிறுகதை –தோற்றமும் வளர்ச்சியும்

4. புதினம் -தோற்றமும் வளர்ச்சியும்

5. உரைநடை - தோற்றமும் வளர்ச்சியும்

உரைநடைப் பகுதி

1. உ.வே.சாமிநாதையர் – சிவதருமோத்தரச் சுவடி பற்ற வரலாறு.

2. தஞ்சாவூர்க் கவிராயர் – கூஜாவின் கோபம்.

3. இரா. பச்சியப்பன் – மாடல்ல மற்றையவை.

அலகு 5 **(9 கூடிநேரம்)**

மொழிப்பயிற்சி

1. கலைச்சொல்லாக்கம்

2. அகராதிசெய்முத்துதல்

3. பரத்தொடர்மொழி

4. கலை விமர்சனம்

5. நேர்காணல்

உரைநடை நூல்கள்

1. சக்திவேல், சு., தமிழ் மொழி வரலாறு, மணிக்கவாசகர் பதிப்பகம், சிதம்பரம், 1988.

2. சிற்பி பாலசுப்ரமணியம் மற்றும் நீலபத்மநாபன், புதிய தமிழ் இலக்கிய வரலாறு, தொகுதி-1, 2, 3, சாகித்திய அகாமி, *புதுடெல்லி,2013.*

3. பாரதியார், பாரதியார் கவிதைகள், குமரன் பதிப்பகம், சென்னை, 2011.

பார்வை நூல்கள்

1. கைலாசபதி, க., தமிழ் நாவல் இலக்கியம், குமரன் பதிப்பகம், வடபழனி, 1968.

2. சுந்தராஜன், டேகே. சிவபதசுந்தரம். சே., தமிழில் சிறுகதை வரலாறும் வளர்ச்சியும், க்ரியா, சென்னை, 1989.

3. பரந்தாமனார், அ.கி., நல்ல தமிழ் எழுத வேண்டுமா, பாரி நிலையம், சென்னை, 1998.

4. பாக்கியமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, என்.சி.எச். பதிப்பகம், சென்னை, 2011.

5. வல்லிக்கண்ணன், புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும், அன்னம், சிவகங்கை, 1992.

இணையத்தளங்கள்

1. http://www.tamilkodal.com
2. http://www.languagelab.com
3. http://www.tamilweb.com

2.E.22.15

	FRENCH – I	L	T	P	C	Hrs
A20FRT101	(Common to B.A., B.Sc., B.Com., B.B.A. & B.C.A)	3	0	0	3	45

OBJECTIVES

- To enable the students read, understand, and write simplesentences.
- To grasp relevant grammar forcommunication
- To learn about the land, people and culture ofFrance.

UNITÉ – 1 (9Hrs)

Je m'appelle Elise. Et Vous
?Vous Dansez ? D'accord
Monica, Yukiko et
compagnie

UNITÉ - 2 (9Hrs)

Les Voisins de Sophie
Tu vas au Luxembourg ?

UNITÉ – 3 (9Hrs)

Nous Venons pour
l'inscriptionA Vélo, en tain,
en avoin
Pardon, monsieru,le BHV s'il vous plait ?

UNITÉ - 4(9Hrs)

Au marche

On déjeune ici ?

UNITÉ - 5(9Hrs)

On va chez ma copine ?
Chez Susana

TextBook

PrescribedTextbook :* FESTIVAL 1 - *Méthode de Français
Authors : Sylvie POISSON-QUINTON
Michèle MAHEO-LE COADIC
Anne VERGNE-SIRIEYS
Edition : CLE International, Nouvelle Édition révisée : 2009.

Reference Book : Festival 1

2.E.22.16

A20GET101	GENERAL ENGLISH I (Common to B.A., B.Sc. and B.C.A.)	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To recognize the rhythms, metrics and other musical aspects of poetry.
- To read a variety of texts critically and proficiently.
- To enable the students to enjoy the flair of literature through the work of great writer.
- To make the students to know the functions of basic grammar and frame sentences withoutgrammatical error.
- To enable them understanding the intrinsic nuances of writing in English language.

Course Outcomes

After the completion of this course, the students will be able to

CO1 – Comprehend and discuss the various facets of selected poems.
CO2 – Analyze and interpret texts written in English.
CO3 – Read drama with graduate-level interpretive and analytical proficiency.
CO4 – Improve the fluency and formation of grammatically correct sentence.
CO5 – Enhance the writing skills for specific purposes.

UNIT I POETRY (9Hrs)

1. John Milton: On His Blindness
2. William Wordsworth: Daffodils
3. Percy Bysshe Shelly: Ozymandias
4. Emily Dickinson: Because I could not stop for Death
5. Sarojini Naidu: The Queen's Rival

UNIT II PROSE (9Hrs)

1. Francis Bacon: Of Love
2. Charles Lamb: A Dissertation upon Roast Pig

UNIT III DRAMA (9Hrs)

1. Oscar Wilde: Lady Windermere's Fan

UNIT IV GRAMMAR (9Hrs)

1. Parts of Speech
2. Tenses
3. Subject-Verb Agreement

UNIT V COMPOSITION (9Hrs)

1. Essay Writing
2. Email

2.E.22.17

Text Books:

1. James Barrett, "Brookside Musings: A Selection of Poems and Short Stories: Board ofEditors", Orient LongmanLimited, 2009.
2. Wilde Oscar, "Lady Windermere's Fan. Published in The Importance of Being Earnestand Other Plays" , London: Penguin, 1940.
3. Wren & Martin, "High School English Grammar & Composition". Blackie ELT Books, 2017.

Reference Books:

1. Lalitha Natarajan and Sasikala Natesan, "English for Excellence: Poetry", Anuradha Publications,2015.
2. Charles Lamb, "Selected Prose", Penguin Classics. United Kingdom, 2013.
3. Usha Mahadevan, "Sunbeams: Empower with English", Emerald Publishers, Chennai. 2016.

Web references:

1. https://www.englishcharity.com/of-love-by-francis-bacon-explanation/
2. https://www.poetry-archive.com/n/the_queens_rival.html
3. https://www.gradesaver.com/lady-windermeres-fan/study-guide/summary-act-i

2.E.22.18

		L	T	P	C	Hrs
A20BTT101	CELL BIOLOGY	4	0	0	4	60

(Common to B.Sc.Biotechnology, B.Sc. Microbiology and B.Sc. Biochemistry)

Course Objectives

- To understand the Fundamentals of Cells and its types.
- To study the cell structure and cellular organization.
- To understand the structure and Functions of cell organelles.
- To understand the Structure and organization of nucleus.
- To study about Cell division.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Understand the cells are the basic unit of life and various types of cells.
CO2 - Know the basic cell structure and basement membrane in cells.
CO3 - Understand the structure and functions of cellular organelles.
CO4 - Understand the structure and functions of nucleus.
CO5- Understand the basic mechanisms cell division.

UNIT – I **(10 hours)**

History of cell Biology, cell as basic unit of life, Cell theory, Protoplasm theory, Organismal theory, Classification & characterization of cell types — Prokaryotes & Eukaryotes, Organization, Ultrastructure of plant cell, animal cell, bacterial cell and viruses.

UNIT – II **(10 hours)**

Structure and function of cell wall - Bacterial and Plant. Ultrastructure of plasma membrane – fluid mosaic model, membrane fluidity, Transport across membranes - Symport, antiport, uniport, active and passive transport, Intra cellular communication, Differentiation of cell surface: Basement membrane, tight junction, gap junctions, Desmosomes, hemidesmosomes. Cytoskeletal structures – microtubules, microfilaments (actin, myosin), Intermediate filament.

UNIT –III **(10 hours)**

Structure & Functions of cell organelles: Endoplasmic Reticulum (SER & RER), golgi apparatus, lysosomes, microbodies (peroxysomes and glyoxysomes), ribosomes and its types, centrioles, basal bodies. Structure and functions of mitochondria, chloroplast, organization of respiratory chain in mitochondria, photophosphosphorylation in chloroplast.

UNIT – IV **(15 hours)**

Structure and organization of nucleus, nuclear membrane, organization of chromosomes - structural organization of chromatids, centromere, chromatin, telomere, nucleosomes, euchromatin and heterochromatin, specialized structures-polytene and lambrushchromosomes.

UNIT – V **(15 hours)**

Cell division - Cell cycle, mitosis and meiosis, regulations of cell cycle and check points and enzymes involved in cell cycle check points. Basics in cell signaling-signaling molecules and receptors, G protein coupled receptors, receptor protein tyrosin kinases, apoptosis and necrosis.

2. E. 22.19

Text Books:

1. E.D. P. De Robertis and E.M.F. De Robertis, Jr. 2012 Cell and Molecular Biology (Eighth edition). B.I. Waverly Pvt.Ltd. New Delhi.
2. Harvey Lodish, Arnold Berk, S. Lawrence Zipursky, Paul Matsudaira, David Baltimore and James Dernell, 2009. Molecular Cell Biology (Fourth Edition). Media Connected — W.H.Freeman and Company.
3. Verma. P.S and Agarwal. V.K. (2021), Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, 6 th Edition, S. Chand and Co. Ltd, New Delhi.

Reference Books:

1. Karp. G (2013), Cell and Molecular Biology- Concepts and Experiments, 7th Edition, John Wiley and Sons, Inc, New York.
2. D.E Sadava, 1993. Cell Biology - Organelle Structure and Function. Jones and BartlettPublishers
3. B Alberts, 2009 Essential Cell Biology (Third Edition), Garland Science; publishers
4. Alberts Bruce, 2008 Molecular Biology of the Cell (Fifth Edition), Garland Science;publishers

Web references:

1. https://www.google.com/search?q=History+of+cell+Biology
2. https://www.google.com/search?q=structure+and+function+of+cell+wall+ppt&sxsrf
3. https://www.toppr.com/guides/biology/the-fundamental-unit-of-life/cell-organelle/
4. https://www.microscopemaster.com/nucleus.html
5. https://www.tutorialspoint.com/cell_cycle_and_cell_division/index.asp

2.E.22.20

	L	T	P	C	Hrs
A20BTT102					
BIOCHEMISTRY- I BIOMOLECULES					
	4	**0**	**0**	**4**	**60**

(Common to B.Sc. Biotechnology, B.Sc. Microbiology and B.Sc. Biochemistry)

Course Objectives

- To understand the fundamentals of carbohydrate.
- To study about the classification, structure and properties of amino acids
- To understand the classification, Structures and Biological importance of enzyme.
- To understand the classification, Structures and Biological importance of lipid.
- To study about composition, structure and biological importance of genetic material.

Course Outcomes

After completion of the course, the students will be able to

CO1 – Develop the fundamental idea about carbohydrate.

CO2 – Understand about the role and properties of amino acids.

CO3 – Understand about enzymes and its role in biological system.

CO4 – Understand the role of lipid and its structure.

CO5 - Understand about composition, structure and biological importance of genetic material.

UNIT-I **(10 hours)**

Carbohydrates: Classification of carbohydrates, Occurrence and structure of mono, di and polysaccharides (homo and heteropolysaccharides), asymmetry, stereo-isomerism and optical isomerism of sugars, anomeric form and mutarotation. Biological importance of carbohydrates (starch, cellulose, chitin)

UNIT-II **(15 hours)**

Amino acids & Proteins: Classification, structure and Properties of amino acids, Essential and non-essential amino acids, peptide bond and chemical bonds involved inprotein structure

- Protein classification based on solubility, shape, composition and function, Structure of proteins (Primary, secondary tertiary and quaternary), Biologically important peptides (insulin, glutathione, vasopressin).

UNIT-II **(15 hours)**

Enzymes: Definition, Classification & nomenclature of enzymes - Specificity of enzyme action - Fischer's Lock and Key Hypothesis & Koshland's Induced Fit Hypothesis - Active site — coenzyme - Enzyme kinetics, Michaelis-Menten equation and Lineweaver-burk plot) - significance of K_m and V_{max} — enzyme inhibitors (reversible, irreversible and feedback inhibitions), Modes of enzyme inhibition, Regulatory enzymes (Allosteric & covalently modulated enzymes). Biological importance of enzymes (ribonuclease and chymotrypsin)

UNIT-IV **(10 hours)**

Lipids: Classification, nomenclatures, structure and functions of Simple, Compound and Derived lipids, Structure and functions of fatty acids (Essential Fatty Acids), Tri-acyl glycerol, phospholipids, sphingolipids, Glycolipids and Gangliosides. Biological importance of lipids (PUFA)

UNIT-V **(10 hours)**

Nucleic acid: Structure, Properties and types of nucleic acid, Composition of DNA and RNA - Watson and Crick model of DNA, Structure of purines and pyrimidines, Structure of Nucleosides and Nucleotides. Structural forms of DNA, Biological importance of Nucleic acids

9.E.22.21

Text Books:

1. Nelson, D.L. and Cox, M.M. (2021). Lehninger Principles of Biochemistry, Eight Edition, W.H. Freeman and Company, New York.
2. Voet, D., Voet, J.G. and Pratt, C.W. (2013).Fundamentals of Biochemistry – Life at the Molecular level, Fouth Edition, John Wiley & Sons. Inc, New York.
3. Roy Tasker, Carl Rhodes. Stryer's Biochemistry (7th Edition) W. H. Freeman publishers(2012).
4. Sathyanarayana . N – Biochemistry, 5th Edition, 2019.

Reference Books:

1. Zubey G. Principles of Biochemistry, Oscar Publication (2000).
2. Devlin T. M. Text Book of Biochemistry with Clinical Correlations (4th Edition) Wiley &Sons Publication (2005).

Web references:

1. https://www.toppr.com/guides/chemistry/biomolecule/carbohydrates/
2. https://www.tutorialspoint.com.cach3.com/class_11th_proteins/protein_amino_acids.asp.ht ml
3. https://byjus.com/biology/enzymes/
4. https://sciencemusicvideos.com/ap-biology/module-6-menu-biochemistry/biochemistry-3- lipids-interactive-tutorial/
5. https://www.britannica.com/science/nucleic-acid/Deoxyribonucleic-acid-DNA

2.E. 22-22

		L	T	P	C	Hrs
A20MBD101	BASIC MICROBIOLOGY	4	0	0	4	60

Course objective

- To understand the basics of microbiology and Classification.
- To understand the students to understand about the Ultrastructure structure and function of microorganisms.
- To understand the Principles and types of staining and principles and types of microscopes
- To understand the Classification of microorganisms based on their nutritional types.
- To understand the methods of microbial control.

Course Outcomes

After the completion of this course, the students will be able to

CO1 – Define the basics of microbiology and Classification of Microbiology
CO2 – Describe the Ultrastructure structure and function of microorganisms.
CO3 – Describe the Principles and types of staining and principles and types of microscopes.
CO4 – Recognize and compare Classification of microorganisms based on their nutritional types.
CO5 – Demonstrate aseptic microbiological techniques in the laboratory and check sources of microbial contamination and their control.

UNIT - I (10 hours)

Basics of microbiology, History and Scope of microbiology, General features and Classification of Archaea, Bacteria, Fungi, Algae, Protozoa, Viruses and Prions. Differences between prokaryotic and eukaryotic organisms.

UNIT- II (15 hours)

Cell wall of bacteria, Cell membrane, Cell envelope - capsule and slime layer, Cellular appendages - pili, flagella and fimbriae, inclusion bodies, Plasmid DNA and chromosomal DNA. Bacterial genetics - conjugation, transduction (generalized and specialized), and transformation.

UNIT - III (15 hours)

Principles and types of staining (simple and differential), Microscopy –Instrumentation, principles and applications of light microscopes (bright field, dark field, phasecontrast, fluorescent microscopes) and electron microscopes (transmission and scanning electron microscopes)

UNIT - IV (10 hours)

Classification of microorganisms based on their nutritional types, culturing of microbes - Preparation of media, types of media, Aerobic and Anaerobic culturing of bacteria, Microbial growth curve, Isolation, preservation and maintenance of microorganisms,Effect of biotic and abiotic factors on the growth of organisms.

UNIT – V (10 hours)

Sterilization – Classification of Sterilization, Physical methods : Temperature (moist heat, dry heat) desiccation, osmotic pressure, radiation, UV-light, electricity, ultrasonic sound waves, filtration. Chemical methods: (halogens, alcohol, gaseous sterilization), Antiseptics and disinfectants.

2. E. 22. 23

Text Books:

1. M.J. Pelczar Jr. E.C.S. Chan and N.R. Kreig, Microbiology (5th edition), Tata MaCraw-Hill, New Delhi;
2. R. Ananthanarayanan. and C.K.Jayaram Panickar, Text book of Microbiology (9th edition), Orient LongmanPublications, New Delhi
3. Lansing M. Prescott, John. P. Harley, Donald A. Klein, 1999. Microbiology (9th edition) WCB MaCraw-Hill,
4. NewYork;
5. Chakraborty, P, (2013), A textbook of microbiology, 3rd edition, New Central Book Agency (p) Ltd Publications.

Reference books:

1. Sundararajan S (2003). College Microbiology, revised edition, Vardhana publications, Banglore.
2. R.C. Dubey, D.K.Maheswari, A Text book of Microbiology (2005), S.Chand & Company Ltd. New Delhi
3. Talaro, K.P and Talaro.A, (2017) Foundations in Microbiology, 10th edition, McGraw Hill Publishers, NewYork.

Web references:

1. https://www.tutorialspoint.com/biological_classification/index.asp
2. https://www.encyclopedia.com/science/encyclopedias-almanacs-transcripts-and-maps/bacterial- ultrastructure
3. http://www.auburn.edu/academic/classes/biol/4101/estridge2/tutorial1a.pdf
4. https://www.scientistcindy.com/microbial-nutrition-and-growth.html
5. http://www.lamission.edu/lifesciences/lecturenote/mic20/Chap07Control.pdf

2.8.22.24

A20AET101	ENVIRONMENTAL STUDIES	L	T	P	C	Hrs
	(Common for all B.A., B.Sc.,B.Com., B.B.A, B.C. A.)	2	0	0	2	20

Course Objectives

- To gain knowledge on the importance of natural resources and energy.
- To know the structure and function of an ecosystem
- To imbibe an aesthetic value with respect to biodiversity, understand the threats and itsconservation and appreciate the concept of interdependence
- To know the causes of types of pollution and disaster management
- To observe and discover the surrounding environment through field work.

Course Outcomes

After completion of the course, the students will be able to

CO1 – Understand about the various resources
CO2 – Learn about the biodiversity
CO3 – Learn the different types of pollution and to prevent the pollution
CO4 – Know about the pollution Act
CO5 – Observe various environmental issues in surroundings

UNIT I INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES (6 Hrs)

Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources -Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land usepattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT II ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION (6 Hrs)

Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain -Food web -Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem. Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation ofbiodiversity –Insitu&Exsitu.

UNIT III ENVIRONMENTAL POLLUTION AND MANAGEMENT (6 Hrs)

Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earth quake, Cyclone and Landslides. Role of individuals inprevention of pollution - pollution case studies.

UNIT IV SOCIAL ISSUES - HUMAN POPULATION (6 Hrs)

Urban issues - Energy - water conservation - Environmental Ethics - Global warming - Resettlement and Rehabilitation issues - Environmental legislations - Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Womenand child welfare - Public awareness - Case studies.

UNIT V FIELD WORK (6 Hrs)

Visit to a local area / local polluted site / local simple ecosystem - Report submission

2.E.22.25

Text Books:

1. Bharucha Erach, "Textbook of Environmental Studies for Undergraduate Courses",Telangana, India:Orient Black Swan, 2rd Edition, 2013,
2. BasuMahua, Savarimuthu Xavier, "SJ Fundamentals of Environmental Studies". Cambridge,United Kingdom: Cambridge University Press , 2017.
3. Agarwal, K.C "Environmental Biology", Nidi Publ. Ltd. Bikaner, 2001 .

Reference Books:

1. Kumarasam.K., A. Alagappa Moses AND M.Vasanthy, "Environmental studies", Bharathidasanuniversity pub, 1, trichy2004.
2. Rajamannar, "Environmental studies", EVR College PUB, Trichy2004
3. Kalavathy, S. (ED.) ,"Environmental Studies", Bishop Heber College PUB., Trichy 2004.

Web references:

1. https://www.youtube.com/watch?v=78prsPYm98g
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2792934/
3. https://www.frontiersin.org/articles/505570

2.E.22.26

25

A20BTL103	CELL BIOLOGY PRACTICALS	L	T	P	C	Hrs
		0	0	2	1	20

(Common to B.Sc. Biotechnology, B.Sc. Microbiology and B.Sc. Biochemistry)

Course Objectives

- To gain the practical skills about cell Biology by experimenting microscope, micrometer, mitosis, meiosis, cell counting and dicot leaf section.

Course Outcomes

After completion of the course, the students will be able to

- Carryout cell Biology practical like microscope, micrometer, mitosis, meiosis, cell counting anddicot leaf section.

1. Microscopy
2. Micrometer
3. Permanent slide preparation
4. Mitosis in onion root tip cells
5. Meiosis in grasshopper testis
6. Cell counting and viability
7. Mitochondrial isolation
8. Blood smear preparation
9. Preparation of microscopic slide for dicot leaf section

Text Books:

1. Laboratory Manual of Cell Biology (Rina Majumdar, Rama Sisodia)
2. Student Solutions Manual for Molecular Cell Biology: Solutions Manual (Lodish Harvey),Publisher: Macmillan Learning
3. Laboratory manual on cell biology and microbiology (Dr. N. Banu, Ms. Pavithra. S), Publisher: Sara Book Publication

Reference Books:

1. Practical laboratory manual- CELL BIOLOGY (Gupta Amit), Publisher: LAP Lambert Academic Publishing.

Web references:

1.https://vulms.vu.edu.pk/Courses/BIO201/Downloads/paractical%20manual%20of%20cell%20bio%20201%202 5-4-17.pdf

2. http://www.ihcworld.com/_protocols/lab_protocols/cell-biology-lab-manual-heidcamp.htm 26

2.E.22.27

A20BTL103	BIOMOLECULES PRACTICALS	L	T	P	C	Hrs
		0	0	2	1	20

(Common to B.Sc. Biotechnology, B.Sc. Microbiology and B.Sc. Biochemistry)

Course Objectives

- To gain the practical skills about Analysis of various Biomolecules such as Protein, Amino acid, Carbohydrate etc.

Course Outcomes

After completion of the course, the students will be able to

- Perform the Analysis of various Biomolecules Such as Protein, Amino acid, Carbohydrate etc.

1. Qualitative Analysis of Proteins
2. Qualitative Analysis of Aromatic amino and Sulphur containing amino acids
3. Qualitative Analysis of Carbohydrates
4. Qualitative Analysis of Fats
5. Extraction of Starch from Potatoes
6. Extraction of Ovalbumin from Egg
7. Extraction of Lactalbumin from Milk
8. Extraction of RNA
9. Extraction of DNA

Text Books:

1. Manual of Practical Biochemistry (Mohammed Rafi), Publisher: Orient Blackswan Pvt Ltd
2. Biochemistry practical manual (Rajendiran Soundravally), Publisher: Elsevier
3. Practical Biochemistry (K Geetha Damodaran), Publisher: Jaypee Brothers Medical

Reference Books:

1. Practical Manual of Biochemistry (Kaushik G.G.) Publisher: CBS Publishers & Distributors

Web references:

1.https://bio.libretexts.org/Bookshelves/Biotechnology/Lab_Manual%3A_Introduction_to_Biotechnology/01%3A_ Techniques/1.09%3A_Biomolecule_Detection

2. https://www.researchgate.net/publication/301647645_PRACTICAL_BIOCHEMISTRY

2.E.22.28

	BASIC MICROBIOLOGY PRACTICALS	L	T	P	C	Hrs
A20MBL102		0	0	2	1	30

Course objective

- To learn the sterilization techniques, culture media preparation, culture method, stainingtechniques and the characterization experiments.

Course Outcomes

After the completion of this course, the students will be able to

- Perform the sterilization techniques, culture media preparation, culture method, stainingtechniques and microbial characterization experiments.

1. Sterilization Techniques & sterilization of Media, Glass wares
2. Media Preparation (solid & liquid)
3. Types of culture method Streak plate, Pour plate & Spread plate
4. Isolation & Enumeration of Microorganism from water and Soil
5. Staining Techniques–Simple, Gram's & Spore Staining
6. Motility of bacteria by Hanging drop technique
7. Characterization of microorganisms -IMVIC tests
8. Measurement of Growth rate of bacteria - Turbidometric method
9. Antibiotic sensitivity Test - Kirby Bauer method.

Text Books:

1. Microbiology Practical Manual, 1st Edition (Jain Amita) Elsevier India
2. Practical and applied microbiology (Anuradha De) 5th edition,
3. Mackie & Mccartney Practical Medical Microbiology, Publisher: Elsevier India 14th edition
4. Practical Manual for Undergraduates Microbiology (Mukesh Kumar) Publisher: Jain Brothers

Reference Books:

1. Practical Handbook of Microbiology (Emanual goldman,lorrence H Green) Publisher: Taylor & Francis Inc.

Web references:

1. https://www.cdc.gov/infectioncontrol/guidelines/disinfection/sterilization/index.html
2. https://microbiologysociety.org/publication/education-outreach-resources/basic-practical-microbiology-a- manual.html

2. E. 22. 29

A20MBS101	COMMUNICATION SKILLS LAB	L	T	P	C	Hrs
	(Common to B.A., B.Sc., B.Com., B.B.A.& B.C.A.)	0	0	4	2	30

Course Objectives

- To improve the students 'speed in reading.
- To decode the correspondence between sound and spelling in English.
- To train students to organize, revise and edit ideas to write clearly and effectively.
- To enhance the sense of social responsibility and accountability of the students.
- To expound the significance of time and stress management.

Course Outcomes

After the completion of the course, the students will be able to

CO1– Understand the pattern to communicate effectively.
CO2– Impart Speaking skills with confidence.
CO3– Use writing strategies to improve the drafting skills and comprehending of articles.
CO4–Demonstrate leadership qualities to Participate in Group Discussion and Interview efficiently.
CO5–Expertise in Managerial skills.

UNIT I COMMUNICATIONSKILLSSPEAKING (6Hrs)

Aspects of speaking - Process and techniques of effective speech – Presentations - topic to be given tostudents for short speech.

UNIT II SELF-MANAGEMENTSKILLS (6Hrs)

Time Management - Stress management – Perseverance – Resilience - Mindmapping–Self-confidence

UNIT III COMMUNICATIONSKILL-READING (6Hrs)

Phonics– Self-Introduction –Vocabulary–Comprehension-skimming and scanning.

UNIT IV SOCIALSKILLS (6Hrs)

Negotiation and Persuasion –Leadership–Teamwork–Problem solving –Empathy–Decision making.

UNIT V COMMUNICATIONSKILL-WRITING (6Hrs)

Descriptive –Narrative–Persuasive–Expository–Picture composition

2.E.22.30

Text Books

1. Syamala,V,"EffectiveEnglishCommunicationforyou",Chennai:EmeraldPublishers,2002
2. Balasubramanian, T," A Textbook of English Phonetics for Indian Students",New Delhi:Trinity Press 1981
3. Sardana,C.K.,"The Challenge of Public Relations",New Delhi: Har-AnandPublications,1995.

Reference Books

1. Morley, David and Philip Neilson, editors", The Cambridge Companion to CreativeWriting",Cambridge:2012.
2. Eastwood,John,"Oxford Grammar",Oxford UniversityPress,1999.
3. Prasad,HariMohan,"AHandbookofSpottingErrors:"McGrawHillEducation, 2010.
4. Murphy,JohnJ,"PullingTogether:10RulesforHigh-PerformanceTeamwork", SimpleTruths,2016.

Web references

1. www.softwaretestinghelp.com›how-to-crack-the-gd
2. www.businessballs.com›communication-skills›prese...
3. www.teachingenglish.org.uk›article›public-speaking...
4. www.teachingenglish.org.uk›article›public-speaking...
5. www.monster.com›career-advice›article›boost-you...

2. E. 22.31

A20TAT202 **மொழித்தாள்**

தமிழ்– II

(B.A., B.Sc., B.Com., B.B.A., & B.C.A., பாடப்பிரிவுகளுக்குமான மொழித்தாள்)

L	T	P	C.	Hrs
3	0	0	3	45

பாடத்திட்டத்தின் நோக்கம்

இரண்டாயிரம் ஆண்டுகால தமிழின் தொன்மையையும் வரலாற்றையும் அதன் விழுமியங்களையும் பண்பாட்டையும் எடுத்துரைப்பதாக இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது. தமிழ் இலக்கியம் உள்ளடக்கத்திலும், வடிவத்திலும் பெற்ற மாற்றங்கள், அதன் சிந்தனைகள்,அடையாளங்கள் ஆகியவற்றைக் காலந்தோறும் எழுதப்பட்ட இலக்கியங்களின் வழியாகக் கூறுவதற்கு இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது. மொழியின் கட்டமைப்பை புரிந்து கொள்வதாகவும் பாடத்திட்டம் வடிவமைக்கப்பட்டுள்ளது. வாழ்வியல் சிந்தனைகள், ஒழுக்கவியல் கோட்பாடுகள், சமத்துவம், சூழலியல் எனப் பல கூறுகளை மாணவர்களுக்கு எடுத்துரைக்கும் விதத்தில் இப்பாடத்திட்டம் உருவாக்கப்பட்டுள்ளது. சிந்தனை ஆற்றலை பெருக்குவதற்குத் தாய்மொழியின் பங்களிப்பினை உணர்த்த இப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.

பாடத்திட்டத்தின் வெளிப்பாடுகள்

CO1 - இலக்கியங்கள் காட்டும் வாழ்வியல் நெறிமுறைகளைப் பேணிநடத்தல்.

CO2 - நமது எண்ணத்தை வெளிப்படுத்தும் கருவியாகத் தாய்மொழியைப் பயன்படுத்துதல்.

CO3 - தகவல் தொடர்புக்குத் தாய்மொழியின் முக்கியத்துவத்தை உணர்தல்.

CO4 - தாய்மொழியின் சிறப்பை அறிதல்.

CO5 - இலக்கிய இன்பங்களை நுகரும் திறன்களை வளர்த்தல்.

அலகு-1 **(9 Hrs)**

எட்டுத்தொகை:

1. குறுந்தொகை (மடல்-130).
2. நற்றிணை (பாடல்-27).
3. அகநானூறு (பாடல்-86)
4. ஐங்குறுநூறு (பாடல்-203)
5. கலித்தொகை– பாலைத்திணை (பாடல்-9)
6. புறநானூறு (பாடல்-235)

பத்துப்பாட்டு:

1.சிறுபாணாற்றுப்படை (அடிகள்-126-143)

2. முல்லைப்பாட்டு (6-21)

அலகு-2 **(9 Hrs)**

பதினென் கீழ்க்கணக்கு:

1. *திருக்குறள்– வெகுளாமை (அதிகாரம்-31), காதல் சிறப்புரைத்தல் (அதிகாரம்-113)*
2. நாலடியார் - நல்லார் எனத்தான் (221)
3. *திரிகடுகம்– கோலஞ்சி வாழும் குடியும் (33)*
4. இனியவை நாற்பது- குழவி தளர்நடை (14)
5. *கார் நாற்பது- நலமிகு கார்த்திகை (26)*
6. களவழி நாற்பது-கவளங்கொள் யானை (14)

அலகு-3

வைணவம் – நாலாயிரத் திவ்வியப் பிரபந்தம்

1. பேயாழ்வார்	–	திருக்கண்டேன் பொன்மேனி....
2. பெரியாழ்வார்	–	கருங்கண் தோகை மயிற் பீலி....
3. தொண்டரடிப்பொடியாழ்வார்	–	பச்சைமாமலை போல்....

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2.E.22.32

4. ஆண்டாள் – கருப்பூரம் நாறுமோ? கமலப்பூ....
5. திருமங்கையாழ்வார் – வாழனேன் வாடி வருந்தினேன்....

இன்னிசையம்

சிறப்புணைம்– பாடல் நின்ற பிணை மானுக்குப்...5 பாடல்கள் (பாடல் எண்கள் 61-65)

கிருத்துவம்

இரட்சண்ய யாத்திகம்– கடைதிறப்பு படலம் –5 பாடல்கள் (பாடல் எண்கள்: 3,9,10,15,16)

அலகு – 4 **(9 Hrs)**

தமிழ் இலக்கிய வரலாறு

1. சங்க இலக்கியங்கள்

2. நீதி இலக்கியங்கள்

3. பக்தி இலக்கியங்கள்

4. காப்பியங்கள்

அலகு-5 **(9 Hrs)**

சிறுகதைகள்

1. புதுமைபித்தன்	–	*அகலிகை*
2. நா. பிச்சமூர்த்தி	–	வேப்பமரம்
3. அகிலன்	–	*ஒரு வேளைச்சோறு*
4. ஜி.நாகராஜன்	–	பச்சக் குதிரை
5. கி.ராஜநாராயணன்	–	*கதவு*
6. சா.கந்தசாமி	–	தக்கையின் மீது நான்கு கண்கள்

பார்வை நூல்கள் :

1. அரசு, வீ., இருபதாம் நூற்றாண்டு சிறுகதைகள் நூறு, அடையாளம் பதிப்பகம், திருச்சி, 2013.

2. அருணாச்சலம், பா., பக்தி இலக்கியங்கள், பாரி நிலையம், சென்னை, 2010.

3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை, 2000.

4. மாக்கியமேரி, வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு, என்.சி.பி.எச். பதிப்பகம், சென்னை, 2011.

5. பகவதி, மா. வே., செம்மொழித் தமிழ் இலக்கண இலக்கியங்கள், தமிழ்ப் பல்கலைக்கழகம், 2010 .

உசாநடை நூல்கள் :

1. அன்பு, பா., மா.வொ.சி யின் ஒரு இலக்கிய நூல்கள் ஒரு மதிப்பீடு, உலக தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை,1983.

2. பிள்ளை, கே.கே., தமிழக வரலாறும் மக்களும் பண்பாடும், உலக தமிழ் ஆராய்ச்சி நிறுவனம், சென்னை, 2000.

3. ஜெயமோகன், நவீன இலக்கிய அறிமுகம், உயிர்மைப் பதிப்பகம், சென்னை, 1995.

இணையத்தளங்கள் :

1. http://www.tamilkodal.com
2. http://www.languagelab.com
3. http://www.tamilweb.com

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	FRENCH – II	L	T	P	C	Hrs
A20FRT202	(Common to B.A., B.Sc., B.Com., B.B.A. & B.C.A)	3	0	0	3	45

OBJECTIVES

- To enable the students read, understand, and write simple sentences.
- To grasp relevant grammar for communication .
- To learn about the land, people and culture of France.

UNITÉ - 1(9 Hrs)

Qu'est -ce qu'on leur offre
?On solde !
Découvrir Paris en bus avec l'open Tour

UNITÉ - 2(9 Hrs)

Si vous gagne vous ferez quoi

Parasol ou parapluie ?

UNITÉ - 3(9 Hrs)

Quand il est midi á
ParisVous allez Vivre
L'avenir du Français

UNITÉ - 4(9 Hrs)

Souvenirs d'enfance

j'ai fait mes études á Lyon 2

UNITÉ – 5(9 Hrs)

Retour des Antilles

Au voleur ! Au voleur

Text Books

Prescribed Text book : **FESTIVAL 1** ***- Méthode de FrançaisAuthors : Sylvie POISSON-QUINTON***

Michèle MAHEO-LE COADICAnne VERGNE-SIRIEYS, Edition : CLE International, Nouvelle Édition révisée : 2009.

Reference Book

Festival 1

2.E.22.34

		L	T	P	C	Hrs
A20GET202	**GENERAL ENGLISH- II** (Common to B.A, B.Sc. and BCA)	3	0	0	3	45

Course Objectives

- ***To recognize poetry from a variety of cultures, languages and historic periods***
- To develop the intensive study of language by critical reading
- To identify the various genres and analyze the works of writers in English
- To expand the basic understanding of targeted grammatical structures
- To understand the conventions of writing in English

Course Outcomes

After the completion of this course, the students will be able to

CO1–Understand and appreciate poetry as a literary art form.
CO2–Comprehend and recognize relationship between ideas, events and facts.
CO3–Learn to explore characters and their conflicts,dilemmas and extend their response to stories.
CO4–Apply grammatical structures meaningfully and appropriately in or land written form.
CO5– Write effectively and coherently.

UNIT I POETRY

1. Lord Byron: She Walks in Beauty
2. Robert Frost: Stopping by Woods on a Snowy Evening
3. Nissim Ezekiel:Night of the Scorpion
4. RabindranathTagore: Where the Mind is Without Fear

UNIT II PROSE

Ernest Hemingway-A Day's Wait
1. Anton Chekhov: The Lottery Ticket

UNIT III FICTION

Jane Austen- Prideand Prejudice

UNIT IV GRAMMAR

1.Voice–Conditionals –Coherence

UNIT V COMPOSITION

1. Letter Writing
2. Report Writing

2. E. 22. 35

Text Books

1. WisdomandExperience:AnAnthologyforDegreeClasses.BoardofEditors",OrientLongmanLimited,2007
2. "The Approach to Life: A Selection of EnglishProse",OrientLongmanLimited,2009.
3. "Brookside Musings: A Selection of Poems and Short Stories: Board of Editors", Orient, LongmanLimited,2009.

Reference Books

1. LalithaNatarajanandSasikalaNatesan,"EnglishforExcellence:Poetry",AnuradhaPublicationsLiteraryPursuits: BoardofEditors,OrientLongmanLimited,2015.
2. S.C.Gupta,"EnglishGrammar&Composition",Arihant,2014
3. Rabindranath Tagore, Where the mind is without fear",London :TheIndiaSociety,1912.
4. RaymondMurphyandSuraiPongtongcharoen,"EnglishGrammarinUse",CambridgeUniversity,1985.

Web references

1. https://poets.org/poem/she-walks-beauty
2. https://www.poetryfoundation.org/poems/46467/the-flea
3. https:// www.classicshortsstories/lottery.html
4. http://short-storylovers.blogspot.com/2012/07/thief-by-ruskin-bond.html
5. http://www.gutenberg.org/files/1342/1342-h/1342-h.htm

2.E.22.36

		L	T	P	C	Hrs
A20MBT201	**MICROBIAL DIVERSITY**	**4**	**0**	**0**	**4**	**60**

Course objective

- To understand the basics of the taxonomical classification of Microorganisms
- To ensures the students to understand about the General characteristics of different groups.
- To make aware of the taxonomy, characters, life cycle and economic importance of Fungi
- To elucidate the morphology, characters, reproduction and economic importance of Algae.
- To summarize the basic morphology of Protozoa and its classification.

Course Outcome

After the completion of this course, the students will be able to

CO1 – Define the basics of microbial classification, taxonomy and their modern approaches.
CO2 – Gain knowledge about major divisions and General characteristics of different groups.
CO3 – Explore the taxonomy, characters, life cycle and economic importance of Algaei with representative types.
CO4 – Know about the morphology, characters, reproduction and economic importance of Fungi.
CO5 – Understand the basic structural characterization of Protozoa and its classification.

UNIT – I **(10 hours)**

Taxonomy — Whittaker's five-kingdom concept – Modern approaches - Numerical, Molecular Sero taxonomy and Chemotaxonomy - Characters in microbial taxonomy (morphological, physiological, ecological, genetics protein content, nucleic acid sequence and base composition)-Importance of microbial diversity.

UNIT- II **(10 hours)**

General characteristics of different groups: Acellular microorganisms (Viruses, Viroids, Prions) and Cellular microorganisms (Bacteria, Algae, Fungi and Protozoa) with emphasis on distribution and occurrence, morphology, mode of reproduction and economic importance.

UNIT – III **(15hours)**

Algae : History of phycology with emphasis on contributions of Indian scientists; General characteristics of algae including occurrence, thallus organization, algae cell ultra-structure, pigments, flagella, eyespot food reserves and vegetative, asexual and sexual reproduction. Different types of life cycles in algae with suitable examples:Haplobiontic, Haplontic, Diplontic, Diplobiontic and Diplohaplontic life cycles. Applications of algae in agriculture, industry, environment and food.

UNIT – IV **(15 hours)**

Fungi: Historical developments in the field of Mycology including significant contributions of eminent mycologists. General characteristics of fungi including habitat, distribution, nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation, fungal wall structure and synthesis, asexual reproduction, sexual reproduction, heterokaryosis, heterothallism and parasexual mechanism. Economic importance of fungi with examples in agriculture, environment, Industry, medicine, food, biodeterioration and mycotoxins.

UNIT – V **(10 hours)**

Protozoa: General characteristics with special reference to Amoeba, Paramecium, Plasmodium, Leishmania and Giardia, Drug Development against protozoa Infection - the economic importance.

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Text Books

1. Joanne Willey and Kathleen Sandman and Dorothy Wood, (2020). Prescott"s Microbiology 11thEd. Mc Graw Hill Book.

2. Michael J. Pelczar, Jr. E.C.S. Chan, Noel R.Krieg, (1993). Microbiology 5thEd. Mc Graw Hill Book Company.

3. Brown J.W. (2015) Principles of Microbial Diversity, ASM Press.

References

1. Madigan, Michael T., Martinko, John M., Dunlap, Paul V., Clark, David P, (2015). Brock „s Biology of Microorganisms Global Ed. Pearson Publications.

2. Whitman, W.B., Goodfellow, M., Kämpfer, P., Busse, H.-J., Trujillo, M.E., Ludwig and Suzuki, K, (2012). Bergey"s Manual of Systematic Bacteriology, 2ndEd., Vol. 5. Parts A and B, Springer- Verlag, New York, NY.

3. Madigan M.T., Bender K.S., Buckley D.H., Sattley W.M. and Stahl D.A. (2017) Brock Biology of Microorganisms,15thEdn. (Global Edn.) Pearson Education.

4. Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International.

5. Atlas RM. (1997). Principles of Microbiology. 2nd edition.

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1. http://www.science direct.com
2. https://www.intechopen.com
3. http://www.onlinelibrary.wiley.com
4. https://openaccessebooks.com/current-research-in-microbiology.html
5. https://microbiologyinfo.com/top-and-best-microbiology-books/

2.E.22.38

		L	T	P	C	Hrs
A20MBT202	ANALYTICAL TECHNIQUES IN MICROBIOLOGY	4	0	0	4	60

Course Objectives

- To understand the Principle of microscopy.
- To study the Principle and types of law of spectrophotometry.
- To understand the principle and types of chromatography.
- To understand the principle of electrophoresis .
- To study about Centrifugation.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Understand the Principle of microscopy .
CO2 - Know the the Principle and types of law of spectrophotometry
CO3 - Understand the principle and types of chromatography .
CO4 - Understand the principle of electrophoresis and its applications.
CO5- Understand the Centrifugation.

UNIT I **(10 Periods)**

Simple microscopy, phase contrast microscopy, florescence and electron microscopy (TEM and SEM)

UNIT II **(15 Periods)**

Beer-Lamberts law, pH meter, absorption and emission spectroscopy, Principle and law of absorption fluorimetry, colorimetry, spectrophotometry (visible, UV, infrared)

UNIT III **(15 Periods)**

Centrifugation – Principle & types, sedimentation co-efficient, sedimentation velocity, ultra centrifugation, separation of macromolecules, subcellular fractionation. Introduction to Biosensors and Nanotechnology and their applications.

UNIT IV **(15 Periods)**

Introduction to the principle of chromatography. Paper chromatography, thin layer chromatography, column chromatography: silica and gel filtration, affinity chromatography, ion exchange chromatography, gas chromatography and HPLC.

UNIT V **(15 Periods)**

Introduction to electrophoresis. Starch-gel, polyacrylamide gel (native and SDS-PAGE), agarose-gel electrophoresis, pulse field gel electrophoresis, immuno- electrophoresis, Western blotting, isoelectric focusing.

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Text Books:

1. Upadhyay., Biophysical Chemistry-, Himalaya Publication, Edition III
2. Ghatak, K.L., 2003. Techniques and Methods In Biology. PHI Learning Private Ltd. New Delhi
3. Zubay.G.L,, 1993. Biochemistry, 4thEdi. WmC. Brown Publishers.

Reference Books:

1. Joseph Sambrook and David. W. Russel, Molecular Cloning- A laboratory manual, 4th edition, 2012, Cold spring harbor press.
2. Physical Biochemistry, Applications to Biochemistry and Molecular Biology - D, Freifelder.
3. H.V. Volkones., General Biophysics, Vol I&II
4. Wilson, K. and Walker, J. Practical Biochemistry – Principles and techniques 7th editio 2010,Cambridge University Press,
5. Brawer, I M., Perce, A.M., Experimental techniques in Biochemistry. Prentice Hall Foundation, New York 2012.
6. S.Mahesh., 2003 Biophysics NewAge International Private Ltd.

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1. https://microbiologynotes.org/microscopy-overview-principles-and-its-types/
2. https://microbenotes.com/uv-spectroscopy-principle-instrumentation-applications/
3. https://microbenotes.com/chromatography-principle-types-and-applications/
4. https://microbiologynotes.org/electrophoresis-overview-principles-and-types/
5. https://microbenotes.com/centrifuge-and-centrifugation/

2.E.22.40

A20MBD203	MICROBIAL PHYSIOLOGY	L	T	P	C	Hrs
		4	0	0	4	60

Course Objectives

- To learn about Requirement of Nutrients for microbes.
- To lear about different types of cutyure medium in microbiology laboratory.
- To impart knowledge on Microbial Growth.
- To facilitate the students to understand about Microbial Photosynthesis
- To understand the Microbial Metabolism.

Course Outcomes

After completion of this course, the students will be able to

CO1 – Understand about Requirement of Nutrients for microbes.
CO2 -Gain knowledge about different instruments in microbiological laboratory
CO3 – know about Microbial Growth
CO4 - Familiarize with Microbial Photosynthesis.
CO5 - Gain knowledge about Microbial Metabolism

Unit – I **(10Hours)**

Microbial Nutrition Nutritional types; Requirement of Nutrients for microbes and classification of microorganisms based on carbon, energy and electron sources viz. Photoautotrophs; Photoorganotrophs; Chemo-lithotrophs (ammonia, nitrate sulphur, hydrogen, iron oxidizing bacteria); Chemo-organotrophs. Primary and secondary active transport; Passive and facilitated diffusion.

Unit –II **(10Hours)**

Media type and Preservation Components; criteria and role of macro and micro-nutrients. Natural, Synthetic, Complex, Selective media & Differential Media; Methods for culturing aerobic and anaerobic bacteria; Colony and broth culture characteristics; Maintenance and preservation of Microorganisms.

Unit – III **(15 Hours)**

Microbial Growth (growth phases, generation time, growth curve). Measurement of cell mass and cell number; Factors affecting microbial growth; Continuous and batch cultures; details of synchronous and Diauxic growth curve. Physical factors influencing growth: Temperature; PH; Atmospheric Pressure; Salt Concentration. Chemical factors: heavy metal (copper), surfactants. Control of Microorganisms: patterns of microbial death, control of microorganism growth by antiseptics.

Unit – IV **(15 Hours)**

Microbial Photosynthesis: Concept of photosynthesis and associated pigments in microbes; photosynthetic apparatus in pro and eukaryotes; anoxygenic and oxygenic photosynthesis; light and dark reaction; photorespiration and its significance; Effect of light, temperature; pH and CO2 concentration on photosynthesis; measurement of net photosynthetic yield.

Unit – V **(10 Hours)**

Metabolism – EMP – HMP – ED pathways – TCA cycle- Electron transport chain –Oxidative and Substrate level phosphorylation.

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Text Books

1. Upadhyay & Upadhyay. Biophysical Chemistry, (2010). Himalaya Publishing House.
Page 10 of 80 B. Sc. Microbiology 2020-21 onwards - Affiliated COlleges - Annexure No.32A SCAA DATED: 23.09.2020
2. Dubey R.C. and Maheshwari, (2010). Text book of Microbiology, S.Chand Publications.

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1. Moat A.G. and Foster S.W. Microbial Physiology (4th Ed.) (2004). John Wiley and Sons, New York. 2. Gerald Karp. Cell Biology (3rd Ed.) (2003). McGraw Hill Book Company, New York.
3. Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. General Microbiology. (5th Ed.) (1987). McMillan Press. UK.
4. Dubey RC and Maheswari DK. A Text book of Microbiology. (2005).S. Chand &Company Ltd., New Delhi.
5. Nelson D. L. & Cox M. M. Lehninger's Principles of Biochemistry, 4th edition. (2005). W. H. Freeman & Co. NY. 6. Pelczar Jr, M J, Chan E C S., Krieg N R, Microbiology, (5th Ed.), (2001). McGraw Hill Book Company, NY.
6. Prescott's Microbiology 11thEd. Wm, C. Brown publishers.
7. Michael J. Pelczar, Jr. E.C.S. Chan, Noel R.Krieg, (1993). Microbiology 5thEd. Mc Graw Hill Book Company.
8. Caldwell. D.R.1995, Microbial physiology and Metabolism. WmC Brown Publishers, England.

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2. https://www.fishersci.se/se/en/scientific-products/centrifuge-guide/centrifugationtheory.html
3. https://en.m.wikipedia.org/wiki/Chromatography
4. https://en.m.wikipedia.org/wiki/Spectrometry
5. https://microbenotes.com/instruments-used-in-microbiology-lab/
6. https://www.swayam.gov.in

2.E.22.42

	L	T	P	C	Hrs
A20AET202					
PUBLIC ADMINISTRATION	**2**	**0**	**0**	**2**	**30**

(Compulsory Course designed as per the directions issued by Government of India, MHRD,)
Department of Higher Education (Central University Bureau)

F.No.19-6.2014-Desk U Dated 19-05-2014)

Course Objectives

- To introduce the elements of public administration
- To help the students obtain a suitable conceptual perspective of public administration
- To introduce them the growth of institution devices to meet the need of changing times
- To instill and emphasize the need of ethical seriousness in contemporary Indian Public Administration

Course Outcomes

After completion of the course, the students will be able to

CO1 – Understand the concepts and evolution of Public Administration.
CO2 – Be aware of what is happening in the Public Administration in the country.
CO3 – Explain the Territory Administration in the State and the Centre.
CO4 – Appreciate emerging issues in Indian Public Administration.

UNIT I INTRODUCTION TO PUBLIC ADMINISTRATION (7 Hrs)

Meaning, nature and Scope of Public Administration and its relationship with other disciplines- Evolution of Public Administration as a discipline — Woodrow Wilson, Henry Fayol , Max Weber and others - Evolution of Public Administration in India – Arthashastra – Colonial Administration upto 1947

UNIT II PUBLIC ADMINISTRATION IN INDIA (8 Hrs)

Enactment of Indian Constitution - Union Government – The Cabinet – Central Secretariat — All India Services – Training of Civil Servants – UPSC – NitiAyog – Statutory Bodies: The Central Vigilance Commission – CBI - National Human Rights Commission – National Women's Commission –CAG

UNIT III STATE AND UNION TERRITORY ADMINISTRATION (8 Hrs)

Differential Administrative systems in Union Territories compared to States Organization of Secretariat: - Position of Chief Secretary, Functions and Structure of Departments, Directorates – Ministry of Home Affairs supervision of Union Territory Administration – Position of Lt.Governor in UT – Government of Union Territories Act 1963 – Changing trend in UT Administration in Puducherry and Andaman and Nicobar Island.

UNIT IV EMERGING ISSUES IN INDIAN PUBLIC ADMINISTRATION (7 Hrs)

Changing Role of District Collector – Civil Servants – Politicians relationship – Citizens Charter - Public Grievance Redressal mechanisms — The RTI Act 2005 – Social Auditing and Decentralization – Public Private partnership.

2.E.22.43

Text Books:

1. Avasthi and Maheswari, "Public Administration", Lakshmi Narain Agarwal, 1st Edition, 2016.
2. Ramesh K.Arora, "Indian Public Administration: Institutions and Issues", New Age InternationalPublishers, 3rdEdition, 2012.
3. RumkiBasu, "Public Administration: Concept and Theories", Sterling, 1st Edition, 2013.

Reference Books:

1. Siuli Sarkar, "Public Administration in India", Prentice Hall of India, 2nd Edition, 2018.
2. M. Laxmikanth, "Public Administration", McGraw Hill Education, 1st Edition, 2011.
3. R.B.Jain, "Public Administration in India, 21st Century Challenges for Good Governance", Deep andDeepPublications, 2002.

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1. http://cic.gov.in/
2. http://www.mha.nic.in/
3. http://rti.gov.in/
4. http://www.cvc.nic.in/

2.E.22.44

	MICROBIAL DIVRSITY PRACTICALS	L	T	P	C	Hrs
A20MBL203		0	0	2	1	30

Course objective

- To learn the Culture characteristics of Microorganisms, culture media preparation, culture method, characterization of fungi alge and parasites.

Course Outcomes

After the completion of this course, the students will be able to

- Perform the Culture characteristics of Microorganisms, culture media preparation, culture method, characterization of fungi alge and parasites.

1. Microbiology Good Laboratory Practices and Biosafety
2. Culture characteristics of Microorganisms- colony morphology, shape, margin.
3. Microflora(Bacteria) in the environment by exposing NA plates to air
4. Microflora(Fungi) in the environment by exposing PD plates to air
5. Isolation of Bacteriophage from sewage sample
6. Anaerobic cultivation- candle jar, gas pack method.
7. Study of Rhizopus, Penicillium, Aspergillus
8. Study of Amoeba, Entamoeba, Paramecium and Plasmodium
9. Study of Spirogyra, Volvox and Chlamydomonas,

Text Books:

1. Microbiology Practical Manual, 1st Edition (Jain Amita) Elsevier India
2. Practical and applied microbiology (Anuradha De) 5th edition, Publisher: The National Book Book Depot
3. Mackie & Mccartney Practical Medical Microbiology, Publisher: Elsevier India 14th edition
4. Practical Manual for Undergraduates Microbiology (Mukesh Kumar) Publisher: Jain Brothers
5. SundararajT. Microbiology laboratory manual. Revised and published by AswathySundararaj.No.5 First Cross Street, Thirumalai Nagar,Perungudi, Chennai.

Reference Books:

1. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited.

2.. Practical Handbook of Microbiology (Emanual goldman,lorrence H Green) Publisher: Taylor & Francis Inc.

Web references:

3. https://www.cdc.gov/infectioncontrol/guidelines/disinfection/sterilization/index.html
4. https://microbiologysociety.org/publication/education-outreach-resources/basic-practical- microbiology-a- manual.html

2.E.22.45

	ANALYTICAL TECHNIQUES IN MICROBIOLOGY PRACTICALS	L	T	P	C	Hrs
A20MBL203		0	0	2	1	30

Course objective

- To learn the Analytical techniques used in Microbiology.

Course Outcomes

After the completion of this course, the students will be able to

- perform the Analytical techniques in Microbiology

1. pH meter and Preparation of Buffer – Acidic and Basic
2. molarity and normality solution preparation
3. Isolation of sub-cellular organelles.
4. Density gradient centrifugation
5. Spectrophotometry (visible & UV)
6. Paper chromatography
7. Thin layer chromatography
8. Column chromatography
9. Affinity chromatography

Text Books:

1. Analytical Techniques in Biotechnology by Suzy Hill, Syrawood Publishing House
2. A Handbook of Techniques in Biochemistry and Molecular Biology by Dr.Goutham, Laxmi Publications.

References Books:

1. Basic tools and techniques in Biotechnology by Sharma Jitendra, LAP Lambert Academic Publishing.

Web References:

1. https://scialert.net/fulltext/?doi=ajbmb.2014.1.7
2. https://www.researchgate.net/publication/322789684_
3. https://www.ispybio.com/search/protocols/purification%20protocol12.pdf
4. https://www.sigmaaldrich.com/IN/en/support/calculators-and-apps/molarity-calculator
5. https://www.thermofisher.com/in/en/home/life-science/protein-biology/protein-biology-learning-center/protein-biology-resource-library/pierce-protein-methods/cell-fractionation-organelle-isolation.html

2.E.22.46

		L	T	P	C	Hrs
A20MBL204	MICROBIAL PHYSIOLOGY PRACTICALS	0	0	2	1	30

Course objective

- To learn the Microbial phyiology practicals used in Microbiology.

Course Outcomes

After the completion of this course, the students will be able to

- perform the Microbial phyiology practicals used in Microbiology.

1. Introduction of media and its constituents for microbial growth.
2. Different methods for isolation and maintenance of microorganisms.
3. Isolation of microbes using differential media.
4. Effect of temperature, pH and salt on growth of E. coli
5. Biochemical test- Oxidase test, Catalase test, Urease test, Nitrate reduction test
6. To study and plot the growth curve of Aspergillus niger by radial growth measurements.
7. To study the effect of temperature of Aspergillus niger by dry weight method.
8. Demonstration of the thermal death time and decimal reduction time of E. coli.
9. Enzymatic Hydrolysis of Starch, Gelatin, Casein

Text Books:

1. Madigan MT, and Martinko JM (2014).Brock Biology of Microorganisms.14th edition. Prentice Hall International Inc.
2. 2. Moat AG and Foster JW. (2002). Microbial Physiology.4th edition. John Wiley & Sons
3. Reddy SR and Reddy SM. (2005). Microbial Physiology. Scientific Publishers India

References Books:

1. Gottschalk G. (1986). Bacterial Metabolism.2nd edition. Springer Verlag
2. Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. (1987). General Microbiology. 5th edition, McMillan Press.
3. Willey JM, Sherwood LM, and Woolverton CJ.(2013). Prescott's Microbiology.9th edition.

Web References:

1. https://www.google.com/search?q=1.%09Introduction+of+media+and+its+constituents+for+microbial
2. https://www.google.com/search?q=4.%09Effect+of+temperature%2C+pH+and+salt+on+growth

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A20MBS202	MEDICAL LABORATORY TECHNOLOGY	L	T	P	C	Hrs
		0	0	4	2	30

Course Objectives

- To gain basic knowledge on medical laboratory procedures
- To understand methods of measurable clinical parameters
- To understand basics of histopathology
- To understand the principles of biomedical equipment used indiagnosis
- To understand the principles Diagnostic Methods

Course Outcomes

After completion of the course, the students will be able to

CO1 - Understand the concepts of Organization of clinical laboratory and Safety measures.
CO2 - Understand Collection, processing.
CO3 - Describe methods of histopathological studies
CO4 - Preservation of blood and clinical samples.
CO5 - Define diagnostic principles and methods

UNIT I (6 hours)

Basic laboratory principles -Organization of clinical laboratory and Safety measures - personnel hygiene,code of conduct. Overview of Lymphatic system, Urinary system, respiratory system and circulatory system.

UNIT II (6 hours)

Sample collection - Urine, sputum, Blood. Types of blood collection: capillary puncture- venipuncture, Anticoagulants. Composition of blood. Outline of Hematopoiesis. ABO blood grouping, Rh typing. Blood transfusion- Donor selection, Screening of donor (history, age, weight, Hb, pulse, BP, temperature, interval, registration), Post donation care, Preservation of samples.

UNIT III (6 hours)

Blood cells count: Total count, differential cell count, platelet count, Hemoglobin Estimation, Packed cell volume (PCV) , Erythrocyte Sedimentation Rate [E.S.R.] — Westergren's Method, Bleeding time, clotting time, Latex agglutination test. Pregnancy test.

UNIT IV (6 hours)

Introduction to Histopathology, Tissue preparation, labeling, Fixation — Simple fixative, compound fixative, histochemical fixative, Dehydration- Ethyl alcohol – Acetone, Clearing, impregnation, embedding- Paraffin wax, sectioning. Microtome and its application. Staining of tissues - H&E Staining. Bio-Medical waste management- an overview.

UNIT V (6 hours)

Diagnostic Methods- Outline of Radio imaging, X-Ray, MRI, CT, Ultra sound scan, Mamography,ECG, EEG, Nephalometry, sphygmomanometer. Autoanalyser- Types ofAutoAnalysers-Semi and Fully automated Electrolyte Analyser (ISE). Need for Automation, Advantages of Automation.

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Practical

1. Blood collection
2. Differential count of Leucocyte
3. Estimation of Haemoglobin
4. Packed Cell Volume [PCV]
5. Erythrocyte Sedimentation rate [ESR]
6. Bleeding Time, Clotting Time.
7. Latex Agglutination
8. Liver function tests (SGPT, SGOT)
9. Pregnancy test

Reference books:

1. GradWohl, Clinical Laboratory-methods and diagnosis, Vol-IKanai L. Mukherjee,Medical Laboratory Technology Vol. I.Tata McGraw Hill 1996, NewDelhi.
2. Gradwohls, 2000. Clinical Laboratory Methods and Diagnosis. (ed)AlesC.3.Sonnenwirth and Leonard jarret, M.D. B.I. Publications, NewDelhi
4. Sood Ramnik,(2015), Text book of Medical Laboratory Technology,2ndedition,Jaypee Publications
5. Bernadette F. Rodak, George A. Fritsma, Kathryn Doig (2007) Hematology: ClinicalPrinciples and Applications 3rd Ed, Elsevier HealthSciences.
6. RamanicSood,LaboratoryTechnology(Methodsandinterpretation)4thEd.J.P.Bros,NewDelhi
7. Mukharji, Medical LaboratoryTechniques, Vol - I, II & III, 5th Edn. Tata McGrawHill, Delhi.

Web references:

1. https://www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf
2. file:///C:/Users/admin/Downloads/IARC%20Sci%20Pub%2016 3_Chapt er%20 3.pdf
3. https://www.cancer.gov/publications/dictionaries/ cancer- terms/def/blood-cell-count
4. https://histologylab.ctl.columbia.edu/HistologyLabManual.pdf
5. https://scert.kerala.gov.in/wp-content/uploads/2020/06/16-mlt.pdf

2. E. 22.49

		L	T	P	C	Hrs
A20EAL201	NATIONAL SERVICE SCHEME (Common to all B.A., B.Sc., B.Com., B.B.A., B.C.A.)	0	0	2	1	30

Course Objectives

- To introduce about various activities carried out by national service scheme.
- To gain life skills through community service.
- To gain awareness about various service activities performed in higher educational institutions.
- To give exposure about the use of technology to uplift the living standar
- ds of rural community.
- To induce the feeling of oneness through harmony of self and society.

Course Outcomes

After the end of the course, the students will able to

CO1 – Recognize the importance of national service in community development.
CO2 – Convert existing skills into socially relevant life skills.
CO3 – Differentiate various schemes provided by the government for the social development.
CO4 – Identify the relevant technology to solve the problems of rural community.
CO5 – Associate the importance harmony of nation with long term development.

UNIT I INTRODUCTION TO NATIONAL SERVICE SCHEME (6 Hrs)

History and objectives, NSS symbol, Regular activities, Special camping activities, Village adaptation programme, Days of National and International Importance, Hierarchy of NSS unit in college. Social survey method and Data Analysis. NSS awards and recognition. Importance of Awareness about Environment, Health, Safety, Genderissues, Government schemes for socialdevelopment and inclusion policy etc.,

UNIT II LIFE SKILLS AND SERVICE LEARNING OF VOLUNTEER (6 Hrs)

Communication and rapport building, problem solving, critical thinking, effective communication skills, decisionmaking, creative thinking, interpersonal relationship skills, self- awareness building skills, empathy, coping with stress and coping with emotions. Understanding the concept and application of core skills in social work practice, Team work, Leadership, Event organizing, resource planning and management, time management, gender equality, understanding rural community and channelizing the power of youth.

UNIT III EXTENSION ACTIVITIES FOR HIGHER EDUCATIONAL INSTITUTIONS (6 Hrs)

Objective and functions of Red Ribbon Club, Swatchh Bharath Abhiyan, Unnat Bharat Abhiyan, Jal Shakthi Abhiyan, Road Safety Club, Environmental club and Electoral literacy club.

UNIT IV USE OF TECHNOLOGY IN SOLVING ISSUES OF RURAL INDIA (6 Hrs)

Understanding community issues, economic development through technological development. Selection of appropriate technology, Understanding issues in agriculture, fishing, artisans, domestic animals, health and environment.

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UNIT V NATIONAL INTEGRATION AND COMMUNAL HARMONY (6 Hrs)

The role of Youth organizations in national integration, NGOs, Diversity of Indian Nation, Importance of National integration communal harmony for the development of nation, Indian Constitution, Building Ethical human Relationships, Universal Human Values, Harmony of self and Harmony of nation.

Reference Books:

1. Joseph, Siby K and Mahodaya Bharat (Ed.), " Essays on Conflict Resolution", InstituteofGandhian Studies, Wardha,2007.
2. Barman Prateeti and Goswami Triveni (Ed.), " Document on Peace Education", AkanshaPublishing House, New Delhi, 2009
3. Sharma Anand and G. Davi," Gandhian Way, Academic Foundation", New Delhi Myers SocialPsychology. New Delhi: Tata Mc.Graw Hill, 2007.
4. Taylor E. Shelly et.al , "Social Psychology ",12th Edition New Delhi, Pearson Prentice HallSingh, 2006.
5. Madhu, "Understanding Life Skills, background paper prepared for education for all: Theleap toequality, Government of India report", New Delhi, 2003.
6. Sandhan " Life Skills Education, Training Module, Society for education anddevelopment",2005.
7. Jaipur. Radakrishnan Nair and Sunitha Rajan , "Life Skill Education: Evidences form thefield",RGNIYD publication,Sriperumbudur,2012.
8. National Service Scheme Manual (Revised), Government of India, Ministry of YouthAffairs andSports, New Delhi.
9. M. B. Dishad, "National Service Scheme in India: A Case study of Karnataka,trust Publications,2001.

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1. http://www.thebetterindia.com/140/national-service-scheme-nss/
2. http://en.wikipedia.org/wiki/national-service-scheme 19=http://nss.nic.in/adminstruct
3. http://nss.nic.in/propexpan
4. http://nss.nic. in
5. http://socialworknss.org/about.html

2.E.22.51

2.E.22.52