Sadakathullah Appa College

(Autonomous)

(Reaccredited by NAAC at an 'A++' Grade. An ISO 9001:2015 Certified Institution)

Rahmath Nagar,Tirunelveli-11.

TamilNadu.

DEPARTMENT OF MICROBIOLOGY

CBCS SYLLABUS

Learning Outcome-Based Curriculum Framework For

Microbiology (B.Sc.)

(Applicable for students admitted in June 2024 and onwards)

(As per the Resolutions of the Academic Council Meeting held on 01.06.2024)

CONTENTS

Sadakathullah Appa College, Rahmath Nagar, Tirunelveli – 627 011.
Programme Structure & Credits – UG (Sciences)* - 2024 – 2027
MICROBIOLOGY

Sem	Part	Course Type	Title of the Course	Course Code	H/W	C	Marks		
							I	E	T
I	I	Lang-I	Prose	24ULAR11	6	3	25	75	100
			பொதுத் தமிழ் 1 - தமிழ் இலக்கிய வரலாறு - 1	24ULTA11					
	II	Lang-II	General English - I	24ULEN11	6	3	25	75	100
	III	Core-I	Fundamentals of Microbiology & Microbial diversity	24UCMB11	5	5	25	75	100
	III	Core-P-I	Techniques in Fundamentals of Microbiology & Microbial diversity	24UCMB1P	3	3	40	60	100
	III	EC-T-I (GE)	Basic and Clinical Biochemistry	24UAMB11	4	4	25	75	100
	III	EC-P-I (GE)	Techniques in basic and Clinical Biochemistry	24UAMB1P	2	1	20	30	50
	IV	SEC-I (NME)	Social and Preventive Medicine	24UNMB11	2	2	15	35	50
	IV	FC	Basics in Microbiology	24UFMB11	2	2	15	35	50
					30	**23**			**650**
II	I	Lang-I	Grammar	24ULAR21	6	3	25	75	100
			பொதுத் தமிழ் 2 - தமிழ் இலக்கிய வரலாறு - 2	24ULTA21					
	II	Lang-II	General English - II	24ULEN21	6	3	25	75	100
	III	Core-II	Microbial Physiology and Metabolism	24UCMB21	5	5	25	75	100
	III	Core-P-II	Techniques in microbial Physiology and Metabolism	24UCMB2P	3	3	40	60	100
	III	EC-T-II (GE)	Bioinstrumentation	24UAMB21	4	4	25	75	100
	III	EC-P-II (GE)	Techniques in Bioinstrumentation	24UAMB2P	2	1	20	30	50
	IV	SEC-II (NME)	Nutrition and health Hygiene	24UNMB21	2	2	15	35	50
	IV	SEC-III	Value Education –I	24USVE2A	2	2	15	35	50
			Value Education –II	24USVE2B					
					30	**23**			**650**

DEPARTMENTOF MICROBIOLOGY
Programme Outcomes

Upon completion of B.Sc. Degree Programme, the students will be able to:

PO 1 Disciplinary Knowledge

- Acquire scientific knowledge and an understanding of major concepts and theoretical principles.

PO 2 Creative Thinking and Practical Skills / Problem-Solving Skills

- Enrich skills of observation/research-related skills to draw logical inferences from scientific experiments/ programming and skills of creative thinking to develop novel ideas.
- Hone problem-solving skills in theoretical, experimental, and computational areas and apply them in research fields and real-life situations.

PO 3 Sense of inquiry and Skilled Communicator

- Develop the capability to raise appropriate questions relating to the current/emerging issues encountered in the scientific field and plan, execute, and express the results of experiments / investigations through technical writings and oral presentations

PO 4 Ethical Awareness / Team Work / Environmental Conservation and Sustainability

- Equip them for conducting work as an individual / as a member, or as a leader in diverse teams upholding values such as honesty and precision and thus preventing unethical behaviors such as fabrication, falsification, misrepresentation of data, plagiarism, etc.to ensure academic integrity.
- Realize that environment and humans are dependent on one another and know about the responsibe management of our ecosystem for survival and the well-being of the future generation.

PO 5 Usage of ICT/ Lifelong Learning / Self-Directed Learning

- Inculcate the habit of learning continuously through the effective adoption of ICT to update knowledge in the emerging areas in Sciences for inventions/discoveries and engage in remote/independent learning.

PO 6 Research-related skills:

- A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.
-

Programme Specific Outcomes

PSO	Upon completion of B.Sc. Microbiology Degree Programme, the students will be able to:	POs Mapped
PSO-1	Acquire sound knowledge in classification, taxonomy, structure, types of microorganisms and various fields of Applied Sciences.	PO1, PO2
PSO-2	Develop Experimental/Clinical/Problem solving skills to identify microorganisms in food, dairy, water and pharmaceuticals, microbial and molecular characterization, to diagnose and treat diseases.	PO2, PO5, PO6
PSO-3	Present the results of experiments/investigations effectively through technical writings as well as through oral presentations	PO1, PO6
PSO-4	Utilize various bio-wastes, marine sources as raw material for the production of various fermented products to reduce accumulation of wastes in the environment. Educate the public about various diseases and preventive measures.	PO1, PO4
PSO-5	Use ICT for updation of knowledge in current/emerging areas and to become skilled professionals	PO1, PO3

Semester - I	PROSE		24ULAR11			
LANG – I			L	T	P	C
Hrs./Week: 6	Hrs./Semester : 60	Marks :100	6	-	-	3

General Objective: To make the students to understand the structure of Arabic language and impove the reading and writing skills.

Learning Objectives

LO	The learners will be able to:
LO-1	Understand basic Arabic grammar.
LO-2	Understand the structure of Arabic language.
LO-3	Employ sentence making.
LO-4	Enhance vocabulary.
LO-5	Improve reading and writing skills.

UNIT I - من الدرس الأول إلى الدرس الرابع

UNIT II - من الدرس الخامس إلى الدرس الثامن

UNIT III – من الدرس التاسع إلى الدرس الثالث عشر

UNIT IV – من الدرس الرابع عشر إلى الدرس الثامن عشر

UNIT V – من الدرس التاسع عشر إلى الدرس الثالث و العشرون

Textbooks:

1. دروس اللغة العربية لغير الناطقين بها، الجزء الأول، الدكتور ف. عبد الرحيم

Reference Books:

1. معجم الكلمات الواردة في دروس اللغة العربية لغير الناطقين بها
2. مفتاح دروس اللغة العربية لغير الناطقين بها
3. القراءة الراشدة – للشيخ أبي الحسن علي الحسني الندوي
4. القراءة المفيدة – للدكتور محمد يوسف كوكن العمري
5. منهاج العربية -السيد النبي حيدرآبادي

www.alnahw.com

Course Outcomes

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO-1	Understand the correct pronunciation of Arabic letters	PSO 1	K2
CO-2	Apply the structure-based composition	PSO 1,2	K3
CO-3	List out the new vocabulary in Arabic	PSO 1	K4
CO-4	Evaluate and read the Arabic sentences without diacritical marks	PSO 1,2	K5
CO-5	Able to create the simple sentences in Arabic without errors.	PSO 1	K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
I	24ULAR11	PROSE	90	3

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	3	3	1	2	1	1	3	2	2	1	1
CO-2	3	3	1	2	1	1	3	2	2	1	1
CO-3	3	3	1	2	1	1	3	2	2	1	1
CO-4	3	3	1	2	1	1	3	2	2	1	1
CO-5	3	3	1	2	1	1	3	2	2	1	1

STRONG – 3, MEDIUM – 2 , LOW – 1

Prepared by : Dr. S.A.Mohamed Rafeek Checked by: Dr. J. Ubaiyathulla

Head of the Department

Semester - I	பொதுத்தமிழ் - 1		24ULTA11			
LANG – I	தமிழ் இலக்கிய வரலாறு - 1		L	T	P	C
Hrs./Week: 6	Hrs./Semester : 90	Marks :100	6	-	-	3

General Objective:

- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல் நடைமுறைகளை மேற்கொள்ளுதல்.

Learning Objectives:

LO	The learners will be able to:
LO - 1	தமிழ் இலக்கண, இலக்கியங்களை மாணவர்கள் அறியுமாறு செய்து அவர்களின் படைப்பாற்றலைத் தூண்டுதல்.
LO - 2	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்.
LO - 3	அற இலக்கியங்களை அறியச் செய்து வாழ்வின் விழுமியங்களை பயிற்றுவித்தல்.
LO - 4	காப்பியங்களை அறிமுகம் செய்து அதன் வழி வாழ்வியலை புரியச் செய்தல்.
LO - 5	பக்தி இலக்கியங்களின் மூலம் பக்தியுணர்வை ஊட்டுதல்.

அலகு 1 இலக்கணம்

1. தொல்காப்பியம், இறையனார் களவியல் உரை, நம்பியகப் பொருள், புறப்பொருள் வெண்பா மாலை, நன்னூல், தண்டியலங்காரம், யாப்பருங்கலக்காரிகை - நூல்கள்
2. மொழிப் பயிற்சி - ஒற்றுப்பிழை தவிர்த்தல்
    - வல்லினம் மிகும் இடங்கள்
    - வல்லினம் மிகா இடங்கள்
    - ஈரொற்று வரும் இடங்கள்
    - ஒரு, ஓர் வரும் இடங்கள்
    - அது, அ.ஃது வரும் இடங்கள்
    - தான், தாம் வரும் இடங்கள்

1. சங்க இலக்கியம் - எட்டுத் தொகை, பத்துப்பாட்டு.
2. அற இலக்கியம் - பதினெண்கீழ்க்கணக்கு நூல்கள்.
3. காப்பிய இலக்கியம் - ஐம்பெருங் காப்பியங்கள், ஐஞ்சிறு காப்பியங்கள், சமயக் காப்பியங்கள்.
4. பக்தி இலக்கியமும் (பன்னிரு திருமுறைகள் நாலாயிர திவ்வியப் பிரபந்தம்), பகுத்தறிவு இலக்கியமும் (சித்தர் இலக்கியங்கள், புலவர் குழந்தையின் இராவண காவியம்)

அலகு 2 சங்க இலக்கியம் - எட்டுத்தொகை, பத்துப்பாட்டு

எட்டுத்தொகை

1. நற்றிணை - முதல் பாடல் - நின்ற சொல்லர்
2. குறுந்தொகை 3 ஆம் பாடல் - நிலத்தினும் பெரிதே
3. ஐங்குறுநூறு - "நெல் பல பொலிக! பொன் பெரிது சிறக்க!"(முதல் பாடல்) வேட்கைப் பத்து.
4. கலித்தொகை - 51- சுடர்த்தொடீஇக் கேளாய் - குறிஞ்சிக் கலி.
5. புறநானூறு - 189 தெண்கடல் வளாகம் பொதுமையின்றி, நாடா கொன்றோ -187

பத்துப்பாட்டு

1. முல்லைப்பாட்டு (முழுவதும்)

அலகு 3 அற இலக்கியம் பதினெண்கீழக்கணக்கு நூல்கள்

1. திருக்குறள் - அறன் வலியுறுத்தல் அதிகாரம்
2. நாலடியார் - பாடல் : 131 (குஞ்சியழகும்)
3. நான்மணிக்கடிகை - நிலத்துக்கு அணியென்ப
4. பழமொழி நானூறு - தம் நடை நோக்கர்
5. இனியவை நாற்பது - 37 இளமையை மூப்பு என்று

அலகு 4 காப்பிய இலக்கியம் (ஐம்பெருங் காப்பியங்கள், ஐஞ்சிறு காப்பியங்கள், சமயக் காப்பியங்கள்)

1. சிலப்பதிகாரம் - வழக்குரைகாதை
2. மணிமேகலை - பாத்திரம் பெற்ற காதை
3. பெரியபுராணம் - பூசலார் நாயனார் புராணம்
4. கம்பராமாயணம் - குகப் படலம்
5. சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்
6. இயேசு காவியம் - ஊதாரிப்பிள்ளை

அலகு 5 பக்தி இலக்கியமும், பகுத்தறிவு இலக்கியமும் (பக்தி இலக்கியம் பன்னிரு திருமுறைகள், நாலாயிர திவ்வியப் பிரபந்தம் - பகுத்தறிவு இலக்கியம் (சித்தர் இலக்கியங்கள், புலவர் குழந்தையின் இராவண காவியம்)

பக்தி இலக்கியம்:

1. திருநாவுக்கரசர் தேவாரம் - "நாமார்க்கும் குடியல்லோம்" எனத் தொடங்கும் பாடல் மட்டும்
2. மாணிக்கவாசகர் திருவாசகம் - "நமச்சிவாய வாழ்க நாதன் தாள் வாழ்க" முதல் "சிரம்குவிவார் ஓங்குவிக்கும் சீரோன் கழல் வெல்க" வரை.
3. பொய்கையாழ்வார் - வையந் தகளியா வார்கடலே

4. பூதத்தாழ்வார் - அன்பே தகளியா
5. பேயாழ்வார் - திருக்கண்டேன் பொன்மேனி கண்டேன்
6. ஆண்டாள் - திருப்பாவை மார்கழித் திங்கள் (முதல் பாடல்)

பகுத்தறிவு இலக்கியம்

1. திருமூலர் - திருமந்திரம் (270, 271, 274, 275 285) பட்டினத்தார் திருவிடை மருதூர் (காடே திரிந்து – எனத் தொடங்கும் பாடல் பா.எண். 279, 280)
2. கடுவெளிச் சித்தர் - பாபஞ்செய் யாதிரு மனமே (பாடல் முழுவதும்)
3. இராவண காவியம் - தாய்மொழிப் படலம் - 18, ஏடுகையில்லா ரில்லை முதல்- 22 செந்தமிழ் வளர்த்தார் வரை.

பாட நூல்:

பதிப்பாசிரியர் முனைவர் ச.மகாதேவன், பொதுத்தமிழ் 1,
சதக்கத்துல்லாஹ் அப்பா கல்லூரி வெளியீடு,2024 – 2025(முதற் பதிப்பு).

பார்வை நூல்கள் :

1. மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அகாதெமி, புதுடெல்லி.
2. மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
4. தமிழ் இலக்கிய வரலாறு – முனைவர்.சிற்பி பாலசுப்ரமணியம், முனைவர்.சொ.சேதுபதி
5. புதிய தமிழ் இலக்கிய வரலாறு – முனைவர்.சிற்பி பாலசுப்ரமணியம், நீல.பத்மநாபன்
6. தமிழ் இலக்கிய வரலாறு - டாக்டர்.அ.கா.பெருமாள்
7. தமிழ் இலக்கிய வரலாறு - முனைவர். ப.ச.ஏசுதாசன்
8. தமிழ் இலக்கிய வரலாறு – ஸ்ரீகுமார்
9. வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு – பாக்கியமேரி
10. தமிழ் பயிற்றும் முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் பதிப்பகம், சிதம்பரம்

- https://www.chennailibrary.com/
- https://www.sirukathaigal.com
- https://www.tamilvirtualuniversity.org
- https://www.noolulagam.com
- https://www.katuraitamilblogspot.com

Course Outcomes

CO	Upon completion of this course, students will be able to	PSO Addressed	Cognitive Level
CO-1	மொழியறிவோடு சிந்தனைத் திறனைப் பெறுவர்.	1, 2, 3	K4
CO-2	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்.	1, 4	K3, K4
CO-3	அற இலக்கியம் தமிழ்க் காப்பியங்களின் வழி வாழ்வியல் சிந்தனையைப் பெறுவர்.	2.3,4	K3, K4,
CO-4	பக்தி இலக்கியங்களைக் கற்பதன் மூலம் பக்தி நெறியினை அறிவர்.	4,5	K3, K6
CO-5	பகுத்தறிவு இலக்கியங்களைக் கற்பதன் வழி சமய நல்லிணக்கத்தைப் பின்பற்றுவர்.	2,3,4	K5, K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
I	24ULTA11	தமிழ் இலக்கிய வரலாறு - 1	90	3

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	2	3	3	3	2	2	2	3	2	3
CO-2	3	3	2	2	2	3	2	3	3	2	2
CO-3	3	2	3	3	2	2	2	3	2	3	2
CO-4	-	3	3	2	2	2	3	2	3	2	2
CO-5	-	3	2	2	2	3	3	2	2	2	2

3 - STRONG, 2 - MEDIUM, 1- LOW

Prepared by : Dr. A.S. Shaik Sindha

Checked by: Dr.S.Mahadevan

Head of the Department

Semester - I	General English - 1		24ULEN11			
LANG- II			L	T	P	C
Hrs./Week: 6	Hrs./Semester : 90	Marks :100	6	-	-	3

General Objective:

To train learners to communicate effectively, think critically, and express themselves creatively.

Learning Objectives (LO)

LO	The learners will be able to :
LO – 1	Acquire self-awareness and develop positive thinking which are required in various situations.
LO – 2	Develop the attribute of empathy
LO – 3	Acquire creative and critical thinking skills
LO – 4	Learn the basics of grammar
LO – 5	Develop Listening, Speaking, Reading and Writing (LSRW) skills

Unit - I

The Skill-focused: Self-Awareness and Positive Thinking

Autobiography

1. *I am Malala* (Chapter 1) by Malala Yousafzai.
2. *The Story of My Experiments with Truth* (Chapters 1, 2 and 3) by M.K.Gandhi.

Poetry

1. "Where the Mind is Without Fear" (*Gitanjali*, Verse – 35) by Rabindranath Tagore
2. "Love Cycle by Chinua Achebe"

Unit – II

The Skill Focused: Empathy

Poetry

1. "Nine Gold Medals" – David Roth
2. "Alice Fell or Poverty" – William Wordsworth

Short Story

1. The School for Sympathy – E.V. Lucas
2. Barn Burning – William Faulkner

Unit – III

The Skills Focused:Critical and Creative Thinking

Poetry

1. "The Things That Haven't Been Done Before" – Edgar Guest
2. "Stopping by the Woods on a Snowy Evening" – Robert Frost

Readers Theatre

1. The Magic Brocade – A Tale of China
2. “Three Sideway Stories from Wayside School” by Louis Sachar adapted from the book *Stories on Stage* by Aaron Shepard.

Unit – IV

Parts of Speech

1. Articles
2. Noun
3. Pronoun
4. Verb
5. Adverb
6. Adjective
7. Preposition

Unit – V

Paragraph and Essay Writing

1. Descriptive
2. Expository
3. Persuasive
4. Narrative

Reading Comprehension

Types of Reading: Extensive and Intensive Reading
Vocabulary Building
Critical text analysis
Deep reading (Pages 72 to 84 from TANSCHE Syllabus - 2022)

Textbooks

1. Malala Yousafzai. *I am Malala*, Little, Brown and Company, 2013.
2. M.K. Gandhi. *An Autobiography* or *The Story of My Experiments with Truth* (Chapter – I), Rupa Publications, 2011.
3. Rabindranath Tagore. "Gitanjali 35" from *Gitanjali* (Song Offerings): A Collection of Prose Translations made by the Author from the Original Bengali. Mac Millan, 1913.
4. N. Krishnasamy, *Modern English: A Book of Grammar, Usage and Composition*, Macmillan, 1975.
5. Aaron Shepard. *Stories on Stage*, Shepard Publications, 2017.
6. J.C. Nesfield. *English Grammar, Composition and Usage*, Macmillan, 2019.

Web Sources

1. Malala Yousafzai. I am Malala (Chapter 1) https://archive.org/details/i-am-malala.
2. M.K Gandhi. An Autobiography or The Story of My Experiments with Truth (Chapter-1)-Rupa Publication, 2011. https://www.indiastudychannel.com/resources/146521-Book-

Review-An-Autobiography-or-The-story-of-my-experiments-with-Truth.aspx
3. Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings) https://www.poetryfoundation.org/poems/45668/gitanjali-35
4. Aaron Shepard.Stories on Stage, Shepard Publications, 2017. https://amzn.eu/d/9rVzlNv
5. J C Nesfield. Manual of English Grammar and Composition.https://archive.org/details/in.ernet.dli.2015.44179

Course Outcomes

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO-1	Understand self- awareness and positive thinking required in various life situations	1,2,3	K1, K2
CO-2	Acquire the attribute of empathy.	1,2,3,4	K2, K3
CO-3	Develop creative and critical thinking abilities.	1,2,3,4	K3, K4
CO-4	Explain basic grammar, develop and integrate the use of four language skills (LSRW)	2, 3	K4, K5
CO-5	Compose original poems and personal narratives.	1,2,3,4	K5, K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 - Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
1	24ULEN11	General English 1	90	3

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	1	2	3	3	3	3	3	3
CO2	3	3	3	1	2	3	3	3	3	1	1
CO3	3	3	1	3	3	2	3	3	3	1	1
CO4	3	3	1	2	1	3	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3	3

STRONG – 3, MEDIUM – 2 AND LOW - 1

Prepared by: Dr.L.Faustina Leo

Checked by
Dr.S.Mohamed Haneef
Head of the Department

Semester - I	FUNDAMENTALS OF MICROBIOLOGY & MICROBIAL DIVERSITY		24UCMB11			
Core – I			L	T	P	C
Hrs./Week: 5	Hrs./Semester : 75	Marks :100	5	-	-	5

General Objective: Understand the basics of microbiology and microbial diversity, including microbial structure, growth, reproduction, cultivation, and laboratory techniques.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Learn the history, classification, ecological roles, and conservation of microorganisms.
LO – 2	Understand the features and structures of cellular and acellular microorganisms, and compare prokaryotic and eukaryotic cells.
LO – 3	Master bacterial culture media, isolation techniques, growth measurement, and anaerobic culture methods.
LO – 4	Learn the principles and applications of different microscopy techniques and staining methods.
LO – 5	Understand and apply sterilization methods, and learn about disinfection, antiseptic techniques, and antimicrobial agents.

UNIT I: History, Classification and Biodiversity of Microorganisms

History and Evolution of Microbiology, Classification – Three kingdom, five kingdom, six kingdom and eight kingdom. Microbial biodiversity: Introduction to microbial biodiversity- ecological niche. Basic concepts of Eubacteria, Archaebacteria and Eucarya. Conservation of Biodiversity.

UNIT II: Characteristics and Structures of Microorganisms

General characteristics of cellular microorganisms (Bacteria, Algae, Fungi and Protozoa) and acellular microorganisms - (Viruses, Viroids, Prions), Differences between prokaryotic and eukaryotic microorganisms. Structure of Bacterial cell wall, cell membrane, capsule, flagella, pili, mesosomes, chlorosomes, phycobilisomes, spores, and gas vesicles. Structure of fungi (Mold and Yeast), Structure of microalgae.

UNIT III: Bacterial Culture Techniques and Growth Measurement

Bacterial culture media and pure culture techniques. Mode of cell division, Quantitative measurement of growth, Anaerobic culture techniques.

UNIT IV: Microscopy and Staining Techniques

Microscopy – Simple, bright field, dark field, phase contrast, fluorescent, electron microscope – TEM & SEM, Confocal microscopy, and Atomic Force Microscopy. Stains and staining methods.

UNIT V: Methods of Sterilization and Antimicrobial Agents

Sterilization–moist heat - autoclaving, dry heat – Hot air oven, radiation – UV, Ionization, filtration – membrane filter and disinfection, antiseptic; Antimicrobial agents.

Text Books

1. Pelczar.M. J., Chan E.C.S. and Noel. R.K. (2007). Microbiology. 7thEdition, McGraw –Hill, New York.
2. Willey J., Sherwood L., and Woolverton C. J., (2017). Prescott's Microbiology. 10th Edition, McGraw-Hill International edition.
3. Tortora, G.J., Funke, B.R., Case, C.L. (2013). Microbiology. An Introduction 11thEdition, A La Carte Pearson.
4. Salle. A.J (1992). Fundamental Principles of Bacteriology. 7thEdition. McGraw Hill Inc.New York.
5. Boyd, R.F. (1998). General Microbiology, 2ndEdition. Times Mirror, Mosby College Publishing, St Louis.
6. Prabhu.D, Janet Rani.R*et.al.,* (2024). Fundamental of Microbiology, 1st Edition, Matjeni Publishers, Sivakasi.

References Books

1. Jeffrey C. Pommerville., Alcamo's Fundamentals of Microbiology (9thEdition). Jones &Bartlett learning 2010.
2. Stanier R.Y, Ingraham J. L., Wheelis M. L., and Painter R. R. (2010). General Microbiology, 5thEdition., MacMillan Press Ltd Tortora, G.J., Funke, B.R. and, Case, C.L (2013). Microbiology-An Introduction, 11thEdition, Benjamin Cummings.
3. Nester E., Anderson D., Roberts C. E., and Nester M. (2006). Microbiology-A Human Perspective, 5thEdition, McGraw Hill Publications.
4. Madigan M.T., Martinko J.M., Stahl D.A, and Clark D. P. (2010). Brock - Biology of Microorganisms, 13th Edition Benjamin-Cummings Pub Co.

Web Resources

1. https://www.cliffsnotes.com/study-guides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology

2. https://www.keyence.com/ss/products/microscope/bz-x/study/principle/structure.jsp
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6604941/#
4. https://bio.libretexts.org/@go/page/9188
5. https://courses.lumenlearning.com/boundless-microbiology/chapter/microbial-nutrition/

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Analyze the historical events that led to major scientific discoveries and inventions, understanding the classification of microorganisms.	1,5,6	K4
CO 2	Acquire detailed knowledge of the structure and functions of prokaryotic cell organelles and understand their role in cellular processes.	1,5,6	K2
CO 3	Develop practical skills in various microbiological techniques, including the use of different types of media and methods for culturing microorganisms.	1,2,3,5,6	K3
CO 4	Explain and demonstrate the principles and working mechanisms of different microscopes, highlighting their functions and applications in scientific research.	1,2,5,6	K3
CO 5	Understand and apply the concepts of asepsis, sterilization, and the use of disinfectants to maintain laboratory safety and prevent contamination.	1,4,5,6	K3

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	24UCMB11	FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERSITY	75	5

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO – 1	3	2	2	2	3	3	3	2	2	3	3
CO – 2	3	2	2	2	3	3	3	2	2	2	3
CO – 3	3	3	3	2	3	3	3	3	3	2	3
CO – 4	3	3	2	2	3	3	2	3	3	2	3
CO – 5	3	2	2	3	3	3	2	3	2	2	3
STRONG (3), MEDIUM (2) and LOW (1)											

Prepared by : Mr.S.Hameedullah Sherief Checked by: Dr.R.Janet Rani

Head of the Department

Semester - I	TECHNIQUES IN FUNDAMENTALS OF MICROBIOLOGY & MICROBIAL DIVERSITY		24UCMB1P			
Core – I P			L	T	P	C
Hrs./Week: 3	Hrs./Semester : 45	Marks :100	-	-	3	3

General Objectives: Understand, analyze, and apply basic microbiological techniques and concepts of microbial diversity.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Acquire knowledge on Cleaning of glass wares, GLP and sterilization.
LO – 2	Gain knowledge on media preparation and cultural characteristics.
LO – 3	Prepare and quality-check various media, and practice pure culture techniques.
LO – 4	Learn the microscopic techniques and staining methods.
LO – 5	Perform staining techniques and study microbial diversity.

Course Outline

1. Microbiological good laboratory practice and safety
2. Cleaning of glass wares
3. Media Preparation I
   (Liquid, Soild, Semi-solid media, Agar slants, Agar deeps, Agar plates)
4. Media Preparation II
   (Basal, Differential, Enriched, Enrichment, Transport & Selective Medias)
5. Sterilization Methods (Autoclave, Hot air oven & Membrane filtration)
6. Pure culture techniques (Decimal dilution, Pour & Streak Plate)
7. Culture characteristics of microorganisms:

a) Microbial growth on different media

b) Growth characteristics and description (Colonial characteristics)

8. Staining techniques (Smear preparation, Simple, Gram's & Endospore staining)
9. Preparation of Slide (Wet mount Method)
10. Bacterial Motility (Hanging drop Technique)
11. Growth of microbes using Hay Infusion Experiment
12. Microscopy (Light & Bright field)
13. Demonstration of pigment production
14. Growth supporting properties & Quality control of microbiological media
15. Sterility testing of microbiological items & Microbiological media

Textbooks:

1. James G Cappucino and N. Sherman MB (1996). A lab manual Benjamin Cummins, New York 1996.
2. Kannan. N (1996). Laboratory manual in General Microbiology. Palani Publications.
3. Sundararaj T (2005). Microbiology Lab Manual (1st edition) publications.
4. Gunasekaran, P. (1996). Laboratory manual in Microbiology. New Age International Ld., Publishers, New Delhi.
5. R C Dubey and D K Maheswari (2002). Practical Microbiology. S. Chand Publishing.

References Books:

1. Atlas.R (1997). Principles of Microbiology, 2nd Edition, Wm.C.Brown publishers.
2. Amita J, Jyotsna A and Vimala V (2018). Microbiology Practical Manual. (1st Edition). Elsevier India
3. Talib VH (2019). Handbook Medical Laboratory Technology. (2nd Edition). CBS
4. Wheelis M, (2010). Principles of Modern Microbiology, 1st Edition. Jones and Bartlett Publication.
5. Lim D. (1998). Microbiology, 2nd Edition, WCB McGraw Hill Publications.

Web Resources:

1. http://www.biologydiscussion.com/micro-biology/sterilisation-and-disinfection-methods-and-principles-microbiology/24403.
2. https://www.ebooks.cambridge.org/ebook.jsf?bid=CBO9781139170635
3. https://www.grsmu.by/files/file/university/cafedry//files/essential_microbiology.pdf
4. https://microbiologyinfo.com/top-and-best-microbiology-books/
5. https://www.cliffsnotes.com/studyguides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO – 1	Apply good laboratory practices, safety protocols, and sterilization methods in microbiological labs.	1,2,3,4,5	K3
CO – 2	Prepare and utilize various types of microbiological media for culturing microorganisms.	1,2,3,4,5	K3
CO – 3	Prepare specialized microbiological media, perform quality control, and master pure culture techniques.	1,2,3,4,5	K3
CO – 4	Analyze microbial growth characteristics and demonstrate proficiency in using light and bright field microscopy.	1,2,3,4,5	K4
CO – 5	Perform various microbial staining techniques and study microbial diversity using microscopy methods.	1,2,3,4,5	K3

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	**24UCMB1P**	**TECHNIQUES IN FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERSITY**	**45**	**3**

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PSO1**	**PSO 2**	**PSO3**	**PSO 4**	**PSO5**
CO – 1	3	3	3	3	3		3	3	3	3	3
CO – 2	3	3	3	3	3		3	3	3	3	3
CO – 3	3	3	3	3	3		3	3	3	3	3
CO – 4	3	3	3	3	3		3	3	3	3	3
CO – 5	3	3	3	3	3		3	3	3	3	3
STRONG (3), MEDIUM (2) and LOW (1)											

Prepared by : Mr.S.Hameedullah Sherief Checked by: Dr.R.Janet Rani

Head of the Department

Semester - I	BASIC AND CLINICAL BIOCHEMISTRY		24UAMB11			
EC – I (Allied)			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	4	-	-	4

General Objective:

Understand fundamental principles of basic and clinical biochemistry.

LEARNING OBJECTIVES

CO	The learners will able to:
LO – 1	Attain thorough knowledge on carbohydrates and lipids, their characteristic properties and organization in carrying out all the living functions which constitute the life.
LO – 2	Explain the biological activity of amino acids and proteins.
LO– 3	Identify the metabolic errors in enzymes of carbohydrates and lipids.
LO– 4	Describe the disorders in amino acid metabolism.
LO– 5	Interpret the consequences, biochemical, clinical features, diagnosis and treatment of metabolic diseases of day today life.

Unit I: Biomolecules: Carbohydrates and Lipids

Biomolecules -Carbohydrate – General properties, function, structure, classification– monosaccharides (Glucose, Fructose, Galactose), Oligoaccharides (Sucrose, Maltose, Lactose) and polysaccharides (Starch, Glycogen,) and biological significance. Lipids – General properties, functions, structure, classification (Simple, Derived and Complex), Cholesterol, LDL, HDL – biological significance.

Unit II: Biomolecules: Amino Acids and Proteins

Biomolecules - Amino acids – General properties, functions, structure, classification and biological significance. Proteins– General structure, Properties, functions, classification and biological significance.

Unit III: Metabolic Disorders: Carbohydrate and Lipid Metabolism

Disorders of Metabolism: Disorders of carbohydrate metabolism: diabetes mellitus, ketoacidosis, hypoglycemia, glycogen storage diseases, galactosemia and lactose intolerance. Disorders of lipid metabolism: hyperlipidemia, hyperlipoproteinemia, hypercholesterolemia, hypertriglyceridemia, sphingolipidosis

Unit IV: Metabolic Disorders: Amino Acid Metabolism

Disorders of Metabolism: Disorders of amino acid metabolism: alkaptonuria, phenylketonuria, phenylalaninemia, homocystineuria, tyrosinemia, aminoaciduria

Unit V: Assessment of Organ Function and Diagnostic Enzymes

Evaluation of organ function tests: Assessment and clinical manifestations of renal, hepatic, pancreatic, gastric and intestinal functions. Diagnostic enzymes: Principles of diagnostic enzymology. Clinical significance of aspartate aminotransferase, alanine aminotransferase, creatine kinase, aldolase and lactate dehydrogenase

TEXT BOOKS

1 Satyanarayana, U. and Chakrapani, U(2014).Biochemistry,4th Edition, Made Simple Publisher.

2 Jain J L, Sunjay Jain and Nitin Jain (2016).Fundamentals of Biochemistry, 7th Edition, S Chand Company.

3 AmbikaShanmugam's (2016). Fundamentals of Biochemistry for Medical Students, 8th Edition. Wolters Kluwer India Pvt Ltd.

4 Vasudevan. D.M.Sreekumari.S, Kannan Vaidyanathan (2019). Textbook Of Biochemistry For Medical Students. Kindle edition, Jaypee Brothers Medical Publishers

5 Jeremy M. Berg, LubertStryer, John L. Tymoczko, Gregory J. Gatto (2015). Biochemistry, 8th edition. WH Freeman publisher.

REFERENCES BOOKS

1 AmitKessel&Nir Ben-Tal (2018). Introduction to Proteins: structure, function and motion. 2ndEdition, Chapman and Hall.

2 David L. Nelson and Michael M. Cox (2017).Lehninger Principles of Biochemistry, 7thEdition W.H. Freeman and Co., NY.

3 LupertStyrer, Jeremy M. Berg, John L. Tymaczko, Gatto Jr., Gregory J (2019). Biochemistry. 9thEdition, W.H.Freeman& Co. New York.

4 Donald Voet, Judith Voet, Charlotte Pratt (2016). Fundamentals of Biochemistry: Life at the Molecular Level, 5th Edition, Wiley.

5 Joy PP, Surya S. and AswathyC (2015). Laboratory Manual of Biochemistry, Edition 1., Publisher:Kerala agricultural university.

WEB RESOURCES

1 https://www.abebooks.com › plp
2 https://kau.in/document/laboratory-manual-biochemistry
3 https://metacyc.org
4 https://www.medicalnewstoday.com
5 https://journals.indexcopernicus.com

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Explain the structure, classification , biochemical functions and significance of carbohydrates and lipids	1,2,5	K2 & K4
CO 2	Differentiate essential and non-essential amino acids, biologically important modified amino acids and their functions, Illustrate the role, classification of Proteins and recognize the structural level organization of proteins, its functions and denaturation.	1,2,5	K2 & K4
CO 3	Assess defective enzymes and Inborn errors. Recognize diseases related to carbohydrate and lipid metabolism.	1,2,3,4,5	K4 & K5
CO 4	Discuss and evaluate the pathology of aminoacid metabolic disorders.	1,2,3,4,5	K5
CO 5	Appraise the imbalances of enzymes in organ function and relate the role of Clinical Biochemistry in screening and diagnosis.	1,2,3,4,5	K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
I	**21UAMB11**	**BASIC AND CLINICAL BIOCHEMISTRY**	**60**	**4**

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PSO1**	**PSO 2**	**PSO3**	**PSO 4**	**PSO5**
CO – 1	3	3	2	2	3		3	2	3	2	3
CO – 2	3	3	2	2	3		3	2	3	2	3
CO – 3	3	3	3	3	3		3	3	3	3	3
CO – 4	3	3	3	3	3		3	3	3	3	3
CO – 5	3	3	3	3	3		3	3	3	3	3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.K.Chitra

Checked by: Dr.R.Janet Rani

Head of the Department

Semester - I	TECHNIQUES IN BASIC AND CLINICAL BIOCHEMISTRY		24UAMB1P			
EC – IP (Allied)			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	-	-	2	1

General Objective:

To equip students with essential skills in biochemical techniques for clinical diagnosis and analysis.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Acquire knowledge on qualitative analysis of biomolecules.
LO – 2	Gain knowledge on estimation of sugar in biological sample.
LO – 3	Learn the technique to estimate the protein content in biological sample
LO – 4	Learn the technique to estimate cholesterol
LO – 5	Acquire knowledge on fat analysis

Course Outline:

1. Qualitative analysis of Carbohydrate
2. Qualitative analysis of Protein
3. Qualitative analysis of lipids
4. Quantitative estimation of Carbohydrate by Anthrone method
5. Quantitative estimation of Protein by Lowry's method
6. Quantitative estimation of Cholestrol by Zlatki's method
7. Determination of saponification value of fat
8. Determination of Acid value of fat

TEXT BOOKS

1 James G Cappucino and N. Sherman MB(1996). A lab manual Benjamin Cummins, New York 1996.

2 Kannan. N (1996). Laboratory manual in General Microbiology. Palani Publications.

3 Sundararaj T (2005). Microbiology Lab Manual (1st edition) publications.

4 Gunasekaran, P. (1996). Laboratory manual in Microbiology. New Age International Ld., Publishers, New Delhi.

5 R C Dubey and D K Maheswari (2002). Practical Microbiology. S. Chand Publishing.

REFERENCES BOOKS

1 Atlas.R (1997). Principles of Microbiology, 2nd Edition, Wm.C.Brown publishers.

2 Amita J, Jyotsna A and Vimala V (2018). Microbiology Practical Manual. (1st Edition). Elsevier India

3 Talib VH (2019). Handbook Medical Laboratory Technology. (2nd Edition). CBS

4 Wheelis M, (2010). Principles of Modern Microbiology, 1st Edition. Jones and Bartlett Publication.
5 Lim D. (1998). Microbiology, 2nd Edition, WCB McGraw Hill Publications.

WEB RESOURCES

1 http://www.biologydiscussion.com/micro-biology/sterilisation-and-disinfection-methods-and-principles-microbiology/24403.
2 https://www.ebooks.cambridge.org/ebook.jsf?bid=CBO9781139170635
3 https://www.grsmu.by/files/file/university/cafedry//files/essential_microbiology.pdf
4 https://microbiologyinfo.com/top-and-best-microbiology-books/
5 https://www.cliffsnotes.com/studyguides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Practice the Qualitative analysis of carbohydrate, protein, lipids sterilization methods; learn to prepare media and their lipids	1,2,3,4,5	Understand & Apply
CO 2	Learn the technique for the quantitative determination of carbohydrate.	1,2,3,4,5	K1&K3
CO 3	Understand the methods of quantitative determination of protein.	1,2,3,4,5	K1&K3
CO 4	Learn the method quantitative determination of cholesterol	1,2,3,4,5	K1&K3
CO 5	Study on the acid value and saponification value of fat	1,2,3,4,5	K1&K4

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course					Hours	Credit			
I	**24UAMB1P**	**TECHNIQUES IN BASIC AND CLINICAL BIOCHEMISTRY**					**30**	**1**			
Course Outcomes (COs)	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO – 1	3	3	3	3	3		2	3	3	2	3
CO – 2	3	3	3	3	3		2	3	3	2	3
CO – 3	3	3	3	3	3		2	3	3	2	3
CO – 4	3	3	3	3	3		2	3	3	2	3
CO – 5	3	3	3	3	3		2	3	3	2	3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.K.Chitra Checked by: Dr.R.Janet Rani

Head of the Department

Semester - I	SOCIAL AND PREVENTIVE MEDICINE		24UNMB11			
SEC – I (NME)			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

General Objective: To understand and apply the principles of social and preventive medicine to promote health, prevent disease and improve community health outcomes.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Describe the concepts of health and disease and their social determinants
LO – 2	Summarize the health management system
LO – 3	Know about the various health care services
LO – 4	Outline the goals of preventive medicine
LO – 5	Gain knowledge about alternate medicine

UNIT: I - Social Medicine: History, Concepts and Health Policies

Introduction to social medicine:H22istory of social medicine-concepts of health and disease-social determinants of health and disease-Health and quality of life-Health information system- measures of population health-health policies.

UNIT: II -Health Management and National Health Programs

Health management:Applications of behavioral sciences and psychology in health management- nutritional programs for health management-water and sanitation in human health-national programs for communicable and non-communicable diseases- environmental and occupational hazards and their control.

UNIT: III -Community Health Care and Services

Health care and services:Health care of the community-information, education, communication and training in health-maternal & child health-school health services- Geriatrics-care and welfare of the aged-mental health-health services through general practitioners.

UNIT: IV -Principles and Practices of Preventive Medicine

Preventive medicine: Introduction- role of preventive medicine- levels of prevention-Risk assessment in communities and vulnerable population – surveillance, monitoring and reporting of disease outbreaks - forecasting and control measures in community setting – early detection methods.

UNIT: V -Alternate Medicine and Global Health Response to Epidemics

Prevention through alternate medicine:Unani, Ayurveda, Homeopathy, Naturopathy systems in epidemic and pandemic outbreaks. International health regulations. Infectious disease outbreak case studies and precautionary response during SARS and MERS corona virus, Ebola and novel SARS-COV2 outbreaks.

Text Books

1. Park.K (2021). Textbook of preventive and social medicine, 26th edition. Banarsidas Bhanot publishers.
2. Mahajan & Gupta (2013). Text book of preventive and social medicine, 4th edition. Jaypee brothers medical publishers.
3. Chun-Su Yuan, Eric J. Bieber, Brent Bauer (2006). Textbook of Complementary and Alternative Medicine. Second Edition. Routledge publishers.
4. Vivek Jain (2020). Review of Preventive and Social Medicine: Including Biostatics. 12th edition, Jaypee Brothers Medical Publishers.
5. Lal Adarsh Pankaj Sunder (2011). Textbook of Community Medicine: Preventive and Social Medicine, CBS publisher.

References Books

1. Howard Waitzkin, Alina Pérez, Matt Anderson (2021). Social Medicine and the coming Transformation. First Edition. Routledge publishers.
2. GN Prabhakara (2010). Short Textbook of Preventive and Social Medicine. Second Edition. Jaypee publishers.
3. Jerry M. Suls, Karina W. Davidson, Robert M. Kaplan (2010). Handbook of Health Psychology and Behavioral Medicine. Guilford Press.
4. Marie Eloïse Muller, Marie Muller, MarthieBezuidenhout, Karien Jooste (2006). Health Care Service Management. Juta and Company Ltd.
5. Geoffrey Rose (2008).Rose's Strategy of Preventive Medicine: The Complete.OUP Oxford.

Web Resources

1. https://www.omicsonline.org/scholarly/social--preventive-medicine-journals-articles-ppts-list.php
2. https://www.teacheron.com/online-md_preventive_and_social_medicine-tutors
3. https://www.futurelearn.com
4. https://www.healthcare-management-degree.net
5. https://www.conestogac.on.health-care-administration-and-service-management

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Identify the health information system	1,6	K2
CO 2	Associate various factors with health management system	1,2, 3,6, 9	K2
CO 3	Choose the appropriate health care services	1,6	K3
CO 4	Appraise the role of preventive medicine in community setting	4,6	K5
CO 5	Recommend the usage of alternate medicine during outbreaks	1,6	K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course					Hours	Credits			
I	**24UNMB11**	**SOCIAL AND PREVENTIVE MEDICINE**					**30**	**2**			
Course Outcomes (COs)	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**				
	PO 1	**PO 2**	**P O 3**	**PO 4**	**PO 5**	**PO 6**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO – 1	**3**	2	**2**	**3**	**3**			**2**	3	**3**	**3**
CO – 2	**3**	2	**2**	**3**	**3**			**2**	**3**	**3**	**3**
CO – 3	**3**	**3**	**3**	**3**	**3**			**3**	**3**	**3**	**3**
CO – 4	**3**	**3**	**3**	**3**	**3**			**3**	**3**	**3**	**3**
CO – 5	**3**	**3**	**3**	**3**	**3**			**3**	**3**	**3**	**3**
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.S.Meenakshi

Checked by: Dr.R.Janet Rani
Head of the Department

Semester - I	BASICS IN MICROBIOLOGY		24UFMB11			
FC			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

General Objective:

To understand the fundamental principles, concepts andrecent developments of microbiology.

LEARNING OBJECTIVES

LO	The learners will able to:
LO 1	Summarize the basic characters, structures, classification, properties of viruses.
LO 2	Demonstrate the basic characters, structures and classification of algae
LO 3	Understand the basic characters, classification and structure of fungi
LO 4	Understand the general features and characters of parasites
LO 5	Understand the structure, and general characters of Eubacteria and Archaebacteria based on cultural and biochemical characteristic features.

Unit I: Viral Classification and Cultivation Techniques

Casjens and Kings classification. Isolation, purification and cultivation of viruses. General features of Plant virus (Cauliflower mosaic virus), Animal virus (Measles virus) and bacteriophages - lytic and lysogenic phages (T4 and lambda phages).

Unit II: Classification and Economic Importance of Algae

FRITCH classification. General characters and structure of Cyanobacteria (*Nostoc*), Rhodophyta (*Gracilaria*), Euglenophyta (*Euglena*), Chrysophyta (*Diatom*), Phaeophyta (*Sargassum wightii*), and Unicellular (*Chlorella*). Economic importance of algae.

Unit III:Classification and Economic Importance of Fungi

Alexopoulos classification. General features and reproduction of filamentous fungi (Actinomycetes), molds (*Aspergillus*), macroscopic fungi

(mushroom-*Agaricus bisporus*)– unicellular fungi (Yeast-*Saccharomyces cerevisiae*). Economic importance of fungi.

Unit IV:Characteristics and Classification of Parasites

Distinguishing characters, structure and classification, life cycle for the following: *Entamoeba* sp, *Leishmania* sp, Helminthes: cestodes (*Taenia solium*), Nematodes (*Ascaris lumbricoides*)

Unit V: Classification and Characteristics of Bacteria

Bergey's Classification. Eubacteria: Cultural and Biochemical characters of aerobic Gram positive (cocci – *Streptococcus* sp, rod –*Bacillus* sp), Gram negative (cocci –*Neisseria* sp, rod –*Pseudomonas* sp). Anaerobic Gram positive (Cocci- *Peptostreptococcus* sp, rod –*Clostridium* sp), Gram negative (Cocci –*Veillonella*sp, Rod –*Bacteriodes* sp). Facultative – *Escherichia coli*.

TEXT BOOKS

1 Dubey, R.C. and Maheswari, S.A Text Book of Microbiology. S. Chand and Co, New Delhi. 2003.
2 Kanika, S. Textbook of Microbiology–Tools and Techniques. (1st edn), Ane Books Pvt. Ltd, New Delhi. 2011.
3 Pelczar, M.J.*et al.*, Microbiology. McGraw- Hill Inc New York. 1993.
4 Power CB, Dagina Wala. General Microbiology Volume II, Himalaya Publishing House, Delhi. 2010.
5 Power CB, Dagina Wala. General Microbiology Volume I, Himalaya Publishing House, Delhi. 2010.

REFERENCES BOOKS

1 Atlas, R. Principles of Microbiology (2nd ed), Wm.C. Brown publishers.1997.
2 Prescott, L. M.et al., Microbiology. 9th edition. McGraw- Hill Inc, New York. 2013.
3 Salle, A.J.Fundamental Principles of Bacteriology. (7th edn), Tata McGraw-HillPublications Ltd. 1984.
4 Oarsman S.N.J., *etal.*Virology Illustrated colour text, 1st ed. Elsevier Health Sciences. 2012.
5 Stanier, Y.et al., General Microbiology. MacMillan Press LTD, Houndmills, Basingstoke, Hampshire, London. 1999

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Order viruses depending on the ability to infect different living forms.	1,3,5	K2
CO 2	Classify algae based on the characters, structures and features.	1, 3,4, 5	K3
CO 3	Classify fungi based on the characters, structures and features.	1, 3,5	K4
CO 4	Predict the parasitic diseases and adopt preventive measures.	1, 3,4, 5	K4
CO 5	Summarize the structure, taxonomic order and classification of Eubacteria and Archaebacteria	1, 3,5	K3

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course					Hours		Credits		
I	24UFMB11	BASICS IN MICROBIOLOGY					30		2		
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO1	PSO 2	PSO3	PSO 4	PSO5
CO – 1	3	2	3	2	3		3	3	2	2	3
CO – 2	3	2	3	2	3		3	3	2	2	3
CO – 3	3	2	3	2	3		3	3	2	2	3
CO – 4	3	2	3	2	3		3	3	2	2	3
CO – 5	3	2	3	2	3		3	3	2	2	3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.P.Jeya Sheela

Checked by: Dr.R.Janet Rani
Head of the Department

Semester – II	GRAMMAR		24ULAR21			
LANG – I			L	T	P	C
Hrs./Week: 6	Hrs./Semester : 90	Marks :100	6	-	-	3

General Objective: To make the students to develop the skill of basic Arabic Grammar and Translation skills from Arabic to English vice-versa.

Learning Objectives

LO	The learners will be able to:
LO 1	Understand basic Arabic grammar.
LO 2	Understand the correct usage of Arabic grammar.
LO 3	Employ sentence making.
LO 4	Enhance vocabulary.
LO 5	Improve reading and writing skills.

UNIT I - Lessons 1 to 4 (Text Book – 1) من الدرس الأول إلى الدرس الرابع

UNIT II - Lessons 5 to 8 (Text Book – 1) من الدرس الخامس إلى الدرس الثامن

UNIT III – Lessons 9 to 12 (Text Book – 1) من الدرس التاسع إلى الدرس الثاني عشر

UNIT IV – Lessons 13 to 16 (Text Book – 1) من الدرس الثالث عشر إلى الدرس السادس عشر

UNIT V – Lessons 17 to 20 (Text Book – 1) من الدرس السابع عشر إلى الدرس العشرون

Textbooks:

1. قواعد اللغة العربية الأساسية، الدكتور سيد رحمة الله، رئيس سابق لقسم اللغة العربية، الكلية الجديدة، شنائي

Basic Arabic Grammar, By Dr. Syed Rahmathullah

Reference Books:

النحو الواضح – علي الجارم ومصطفى أمين
دليل النحو الواضح – الدكتور بشير أحمد جمالي
سهل العوامل _ الدكتور تاج الدين المناني
النحو الميسر للكبار والصغار – علي محمود عقيلي
القواعد التطبيقية في اللغة العربية – الدكتور نديم دعكور

www.alnahw.com

Course Outcomes

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO-1	Able to use basic grammatical structure.	PSO-1,2,4	K2
CO-2	Develop reading skills and reading speed	PSO-1,2	K2
CO-3	Acquire new vocabulary in Arabic	PSO-1,2,3	K3
CO-4	Understand the different types of sentences.	PSO-1,2,3	K4
CO-5	Able to construct simple sentences in Arabic	PSO-1,2,5	K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
II	24ULAR21	GRAMMAR	90	3

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	3	2	2	2	2	2	3	2	2	2	1
CO-2	2	2	2	3	1	3	2	2	2	3	1
CO-3	3	3	3	2	2	1	3	3	3	2	2
CO-4	3	3	2	3	3	2	3	3	2	3	3
CO-5	2	2	1	2	3	2	2	2	1	2	3

STRONG – 3, MEDIUM – 2 , LOW – 1

Prepared by : Dr. J. Ubaiyathulla

Checked by: Dr. J. Ubaiyathulla
Head of the Department

Semester - II	பொதுத்தமிழ் - 2		24ULTA21			
LANG – I	தமிழ் இலக்கிய வரலாறு - 2		L	T	P	C
Hrs./Week: 6	Hrs./Semester : 90	Marks :100	6	-	-	3

General Objective:

- தமிழ் இலக்கியப் போக்குகளையும் இலக்கணங்களையும் மாணவர் .
- அறியுமாறு செய்து அவர்களின் படைப்பாற்றலைத் தூண்டுதல்
- தமிழ் இலக்கியம் சார்ந்த போட்டித் தேர்வுகளுக்கு ஏற்ப கற்பித்தல்.
- நடைமுறைகளை மேற்கொள்ளுதல்

Learning Objectives:

LO	The Learners will be able to:
LO - 1	சிற்றிலக்கியங்களின் வழி இலக்கியச் சுவையினையும் பண்பாட்டு அறிவினையும் பெறுதல்
LO - 2	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்
LO - 3	திராவிட இயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழி உணர்வு , இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனைகளை ஊட்டுதல்
LO - 4	தமிழ்மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச்சொற்களை உருவாக்கவும் அறிந்து கொள்ளுதல்
LO - 5	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ்ப் பாடத்தினைப் பயன்கொள்ளும் வகையில் மேடைப்பேச்சு மற்றும் கட்டுரை, கதை எழுதுவதற்கு பயிற்சி பெறுதல்.

அலகு 1 தமிழ் இலக்கிய வரலாறு அறிமுகம்

1. சிற்றிலக்கியம் குறவஞ்சி, கலம்பகம், உலா, பரணி, பள்ளு, பிள்ளைத்தமிழ், தூது, அந்தாதி.
2. தனிப்பாடல் அறிமுகம்.
3. இக்கால இலக்கியம், கவிதை, சிறுகதை, நாடகம், உரைநடை , திராவிட இயக்கம் வளர்த்த தமிழ்

அலகு 2 சிற்றிலக்கியமும் தனிப்பாடலும்

சிற்றிலக்கியம்

1. கலிங்கத்துப் பரணி- விருந்தினரும் வறியவரு நெருங்கி யுண்ணரும் - முதல் - கேட்பாரைக் காண்மின் காண்மின் வரை.
2. திருக்குற்றாலக் குறவஞ்சி - வானரங்கள் கனிகொடுத்து.
3. முக்கூடற் பள்ளு - ஆற்று வெள்ளம் நாளை வரத்.
4. அபிராமி அந்தாதி- கலையாத கல்வியும் குறையாத வயதும் (பதினாறு செல்வங்கள்).
5. திருவரங்கக் கலம்பகம் – மறம் -பிள்ளைப் பெருமாள் ஐயங்கார்- பேசவந்த தூத செல்லரித்த ஓலை செல்லுமோ.

6. தமிழ்விடு தூது முதல் பத்து கண்ணிகள்

தனிப்பாடல்

1. வான்குருவியின் கூடு - ஔவையார்
2. ஆமணக்குக்கும் யானைக்கும் சிலேடை - முத்திருக்கும் கொம்பசைக்கும் மூரித்தண்டே - காளமேகப் புலவர்
3. இம்பர் வான் எல்லை இராமனையே பாடி - வீரராகவர்
4. நாராய் நாராய் - சத்தி முத்தப் புலவர்

அலகு 3 இக்கால இலக்கியம் - 1

1. பாரதியார் - பாரத சமுதாயம் வாழ்கவே
2. பாரதிதாசன் - சிறுத்தையே வெளியில் வா
3. நாமக்கல் கவிஞர்- கத்தியின்றி
4. தமிழ் ஒளி – மீன்கள் (அந்தி நிலா பார்க்க வா)
5. ஈரோடு தமிழன்பன் – எட்டாவது சீர் (வணக்கம் வள்ளுவ)

சிறுகதைகள்

1. புதுமைப்பித்தன் - கடிதம்
2. ஜெயகாந்தன் - வாய்ச் சொற்கள் (மாலை மயக்கம் - தொகுப்பு)
3. ஆர். சூடாமணி - அந்நியர்கள்

உரைநடை

1. மு வ கடிதங்கள் - தம்பிக்கு நூலில் முதல் இரண்டு கடிதங்கள்

அலகு 4 இக்கால இலக்கியம் - 2

1. தந்தை பெரியார் – திருக்குறள்(மாநாட்டு) உரை
2. பேரறிஞர் அண்ணா – இரண்டாம் உலகத் தமிழ் மாநாட்டு உரை
3. கலைஞர் மு. கருணாநிதி – தொல்காப்பிய பூங்கா –எழுத்து -முதல் நூற்பா கட்டுரை

நாடகம் - திரைத்தமிழ்

1. வேலைக்காரி –திரைப்படம்
2. ராஜா ராணி -சாக்ரடீஸ் -ஓரங்க நாடகம்

இதழியல் தமிழ்:

முரசொலி கடிதம்

1. செம்மொழி வரலாற்றில் சில செப்பேடுகள்

அலகு 5 மொழிப் பயிற்சி

சொல் வேறுபாடு / பிழை தவிர்த்தல்

ரகர – றகர வேறுபாடுகள்

நகர – ணகர – னகர வேறுபாடுகள்

லகர – ளகர – ழகர வேறுபாடுகள்

பாட நூல்:

பதிப்பாசிரியர் முனைவர் ச.மகாதேவன், பொதுத்தமிழ் 2,
சதக்கத்துல்லாஹ் அப்பா கல்லூரி வெளியீடு 2024 – 2025(முதற் பதிப்பு).

பார்வை நூல்கள் :

1. மு. வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்ய அகாதெமி, புதுடெல்லி.
2. மது. ச. விமலானந்தன், தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
3. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை.
4. தமிழ் இலக்கிய வரலாறு – முனைவர்.சிற்பி பாலசுப்ரமணியம், முனைவர்.சொ.சேதுபதி
5. புதிய தமிழ் இலக்கிய வரலாறு – முனைவர்.சிற்பி பாலசுப்ரமணியம், நீல.பத்மநாபன்
6. தமிழ் இலக்கிய வரலாறு - டாக்டர்.அ.கா.பெருமாள்
7. தமிழ் இலக்கிய வரலாறு - முனைவர். ப.ச.ஏசுதாசன்
8. தமிழ் இலக்கிய வரலாறு – ஸ்ரீகுமார்
9. வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு – பாக்கியமேரி.
10. தமிழ் பயிற்றும் முறை, பேராசிரியர் ந. சுப்புரெட்டியார் - மணிவாசகர் பதிப்பகம், சிதம்பரம்

- https://www.chennailibrary.com/
- https://www.sirukathaigal.com
- https://www.tamilvirtualuniversity.org
- https://www.noolulagam.com
- https://www.katuraitamilblogspot.com

Course Outcomes

CO	Upon completion of this course, students will be able to	PSO Addressed	Cognitive Level
CO-1	சிற்றிலக்கியங்களின்வழி இலக்கியச் சுவையினையும் பண்பாட்டு அறிவினையும் பெறுவர்	2,4	K2, K3
CO-2	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்	1,4	K2
CO-3	திராவிட இயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழி உணர்வு, இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனைகளைப் பெறுவர்	2,4,5	K4,K5
CO-4	தமிழ்மொழியைப் பிழையின்றி எழுதவும், புதிய கலைச்சொற்களை உருவாக்கவும் அறிந்து கொள்வர்	1,3	K3,K6
CO-5	போட்டித் தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ்ப் பாடத்தினைப் பயன்கொள்ளும் வகையில் மேடைப்பேச்சு மற்றும் கட்டுரை, கதை எழுதுவதற்கு பயிற்சி பெறுவர் பயிற்சி பெறுவர்.	1,2,3,4	K4, K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
II	24ULTA21	தமிழ் இலக்கிய வரலாறு - 2	90	3

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	2	3	3	3	2	2	2	3	2	3
CO-2	3	3	2	2	2	3	2	3	3	2	2
CO-3	3	2	3	3	2	2	2	3	2	3	3
CO-4	3	3	3	2	2	2	3	2	3	2	2
CO-5	3	3	2	2	2	3	3	2	2	2	2

3 - STRONG, 2 - MEDIUM, 1- LOW

Prepared by : Dr. A.S. Shaik Sindha

Checked by: Dr.S.Mahadevan
Head of the Department

Semester - II	General English-II		24ULEN21			
LANG – II			L	T	P	C
Hrs./Week: 6	Hrs./Semester : 90	Marks :100	6	-	-	3

General Objective:

To teach the four skills viz. Listening, Speaking, Reading and Writing to train the students the skills necessary for social and academic interactions.

Learning Objectives (LO)

LO	The learners will be able to:
LO-1	To make students realize the importance of resilience
LO-2	To enable them to become good decision makers
LO-3	To enable them to develop problem-solving skills
LO-4	To enable them to use tenses appropriately
LO-5	To help them use English effectively at workplace.

Unit – I

The Skill Focussed: Resilience

Poetry

1. "Don't Quit" – Edgar A. Guest
2. "Still Here" – Langston Hughes

Short Story

3 Engine Trouble – R.K. Narayan

4 Rip Van Winkle – Washington Irving

Unit – II

The Skill Focussed: Decision Making

Short Story

1. The Scribe – Kristin Hunter
2. The Lady or the Tiger - Frank Stockton

Poetry

3. "The Road not Taken" – Robert Frost
4. "Snake" – D. H Lawrence

Unit – III

The Skill Focussed: Problem Solving

Autobiography

1. How I taught My Grandmother to Read – Sudha Murthy
2. How Frog Went to Heaven – A Tale of Angolo
3. Wings of Fire (Chapters 1,2,3) by A.P.J Abdul Kalam

Unit – IV

Grammar

Tenses

1. Present
2. Past
3. Future
4. Concord

Unit - V

English in the Workplace

1.e-mail – Invitation, Enquiry, Seeking Clarification

2. Circular
3. Memo
4. Minutes of the Meeting

Textbook:

1. Board of Editors. General English – II. Tamil Nadu State Council for Higher Education (TANSCHE). Chennai: 2024.

Reference Books:

1. Martin Hewings, *Advanced English Grammar*, Cambridge University Press, 2000.
2. SP Bakshi, Richa Sharma, *Descriptive English,* Arihant Publications (India) Ltd., 2019.
3. Sheena Cameron, Louise Dempsey, *The Reading Book: A Complete Guide to Teaching Reading*, S&L. Publishing, 2019.
4. Barbara Sherman, *Skimming and Scanning Techniques*, Liberty University Press, 2014.
5. Shaikh Moula, *Communication Skills: A Practical Approached*.
6. Ramendra Kumar, *Stories of Resilience*, Blue Rose Publications, 2020.

Course Outcomes

CO	Upon completion of this course, students will be able to	PSO Addressed	Cognitive Level
CO-1	Understand the importance of resilience	1, 2, 4	K1, K2
CO-2	Acquire knowledge to make good decisions	1, 2, 3, 4	K2, K3
CO-3	Develop problem-solving skills	1, 2, 3, 4	K3, K4
CO-4	Evaluate the uses of tenses in English	1, 2, 3	K4, K5
CO-5	Use English effectively at the workplace.	2, 4, 5	K5, K6

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

Relationship Matrix

Semester	Course Code			Title of the Course			Hours		Credits		
II	24ULEN21			General English - II			90		3		
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	3	3	1	3	1		1	3	3	3	1
CO-2	3	3	3	3	2		3	3	3	3	2
CO-3	3	3	3	3	1		3	3	3	3	1
CO-4	3	3	3	2	1		3	3	3	1	2
CO-5	1	3	2	3	3		3	3	3	3	3
	STRONG – 3, MEDIUM – 2 , LOW – 1										

Prepared by : Dr.L.Faustina Leo Checked by: Dr. S. Mohamed Haneef

Head of the Department

Semester - II	MICROBIAL PHYSIOLOGY AND METABOLISM		24UCMB21			
Core-II			L	T	P	C
Hrs./Week: 5	Hrs./Semester : 75	Marks :100	5	-	-	5

General Objective:

Understanding Microbial Physiology and Metabolism: Exploring the physiological processes and metabolic pathways of microorganisms.

LEARNING OBJECTIVES

LO	The learners will able to:
LO 1	Study the basic principles of microbial growth.
LO 2	Understand the basic concepts of aerobic and anaerobic metabolic pathways.
LO 3	Analyze the role of individual components in overall cell function.
LO 4	Provide information on sources of energy and its utilization by microorganisms.
LO 5	Study the different types of metabolic strategies.

Unit I:Understanding Microbial Growth Dynamics and Control

Physiology of microbial growth: Batch – continuous - synchronous cultures; Growth Curve and measurement method (turbidity, biomass, and cell count). Control of microbial growth

Unit II:Microbial Nutrition and Growth Factors

Nutrition requirements - Photoautotrophs, Photoorganotrophs, Chemolithotrophs (Ammonia, Nitrite, Sulfur, Hydrogen, Iron oxidizing Bacteria), Chemoorganotrophs. Nutrition transport mechanisms – Passive diffusion and Active transport. Factors affecting microbial growth

Unit III:Microbial Metabolism: Pathways and Fermentation

An overview of Metabolism - Embden Meyerhof Pathway, Entner-Doudoroff Pathway, Pentose Phosphate Pathway, Tricarboxylic Acid Cycle. Electron Transport Chain and Oxidative Phosphorylation. ATP synthesis. Fermentation-Homolactic Fermentation, Heterolactic Fermentation, Mixed Acid Fermentation, Butanediol Fermentation

Unit IV:Photosynthesis: Chloroplast Structure and Light Reactions

Photosynthesis - An Overview of chloroplast structure. Photosynthetic Pigments, Light Reaction-Cyclic and non-cyclic Photophosphorylation. Dark Reaction - Calvin Cycle

Unit V:Bacterial, Fungal, Microalgal and Protozoal Reproduction

Bacterial reproduction - Binary fission, Budding, Reproduction through conidia, cyst formation, endospore formation. Fungi asexual and sexual reproduction, Microalgae reproduction. Asexual and sexual reproduction of protozoa.

TEXT BOOKS

1. Schlegal, H.G. (1993). General Microbiology., 7th Edition, Press syndicate of the University of Cambridge.
2. RajapandianK.(2010). Microbial Physiology, Chennai: PBS Book Enterprises India.
3. MeenaKumari. S. Microbial Physiology, Chennai 1st Edition MJP Publishers 2006.
4. Dubey R.C. and Maheswari, S. (2003). A textbook of Microbiology, New Delhi: S.Chand& Co.
5. S. Ram Reddy, S.M. Reddy (2008). Microbial Physiology. Anmol Publications Pvt Ltd.

REFERENCES BOOKS

1. Robert K. Poole (2004). Advances in Microbial Physiology, Elsevier Academic Press, New York, Volume 49.
2. Kim B.H., Gadd G.M. (2008). Bacterial Physiology and Metabolism. Cambridge University Press, Cambridge.
3. Daniel R. Caldwell. (1995). Microbial Physiology & Metabolism Wm.C. Brown Communications, Inc. USA.
4. Moat, A.G and J.W Foaster (1995). Microbial Physiology, 3rd edition. Wiley – LISS, A John Wiley & Sons. Inc. Publications.
5. BhanuShrivastava. (2011). Microbial Physiology and Metabolism: Study of Microbial Physiology and Metabolism. Lambert academic Publication.

WEB RESOURCES

1. https://sites.google.com/site/microbial physiologyoddsem/teaching-contents
2. https://courses.lumenlearning.com/boundless-microbiology/chapter/microbial-Nutrition
3. https://onlinecourses.swayam2.ac.in/cec20_bt14/preview
4. http://web.iitd.ac.in/~amittal/2007_Addy_Enzymes_Chapter.pdf
5. https://www..frontiersin.org.microbial-physiology-and-metabolism

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Describe microorganisms based on nutrition.	1,2,3,5	K2
CO 2	Know the concept of microbial growth and identify the factors affecting bacterial growth.	1,2,3,5	K2 & K4
CO 3	Explain the methods of nutrient uptake.	1,2,3,5	K2
CO 4	Describe anaerobic and aerobic energy production.	1,2,3,5	K2
CO 5	Elaborate on the process of bacterial photosynthesis and reproduction.	1,2,3,5	K2

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing;

K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
II	**24UCMB21**	**MICROBIAL PHYSIOLOGY AND METABOLISM**	**75**	**5**

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PSO1**	**PSO 2**	**PSO3**	**PSO 4**	**PSO5**
CO – 1	3	3	3	2	3		3	3	3	2	3
CO – 2	3	3	3	2	3		3	3	3	2	3
CO – 3	3	3	3	2	3		3	3	3	2	3
CO – 4	3	3	3	2	3		3	3	3	2	3
CO – 5	3	3	3	2	3		3	3	3	2	3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.P.Jeya Sheela

Checked by: Dr.R.Janet Rani

Head of the Department

Semester - II	TECHNIQUES IN MICROBIAL PHYSIOLOGY AND METABOLISM		24UCMB2P			
Core-IIP			L	T	P	C
Hrs./Week: 3	Hrs./Semester : 45	Marks :100	-	-	3	3

General Objective:

To understand and apply methods for studying microbial growth, metabolism and nutritional requirements.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Understand the principles of motility test.
LO – 2	Understand the basic concepts of staining methods.
LO – 3	Learn the bacterial count using different methods and anaerobic culture.
LO – 4	Study the morphological demonstration of microorganisms and identification.
LO – 5	Study the biochemical identification of the bacteria.

Course Outline:

1. Motility demonstration: hanging drop & wet mount preparation, semi-solid agar, Craigie's tube method.
2. Staining techniques: Smear preparation, permanent specimen preparation,
3. Capsular staining and
4. Acid-fast staining
5. Direct counts – Direct cell count (Petroff-Hausser counting chamber), Turbidometry.
6. Viable count - pour plate & spread plate.
7. Bacterial growth curve
8. Anaerobic culture methods.
9. Antibiotic sensitivity testing: Disc diffusion test- quality control with standard strains
10. Morphological variations in algae, fungi and protozoa.
11. Micrometry: Demonstration of the size of yeast, fungal filaments and protozoa
12. Methods of bacterial identification- morphological, physiological, and biochemical methods - IMViC test, H_2S, TSI, Oxidase, Catalase, Urease test, and Carbohydrate fermentation test.
13. Maintenance of pure culture, paraffin method and stab culture.
14. Maintenance of mold culture.

TEXT BOOKS

1 James G Cappucino and N. Sherman MB (1996). A lab manual Benjamin Cummins, New York.

2 Kannan. N (1996).Laboratory manual in General Microbiology. Palani Publications.
3 Sundararaj T (2005). Microbiology Lab Manual (1st edition) publications.
4 Gunasekaran. P (2007). Laboratory manual in Microbiology. New age international publisher.
5 Elsa Cooper (2018). Microbial Physiology: A Practical Approach. Callisto Reference publisher.

REFERENCES BOOKS

1 David White., James Drummond., Clay Fuqua (2012) Physiology and Biochemistry of Prokaryotes. 4th Ed. Oxford University Press, New York.
2 Robert K. Poole (2004). Advances in Microbial Physiology, Elsevier Academic Press, New York, Volume 49.
3 Kim B.H., Gadd G.M. (2008). Bacterial Physiology and Metabolism. Cambridge University Press, Cambridge.
4 Dawes, I.W and Sutherland L.W (1992). Microbial Physiology (2nd edition), Oxford Blackwell Scientific Publications.
5 Moat, A.G and J.W Foaster, (1995). Microbial Physiology, 3rd edition. Wiley – LISS, A John Wiley & Sons. Inc. Publications.

WEB RESOURCES

1 https://sites.google.com/site/microbial physiologyoddsem/teaching-contents
2 https://courses.lumenlearning.com/boundless-microbiology/chapter/microbial-Nutrition
3 https://onlinecourses.swayam2.ac.in/cec20_bt14/preview
4 https://www.studocu.com/microbial-physiology-practicals
5 https://www.agr.hokudai.ac.jp/microbial-physiology

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Describe hanging drop, wet mount preparation, semi-solid agar, Craigie's tube method.	1,2,3,4,5	K2
CO 2	Demonstrate Smear preparation, permanent specimen preparation, Capsular, and Acid-fast staining.	1,2,3,4,5	K3
CO 3	Explain antibiotic sensitivity testing: Disc diffusion test- quality control with standard strains.	1,2,3,4,5	K2
CO 4	Describe demonstration of the size of yeast, fungal filaments and protozoa.	1,2,3,4,5	K2
CO 5	Elaborate on the bacterial identification-morphological, physiological, and biochemical methods.	1,2,3,4,5	K2

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing;

K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course					Hours				Credits
II	24UCMB2P	TECHNIQUES IN MICROBIAL PHYSIOLOGY AND METABOLISM					45				3
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO1	PSO 2	PSO3	PSO 4	PSO5
CO – 1	3	3	3	3	3		3	2	3	2	2
CO – 2	3	3	3	3	3		3	2	3	2	2
CO – 3	3	3	3	3	3		3	2	3	2	2
CO – 4	3	3	3	3	3		3	2	3	2	2
CO – 5	3	3	3	3	3		3	2	3	2	2
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.P.Jeya Sheela

Checked by: Dr.R.Janet Rani

Head of the Department

Semester - II	BIOINSTRUMENTATION		24UAMB21			
EC-II (Allied)			L	T	P	C
Hrs./Week: 4	Hrs./Semester : 60	Marks :100	4	-	-	4

General Objective: Understand the principles, operation and applications of key bioinstrumentation techniques.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Understand the analytical instruments and study the basic principles in the field of sciences.
LO – 2	To gain knowledge about principles of spectroscopy
LO – 3	Understand the analytical techniques of Chromatography and electrophoresis
LO – 4	To understand the principle of different types of scans used in medical diagnosis
LO – 5	To gain information about the principles of radioactivity and its measurements

UNIT: I - Basic bioinstrumentation and biochemical calculations

Basic instruments: pH meter, Buffer of biological importance, Centrifuge-Preparative, Analytical and Ultra, Laminar Air Flow, Autoclave**,** Hot Air Oven and Incubator. Biochemical calculations-preparations of Molar solutions - Buffers- Phosphate, Acetate, TE, TAE - calculation of Normality, PPM-Ammonium sulphate precipitation.

UNIT: II - Spectroscopic techniques in biochemistry

Spectroscopic Techniques: Spectroscopic Techniques: Colorimeter, Ultraviolet and visible, Infra red and Mass Spectroscopy.

UNIT: III - Chromatography and Electrophoresis techniques

Chromatographic and Electrophoresis Techniques: Chromatographic Techniques: Paper, Thin Layer, Column, HPLC and GC. Electrophoresis Techniques: Starch Gel, AGE, PAGE.

UNIT: IV - Imaging techniques

Imaging techniques: Principle, Instrumentation and application of ECG, EEG, EMG, MRI, CT and PET scan radioisotopes.

UNIT: V - Fluorescence and radiation techniques

Fluorescence and radiation based techniques: Spectrofluorimeter, Flame photometer, Scintillation counter, Geiger Muller counter, Autoradiography.

Text Books

1. Jayaraman J (2011). Laboratory Manual in Biochemistry, 2nd Edition. Wiley Eastern Ltd., New Delhi.
2. Ponmurugan. P and Gangathara PB (2012). Biotechniques.1stEdition. MJP publishers.
3. Veerakumari, L (2009).Bioinstrumentation- 5 th Edition -.MJP publishers.
4. Upadhyay, Upadhyay and Nath (2002). Biophysical chemistry – Principles and techniques 3rd Edition. Himalaya publishing home.
5. Chatwal G and Anand (1989). Instrumental Methods of Chemical Analysis. S.Himalaya Publishing House, Mumbai.

References Books

1. Rodney.F.Boyer (2000). Modern Experimental Biochemistry, 3rd Edition. Pearson Publication.
2. SkoogA. WestM (2014). Principles of Instrumental Analysis – 14th Edition W.B.SaundersCo., Philadephia.
3. N.Gurumani. (2006). Research Methodology for biological sciences- 1st Edition – MJP Publishers.
4. Wilson K and Walker J (2010). Principles and Techniques of Biochemistry and Molecular Biology.7thEdition. Cambridge University Press.
5. Webster, J.G. (2004). Bioinstrumentation- 4th Edition - John Wiley & Sons (Asia) Pvt.Ltd, Singapore.

Web Resources

1. http://www.biologydiscussion.com/biochemistry/centrifugation/centrifugeintroduction-types- uses-and-other-details-with-diagram/12489
2. https://www.watelectrical.com/biosensors-types-its-working-andapplications/
3. http://www.wikiscales.com/articles/electronic-analytical-balance/ Page 24 of 75
4. https://study.com/academy/lesson/what-is-chromatography-definition-typesuses.html
5. http://www.rsc.org/learn-chemistry/collections/spectroscopy/introduction

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO – 1	Gain knowledge about the basics of instrumentation.	1,2,5	K1
CO – 2	Exemplify the structure of atoms and molecules by using the principles of spectroscopy.	1,2,5	K2
CO – 3	Evaluate by separating and purifying the components.	1,2,5	K5
CO – 4	Understand the need and applications of imaging techniques.	1,2,5	K2
CO – 5	Categorize the working principle and applications of fluorescence and radiation.	1,2,5	K4

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code			Title of the Course			Hours			Credits
II	24UAMB21			BIOINSTRUMENTATION			60			4
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)			
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO – 1	3	3	-	-	3	-	3	2	2	-	3
CO – 2	3	3	-	-	3	-	-	2	2	-	3
CO – 3	3	3	-	-	3	-	-	2	3	-	3
CO – 4	3	3	-	-	3	-	3	1	3	-	3
CO – 5	3	3	-	-	3	-	3	3	3	-	3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.S.Meenakshi

Checked by: Dr.R.Janet Rani

Head of the Department

Semester - II	TECHNIQUES IN BIOINSTRUMENTATION		24UAMB2P			
EC-IIP (Allied)			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	-	-	2	1

General objective: To introduce students to various techniques and instruments used in bioinstrumentation for biomedical research and analysis.

LEARNING OBJECTIVES

LO	The learners will able to:
LO 1	Acquire knowledge on preparation of solution in different concentration and pH determination of solution
LO 2	Gain knowledge to operate instruments.
LO 3	Learn the chromatography technique to separate compounds
LO 4	Learn the technique for the extraction process.
LO 5	Acquire knowledge on protein, DNA separation techniques

1. Determination of pH of the solution using pH meter, Preparation of 1 Molarity and 1 Normality concentration solution.
2. Verification of Beer- Lambert's Law using Spectrophotometer. Autoclave- Thermostability. Centrifuge- Serum/Plasma separation.
3. Separation of amino acid using paper chromatography, Thin layer Chromatography
4. Extraction of Plant compounds using soxhlet apparatus
5. High performance liquid chromatography (Demonstration), Separation of Protein using SDS-PAGE (Demonstration)

Text Books

1 James G Cappucino and N. Sherman MB (1996). A lab manual Benjamin Cummins, New York 1996.

2 Kannan. N (1996). Laboratory manual in General Microbiology. Palani Publications.

3 Sundararaj T (2005). Microbiology Lab Manual (1st edition) publications.

4 Gunasekaran, P. (1996). Laboratory manual in Microbiology. New Age International Ld., Publishers, New Delhi.

5 R C Dubey and D K Maheswari (2002). Practical Microbiology. S. Chand Publishing.

References Books

1 Atlas.R (1997). Principles of Microbiology, 2nd Edition, Wm.C.Brown publishers.

2 Amita J, Jyotsna A and Vimala V (2018). Microbiology Practical Manual. (1st Edition). Elsevier India

3 Talib VH (2019). Handbook Medical Laboratory Technology. (2nd Edition). CBS

4 Wheelis M, (2010). Principles of Modern Microbiology, 1st Edition. Jones and Bartlett Publication.
5 Lim D. (1998). Microbiology, 2nd Edition, WCB McGraw Hill Publications.

Web Resources

1 http://www.biologydiscussion.com/micro-biology/sterilisation-and-disinfection-methods-and-principles-microbiology/24403.
2 https://www.ebooks.cambridge.org/ebook.jsf?bid=CBO9781139170635
3 https://www.grsmu.by/files/file/university/cafedry//files/essential_microbiology.pdf
4 https://microbiologyinfo.com/top-and-best-microbiology-books/
5 https://www.cliffsnotes.com/studyguides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Acquire knowledge on preparation of solution in different concentration and pH determination of solution	1,2,5	K1
CO 2	Gain knowledge to operate instruments.	1,2,5	K2
CO 3	Learn the chromatography technique to separate compounds	1,2,5	K3
CO 4	Learn the technique for the extraction process.	1,2,5	K3
CO 5	Acquire knowledge on protein, DNA separation techniques	1,2,5	K2

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing; K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course					Hours				Credit
II	**24UAMB2P**	**TECHNIQUES IN BIOINSTRUMENTS**					**30**				**1**
Course Outcomes (COs)	**Programme Outcomes (POs)**						**Programme Specific Outcomes (PSOs)**				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO – 1	2	3			3			3	3		3
CO – 2	2	3			3			3	3		3
CO – 3	3	3			3			3	3		3
CO – 4	3	3			3			3	3		3
CO – 5	3	3			3			3	3		3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.S.Meenakshi

Checked by: Dr.R.Janet Rani
Head of the Department

Semester - II	NUTRITION AND HEALTH HYGIENE		24UNMB21			
SEC-II (NME)			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

General Objective:

To educate students about the principles of nutrition and health hygiene to promote overall well-being and prevent diseases.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Learn about nutrition and their importance
LO – 2	Make student understand thenutritional facts fora better life.
LO – 3	Learn information to optimize our diet
LO – 4	Impart knowledge on different health care programs taken up by India
LO – 5	Learn knowledge on different health indicators and types of hygiene methods

Unit I: Essentials of Nutrition and Health

Nutrition – definition, importance, Good nutrition, and mal nutrition; Balanced Diet: Basics of Meal Planning. Carbohydrates, Lipids, Proteins and Vitamins –functions, dietary sources, effects of deficiency. Macro and micro minerals –functions, effects of deficiency; food sources of Calcium, Potassium, and Sodium; food sources of Iron, Iodine, and Zinc. Importance of water– functions, sources, requirements and effects of deficiency

Unit II: Nutrition Across the Life Cycle

Nutrition for Life Cycle: Balanced diet - Normal, Pregnant, lactating women, Infancy, young children Adolescents, Adults, and the Elderly; Diet Chart; Nutritive value of Indian foods

Unit III: Understanding Nutritional Disorders

Improper diets: Definition, Identification, Signs and Symptoms - malnutrition, under-nutrition, over-nutrition, Protein Energy Malnutrition, obesity; Nutritional Disease and Disorder - hypertension, diabetes, anemia, Osteomalacia, cardiovascular disease

Unit IV: Health and Nutrition Fundamentals

Health - Determinants of health, Key Health Indicators, Environment health & Public health; Health-Education: Principles and Strategies. Health Policy & Health Organizations: Health Indicators and National Health Policy of Govt. of India; Functioning of various nutrition and health organizations in India

Unit V: Hygiene and Community Health Essentials

Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (Water, Sanitation and Hygiene) programme. Rural Community Health: Village health sanitation & Nutritional committee. Community & Personal Hygiene: Environmental Sanitation and Sanitation in Public places

TEXTBOOKS

1. Bamji, M.S., K. Krishnaswamy & G.N.V. Brahmam (2009) Textbook of Human Nutrition(3rd edition) Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Swaminathan (1995) Food & Nutrition (Vol I, Second Edition) The Bangalore Printing &Publishing Co Ltd., , Bangalore
3. SK. Haldar (2022). Occupational Health and Hygiene in Industry. CBS Publishers.
4. Acharya, Sankar Kr, Rama Das, Minati Sen (2021). Health Hygiene and Nutrition Perception and Practices. Satish Serial Publishing House.
5. Dass (2021).Public Health and Hygiene, Notion Press

REFERENCES BOOKS

1. VijayaKhader (2000)Food, nutrition & health, Kalyan Publishers, New Delhi
2. Srilakshmi, B., (2010)Food Science, (5th Edition) New Age International Ltd., New Delhi
3. Arvind Kumar Goel (2005). A College Textbook of Health &Hygiene,ABD Publishers
4. Sharma D. (2015).Textbook on Food Science and Human Nutrition. Daya Publishing House.
5. Revilla M. K. F., Titchenal A. and Draper J. (2020). Human Nutrition. University of Hawaii, Mānoa.

WEB RESOURCES

1. National Rural Health Scheme: https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=969&lid=49
2. National Urban Health Scheme: https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=970&lid=137
3. Village health sanitation & Nutritional committee https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=149&lid=225
4. Health Impact Assessment - https://www.who.int/hia/about/faq/en/
5. Healthy Living https://www.nhp.gov.in/healthylivingViewall

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Learn the importance of nutrition for a healthy life	1, 3, 5	K2
CO 2	Study the nutrition for life cycle	1, 3, 5	K2
CO 3	Know the health care programmes of India	1, 3, 5	K1
CO 4	Learn the importance of community and personal health & hygiene measures	1, 3, 5	K1
CO 5	Create awareness on community health and hygiene	1, 3, 5	K3

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing;

K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code	Title of the Course	Hours	Credits
II	**24UNMB21**	**NUTRITION AND HEALTH HYGIENE**	**30**	**2**

Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)				
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO – 1	3	2	3	2	3		2	3	3	2	3
CO – 2	3	2	3	2	3		2	3	3	2	3
CO – 3	3	2	3	2	3		2	3	3	3	3
CO – 4	3	2	3	2	3		2	3	3	3	3
CO – 5	3	2	3	2	3		2	3	3	3	3
	STRONG (3), MEDIUM (2) and LOW (1)										

Prepared by : Dr.K.Chitra

Checked by: Dr.R.Janet Rani

Head of the Department

Semester - II	SERICULTURE		24UNMB21			
SEC-II (NME)			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

General Objective: To teach students the basics of sericulture, including mulberry cultivation, silkworm biology, disease management, rearing techniques, cocoon processing, and entrepreneurship in sericulture.

LEARNING OBJECTIVES

LO	The learners will able to:
LO – 1	Understand sericulture basics, mulberry varieties, and cultivation methods.
LO – 2	Learn silkworm biology and life cycle stages.
LO – 3	Identify and manage silkworm diseases and pests.
LO – 4	Master silkworm rearing and cocoon processing techniques.
LO – 5	Explore sericulture entrepreneurship and infrastructure needs.

UNIT I: Introduction to Sericulture and Mulberry Cultivation

General introduction to Sericulture, its distribution in India, Botanical distribution and taxonomical characters of mulberry varieties and species, Biology of Mulberry plant and Mulberry crop cultivation and protection.

UNIT II: Silkworm Biology and Life Cycle

Silkworm- biology-morphology of silkworm, Life cycle of silkworm- egg, larva, pupa, and moth.

UNIT III: Silkworm Pathology and Disease Management

Silkworm pathology: Introduction to Parasitism, Commensalism, Symbiosis and Parasite relationship - Mulberry Silkworm Diseases: Introduction, types, Pebrine, Grasserie, Muscardine, Flacherie, Symptoms and Pathogens, Mode of Infection, Prevention and Control -Non – mulberry silkworm diseases: Pebrine, Bacterial and viral diseases, Brief Account of Pests and Predators of Silkworms, Nature of damage and control measures.

UNIT IV: Silkworm Rearing and Cocoon Processing Techniques

Rearing of silkworm, Cocoon assessment and processing technologies, Value added products of mulberry and silkworms.

UNIT V: Entrepreneurship and Infrastructure in Sericulture

Entrepreneurship and rural development in sericulture: Planning for EDP, Project formulation, Marketing, Insectary facilities and equipments: Location, building specification, air conditioning and environmental control, furnishings and equipment, sanitation and equipment, subsidiary facilities.

Text Books

1. Ganga, G. and SulochanaChetty (2010). Introduction to Sericulture,, J., Oxford and IBH Pub. Co. Pvt. Ltd., New Delhi.
2. Dr. R. K. Rajan&Dr. M. T. Himantharaj (2005). Silkworm Rearing Technology, Central Silk Board, Bangalore.
3. Dandin S B, Jayant Jayaswal and Giridhar K (2010). Handbook of Sericulture technologies, Central Silk Board, Bangalore.
4. M. C. Devaiah, K. C. Narayanaswamy and V. G. Maribashetty (2010). Advances in Mulberry Sericulture,,CVG Publications, Bangalore
5. *T.V.SatheandJadhav.A.D. (2021). Sericulture and Pest Management,* Daya Publishing House.

References Books

1. S. Morohoshi (2001). Development Physiology of Silkworms 2nd Edition, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi
2. Hamamura, Y (2001). Silkworm rearing on Artificial Diet. Oxford & IBH publishing Co., Pvt. Ltd. NewDelhi.
3. M.Johnson, M.Kesary (2019). Sericulture, 5th. Edition. Saras Publications.
4. Manisha Bhattacharyya (2019).Economics of Sericulture, Rajesh Publications.
5. Muzafar Ahmad Bhat, Suraksha Chanotra, Zafar Iqbal Buhroo, Abdul Aziz and Mohd. Azam (2020).A Textbook on Entrepreneurship Development Programme in Sericulture, IP Innovative Publication.

Web Resources

1. https://egyankosh.ac.in › bitstream
2. https://archive.org › details › Sericulture Handbook
3. https://www.academic.oup.com
4. https://www.sericulture.karnataka.gov.in
5. https://www.silks.csb.gov.in

COURSE OUTCOMES

CO	Upon completion of this course, students would have learned to:	PSOs Addressed	Cognitive Level
CO 1	Understand sericulture basics, including its distribution in India, and the characteristics of mulberry varieties.	1,5	K2
CO 2	Describe the biology and morphology of silkworms, detailing their life cycle stages from egg to moth.	1, 2	K2&K3
CO 3	Identify and manage silkworm diseases and pests, knowing their symptoms, causes, and control methods.	1,2,3,6	K3&K4
CO 4	Apply techniques for silkworm rearing, cocoon assessment, and processing to create value-added products.	1,2,4,5,6	K3&K6
CO 5	Develop skills in sericulture entrepreneurship, including project planning, marketing, and understanding infrastructure needs like Insectary facilities.	1,2,3,4,5,6	K3&K5

K1-Remembering; K2 – Understanding; K3 - Applying; K4 - Analyzing;

K5 – Evaluating; K6 – Creating

RELATIONSHIP MATRIX

Semester	Course Code			Title of the Course			Hours		Credits	
II	24UNMB21			SERICULTURE			30		2	
Course Outcomes (COs)	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)			
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO – 1	3	2	2	2	3	2	3	3	2	2	3
CO – 2	3	3	2	2	2	2	3	3	2	2	2
CO – 3	3	3	3	2	2	3	3	3	2	3	2
CO – 4	3	3	2	3	3	3	3	3	3	3	3
CO – 5	3	3	3	3	3	3	3	3	3	3	3
STRONG (3), MEDIUM (2) and LOW (1)											

Prepared by : Mr.S.Hameedullah Sherief Checked by: Dr.R.Janet Rani

Head of the Department

Semester – II	Value Education-I		24USVE2A			
SEC-III			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

General Objective: To make students inculcate moral values, leading to faith and righteous action in their life.

Unit – I: Islam – Meaning – Importance – A complete Religion – The religion accepted by God – Five Pillars of Islam – Kalima – Prayers – Fasting – Zakat – Haj.

Iman – Monotheism – Angels – Books – Prophets – Dooms Day – Life after death – Heaven and Hell.

Unit – II: Quran – The Book of Allah – Wahi – Revelation to Prophet Muhammad(sal) – Compilation – Preservance – Structure – Content – Purpose – Source of Islamic Law– SuraFathiha, Kafirun, Iqlas, Falakh and Nas.

Unit – III: Hadith – Siha Sitha – Buhari – Muslim – Tirmithi – Abu Dawood – Nasai – Ibn Maja – Collection of Hadith – Meaning of 40 Hadith.

Unit – IV: Life History of Prophet Muhammad (sal) – AiamulJahiliya – Prophet's Childhood and Marriage – Prophethood – Life at Mecca – Life at Medinah – Farewell Address – Seal of Prophethood.

Unit – V: Good character – Etiquettes – Halal and Haram – Duties towards Allah – Duties towards fellow beings – MasnoonDuas.

Textbooks:

Publication of SadakathullahAppa College

Reference Books:

1. V.A. Moahmed Ashrof – Islamic Dimensions – Reflection and Review on Quranic Themes.
2. The Presidency of Islamic Researchers – Revised & Edited – The Holy Quran.
3. M. Manzoor Nomani – Islamic Faith & Practice.
4. Ali Nadawi, Abul Hasan– Muhammad Rasulullah., Muassasathus Sahafawa Nashr Publication Lucknow, India,1999.
5. K. Ali – A Study of Islamic History.
6. Abdul Rahuman Abdulla
   h – Islamic Dress code for Women.
7. Dr. Munir Ahamed Mughal – Code For Believers.
8. Abdul Malik Mujahid – Gems and Jewels.

Semester – II	Value Education-II		24USVE2B			
SEC-III			L	T	P	C
Hrs./Week: 2	Hrs./Semester : 30	Marks :50	2	-	-	2

UNIT I

Individual Morality – Objective of Moral life – Living in accordance with the code of Morality – the goodness of Morality – Morality and *Thirukural*- The need for faith.

UNIT II

Adherence to higher code of Morality – Fear of God – Good Moral Values – Duty to Parents – Teacher, respecting elders – Moral Etiquettes – Right-minded Principle – High Principles for Proper conduct.

UNIT III

Inculcating good attitudes – Open mindedness – Morale – analysing the pros and cons of good and bad – Service to others – Mind Power, tolerance, respecting others, showing love to others, patience – tranquility – Modesty, kindness and forgiveness.

UNIT IV

Quotations and moral Stories expressing Good characters of Great personalities – Life History of Great people: Mahatma Gandhi, Abraham Lincoln, Dr. A.P.J. Abdul Kalam.

UNIT V

Truth, the importance of uprightness, integrity, friendship – Health awareness on Alcohol and drug abuse – inculcating reading habit – reading good books – Hygiene – Dowry – Corruption.

Textbooks:

Publication of Sadakathullah Appa College.