

பருவம்: முதற் பருவம்

பாடக் குறியீட்டு எண்: LT101S

அலகு

பாடங்கள்

1. அலகு - 1 (மரபு கவிதைகள்)

- 1.1 வள்ளலார்
- 1.2 பாரதியார்
- 1.3 பாரதிதாசன்
- 1.4 கவிமணி
- 1.5 கண்ணதாசன்

2. அலகு - 2 (புதுக்கவிதைகள்)

- 2.1 அப்துல் ரகுமான்
- 2.2 மு. மேத்தா
- 2.3 வைரமுத்து
- 2.4 தமிழ்ச்சி
- 2.5 நாட்டுப்புறப்பாடல்கள்

3. அலகு - 3 (இலக்கிய வரலாறு)

- 3.1 இருபதாம் நூற்றாண்டுக் கவிஞர்கள்
- 3.2 புதுக்கவிதையின் தோற்றமும், வளர்ச்சியும்
- 3.3 சிறுகதையின் தோற்றமும், வளர்ச்சியும்
- 3.4 நாட்டுப்புற இலக்கியங்கள்

4. அலகு- 4 (சிறுகதைகள்) கதவு - கி.ரா

- 4.1 கதவு
- 4.2 குடும்பத்தில் ஒரு நபர்
- 4.3 ஜெயில்
- 4.4 மின்னல்
- 4.5 எழுத மறந்த கதை

5. அலகு - 5 (மொழித் திறன்)

- 5.1 வல்லொழ்ணு மிகுமிடம்
- 5.2 வல்லொழ்ணு மிகாமிடம்

**SEMESTER – I ENGLISH THROUGH LITERATURE – I LE101S****UNIT - 1****[15 HRS]****RELATIONSHIPS**

Freedom at Midnight – Larry Collins and Dominique Lapierre (Prose)

Night of the Scorpion – Nissim Ezekiel (Poem)

Driving Miss Daisy – Alfred Ubry (Play)

**UNIT-2****[15 HRS]****SELF ENHANCEMENT**

Ulysses – Alfred Lord Tennyson (Poem)

Our Urgent Need for Self-esteem – Nathaniel Brandon (Prose)

Emotional Intelligence – Daniel Goleman (Prose)

**UNIT - 3****[15 HRS]****BASIC GRAMMAR**

The Sentence

Parts of Speech

Nouns – Classes and Gender

Nouns – Number and Case

Adjectives

Comparison of Adjectives

**UNIT- 4****BASIC LANGUAGE SKILLS****[15 HRS]**

Dialogue Writing

Letter writing – [Formal, Informal]

Comprehension

**Text**

1. Elango, K. **Insights : A Course in English Literature and Language**. Hyderabad: Orient Black swan Private Limited, 2009.
2. Bhatnagar, R.P., and Bhargava, Rajul. **English for Competitive Examinations**. Chennai: Macmillan India Press, 2002.
3. David Green, **Contemporary English Grammar: Structures and Composition**. Chennai: Macmillan India Limited, 2004.

**Reference**

1. Prince, Donna. **Skills for Success**, New York: CUP 1998.
2. Wallace, Michael, J. **Study Skills in English**. Kottayam: CUP, 2004.

**SEMESTER – I FUNDAMENTALS OF MICROBIOLOGY MB101****Unit – 1 (21 Hrs)**

Introduction - History and Scope of Microbiology – Shape, size, arrangement of Bacteria - Structure of bacterial cell - Structure and functions of cell organelles (Cell wall, structures found outside the cell wall and within the cell wall) -Structure of Endospore.

**Unit – 2 (21 Hrs)**

Microscopy - Simple, Compound, Dark-field, Phase-contrast, Fluorescent, Electron Microscopes - Stains and dyes – staining methods.

**Unit – 3 (21 Hrs)**

Classification - Haeckel's, Whitaker's - Prokaryotes and eukaryotes - Evolution of microorganisms - Taxonomical ranks, Binomial Nomenclature - Characteristics used in Taxonomy – Outline of bacterial classification according to Bergey's manual - Important groups of bacteria - Archaeobacteria, Spirochetes, Mycoplasma, Actinomycetes, Photosynthetic bacteria, Cyanobacteria, Methanogenic bacteria, Sulfate utilizing bacteria.

**Unit – 4 (21 Hrs)**

Fungi – characteristics, morphology, reproduction, physiology, classification – Fungi of special interest - Mucor, Rhizopus, Penicillium, Neurospora, Agaricus, Saccharomyces, Candida, Lichens, mycorrhiza – Algae - occurrence, importance, characteristics, classification – Algae of special interest – Chlamydomonas, Euglena, Volvox, diatoms – Protozoa - occurrence, free-living, symbiotic, morphology, reproduction, classification – Protozoa of special interest – Amoeba, Paramecium – Viruses - general characteristics, morphology, classification – viruses of bacteria, plants, animals, human beings – T4 phage, TMV, rabies, HIV as examples.

**Unit – 5 (21 Hrs)**

Sterilization - Physical agents - High temperature, Low temperature, Desiccation, Osmotic pressure, Radiation, Filtration - Chemical agents - Phenols and phenolic compounds, Alcohols, Halogens, Heavy metals and their compounds, Dyes, Synthetic detergents, Quaternary ammonium compounds, Aldehydes, Gaseous agents -Antibiotics - Classification, Mode of action – Antifungal and antiviral agents.

**Text Books**

- Michael J. Pelzar. Jr., E.C.S. Chan, Noel R. Krieg, Microbiology, 1993 (Fifth edition), Tata McCraw Hill, New Delhi.
- Prescott, L. M., J. P. Harely and D. A. Klain, Microbiology, 2003 (5<sup>th</sup> Edition) McGraw Hill, New York.

**Reference Books**

- Talaro K. P. and A. Talaro, Foundations in Microbiology, 1999, (3<sup>rd</sup> Edition), WCB McGraw Hill.
- Atlas R. A. Principles of Microbiology (2<sup>nd</sup> Edition), 1997. Wm. C. Brown Publishers, Iowa.
- Salle A. J., Fundamental Principles of Bacteriology, 1974 (TMH Edition), Tata McGraw Hill Publishing Company, New Delhi.
- Roger Y. Stanier, John L. Ingraham, Mark L. Wheelis, Page R. Painter, Microbiology 1987 (5<sup>th</sup> Edition), Macmillan.

**SEMESTER-I BASIC BIOCHEMISTRY ABC101****UNIT I****CHEMISTRY OF CARBOHYDRATES****[20 hrs]**

Occurrence, Definition, structure : linear and ring forms (Haworth formula), classification of carbohydrates; Monosaccharides (Glucose , Fructose), Disaccharides (Lactose and Sucrose), Physical properties – Muta rotation, stereo isomerism and optical isomerism chemical properties-oxidation, reduction and osazone formation. Polysaccharides: starch and cellulose- structure and functions.

**UNIT II****AMINOACIDS****[15 hrs]**

Aminoacids- structure and classification based on structure. Standard and non standard amino acids, essential and non essential amino acid. Physical properties: Acid base properties; isoelectric points and zwitter ions. General reactions of amino acids – Edman's reaction, Sanger's reaction, reaction with Dansyl chloride, Van Slyke reaction and Ninhydrin reaction.

**UNIT III****CHEMISRTY OF PROTEINS****[10 hrs]**

Definition , classification of proteins based on size, solubility, chemical composition functions , structure of proteins- peptide bond, primary, secondary, tertiary and quaternary structure of proteins, forces that determine folding and conformation and structural organization, Physical properties: salting in and salting out and denaturation.

**UNIT IV****CHEMISTRY OF NUCLEIC ACIDS****[15 hrs]**

Definition, Nucleic acid- base, Nucleotides and Nucleosides, phosphodiester linkage; Nucleic acid types –DNA and RNA; structure- double helical structure of DNA; Denaturation , Tm and hyperchromicity structure of RNA; tRNA, mRNA and rRNA.

**UNIT V****CHEMISTRY OF LIPIDS****[15 hrs]**

Introduction, definition and classification of lipids- simple, compound(phospholipids) and derived lipids (cholesterol).Classification and nomenclature of fatty acids – saturated fatty acids; Butyric and stearic acid, unsaturated fatty acids ; oleic, linoleic and linolenic acid. Physical property- emulsification. Chemical properties- saponification number, Rancidity, acid number, Iodine number and Reichert – Meissl number.

**SEMESTER – I VALUE EDUCATION VE101**

**Unit I**

Values-concept-definition-characteristics-division of values-important of value education

**Unit II**

Personal values;self concept,self esteem,self acceptance,attitude

**Unit III**

Youth problems;career decision and unemployment,emotional and sexual adjustment, autonomy versus dependence feeling of inferiority,marriage and family,identity of roles,vocational problems and social discrimination,suggestions to cope up with stress.

**Unit IV**

Social values

Relationship with (family,college,and friendship)and social responsibility

Moral values-honesty love and concern for others-truthfulness-justice.

**Unit V**

Religious values and cultural values - Various religious of the world - Religions tolerance - Unity in diversity – secularism - Ahimsa vs terrorism

**Text Book**

Value Education - P. Paul

பருவம்: இரண்டாம் பருவம்

பாடக் குறியீட்டு எண்: LT202S

**அலகு பாடங்கள்**

அலகு - 1

- 1.1 திருமூலர்
- 1.2 சம்பந்தர்
- 1.3 திருநாவுக்கரசர்
- 1.4 மாணிக்கவாசகர்
- 1.5 ஆண்டாள்

அலகு - 2

- 2.1 பட்டினத்தார்
- 2.2 மஸ்தான் சாகிபு
- 2.3 குமரகுருபரர்
- 2.4 கலிங்கத்துப் பரணி
- 2.5 நந்திக்கலம்பகம்
- 2.6 முக்கூட்டற்பள்ளு

அலகு - 3 (உரைநடை)

நம்மால் முடியும் தமிழ் நம்பு  
எம்.எஸ்.உதயமுர்த்தி

அலகு- 4 (இலக்கிய வரலாறு)

- 4.1 சைவ சமயக் குரவர்
- 4.2 ஆழ்வார்கள் (ஆண்டாள், குலசேகர ஆழ்வார் மட்டும்)
- 4.3 சிற்றிலக்கியங்கள் (பரணி, பள்ளு, பிள்ளைத் தமிழ், கலம்பகம் மட்டும்)
- 4.4 இசலாமும் தமிழும்
- 4.5 உரைநடை வளர்ச்சி

அலகு - 5 (மொழித் திறன்)

- 5.3 கலைச் சொல் ஆக்கம்
  - 5.3.1 அறிவியல்
  - 5.3.2 ஆட்சித்துறை
  - 5.3.3 கணினி
  - 5.3.4 புழங்கு பொருட்கள்
- 5.4 மொழிபெயர்ப்புப் பகுதி
  - 5.4.1 கழுதங்கள்

SEMESTER – II ENGLISH THROUGH LITERATURE – II LE202S

**UNIT -1**

[15 HRS]

**PROSE : Contemporary Issues**

The First Atom Bomb – Marcel Junod

Climatic Change and Human Strategy – E. K. Fedcrov

Corruption : Causes, Consequences and Agenda for Further Research – Paolo Mauro

**UNIT- 2**

[15 HRS]

**LIFE STORIES**

The Diary of a young girl – Anne Frank

Wings of Fire – A.P.J. Abdul Kalam

Mother Teresa – F. G. Herod

**UNIT - 3**

[15 HRS]

**BASIC GRAMMAR**

Articles

Pronouns – Personal, Reflexive and Emphatic

Pronouns – Demonstrative, Indefinite, Interrogative, Distributive and Reciprocal.

Pronouns – Relative

Verbs – Transitive and Intransitive, Active and Passive Voice

Verbs – Mood and Tense

**UNIT - 4.**

**WRITTEN COMMUNICATION SKILLS**

[15 HRS]

Precis Writing

Note Making

Report Writing

**Text**

1. Elango, K. **Insights : A Course in English Literature and Language**. Hyderabad: Orient Black Swan Private Limited, 2009.
2. Bhatnagar, R.P., and Rajul Bharagava. **English for Competitive Examinations**. Chennai: Macmillan India Press, 2002.
3. David Green, **Contemporary English Grammar: Structures and Composition**. Chennai: Macmillan India Limited, 2004.

**Reference**

1. Prince, Donna. **Skills for Success**, New York: CUP 1998.
2. Wallace, Michael, J. **Study Skills in English**. Kottayam: CUP, 2004.

**SEMESTER – II MICROBIAL PHYSIOLOGY MB202**

**Unit – 1**

(21 Hrs)

Nutrient requirements of microorganisms - Growth factors - Nutritional types -Culture media - Pure culture – Maintenance and preservation of cultures - Environmental factors affecting growth

**Unit – 2**

(21 Hrs)

Microbial growth – exponential growth - Growth curve - Measurement of microbial growth – Batch and Continuous culture - Synchronous growth - Sporulation - Bacterial reproduction

**Unit – 3**

(21 Hrs)

Motility of bacteria – Flagellar and gliding – Chemo-, photo-, Aero-, Magneto- taxis - Uptake of nutrients – Simple, Passive, Facilitated diffusion, Active transport, Group translocation

**Unit – 4**

(21 Hrs)

Principles of energetics – oxidation-reduction reactions – respiratory chain – Energy production by anaerobic process (Glycolysis, Pentose phosphate pathway, ED Pathway, Fermentation)

**Unit – 5**

(21 Hrs)

Energy production by aerobic process (TCA, catabolism of lipids, catabolism of proteins, respiration without oxygen, heterotrophic CO<sub>2</sub> fixation, glyoxylate cycle) Energy production by photosynthesis (cyclic, non-cyclic), Mechanism of ATP synthesis - Bioluminescence

**Text Books**

- Schlegel, H.G., 1993. General Microbiology, (7<sup>th</sup> Edition), Press Syndicate of the University of Cambridge.
- Roger Y. Stanier, John L. Ingraham, Mark L. Wheelis, and Page R. Painter, Microbiology, (5<sup>th</sup> edition), Macmillan.

**Reference Books**

- Moat, A.G. and J. W. Foster, 1995. Microbial Physiology, (3<sup>rd</sup> Ed.). Wiley - LISS, A John Wiley & sons. Inc. Publications.,
- Caldwell, D.R., 1995. Microbial Physiology & metabolism, USA.Wm.C. Brown Communications, Inc.
- Dawes, I. W. and Sutherland L.W. 1992. Microbial Physiology, (2<sup>nd</sup> Edition), Oxford Blackwell Scientific Publications.

**SEMESTER-II ADVANCED BIOCHEMISTRY ABC202****OBJECTIVE**

To understand biochemical basis of various diseases and disorders

**UNIT I METABOLISM**

[20 hrs]

\*Glycolysis – Aerobic & Anaerobic – key enzymes and energetics

\*TCA –key enzymes and energetics – \*HMP shunt .Catabolism of amino acids-Deamination & transamination reactions. \*Urea cycle – (\* structure not required).

**UNIT II ENZYMES**

[15 hrs]

Definition – Classification of Enzymes – Mechanism. of Enzyme action – Lock & key & induced fit model.

Specificity – Factors affecting enzyme activity – pH, temperature & substrate concentration. MM Equation.

Allosteric enzymes

Enzyme Inhibition – Irreversible – Reversible- competitive, uncompetitive, non competitive (Kinetics not required).

**UNIT III METABOLIC DISORDERS**

[15 hrs]

Jaundice- Classification – Biochemical findings-DM – Classification – Complications – Diagnosis – Treatment – Gout – Dehydration – definition, causes, symptoms & prevention.

**UNIT IV DISORDERS OF AMINO ACID METABOLISM**

[10 hrs]

Inborn errors of metabolism –Albinism-Phenylketonuria –Alkaptonuria, Maple's syrup and Hartnup's disease .

**UNIT V CLINICAL BIOCHEMISTRY**

[15 hrs]

Enzymes –isoenzymes-functional and non functional enzymes-diagnostic enzymes associated with liver disorder and myocardial infarction.

Blood glucose, urea, uric acid, TG, ,serum alkaline phosphatase ,calcium, total protein, electrolytes-significance and normal levels(Brief Discussion)

**TEXTBOOKS :**

1. Chatterjea M.N.and Rana Shinde,1993, "Textbook of Medical Biochemistry",  
5<sup>th</sup> edition, Noida,Jaypee Brothers Medical Publishers

2. Mallikarjuna Rao N,2002, " Medical Biochemistry",2<sup>nd</sup> edition, New Delhi,New Age International  
Publishers

**REFERENCES:**

1. Lehninger David L.Nelson and Michael M.Cox,1982, "Principles of Biochemistry",  
(4<sup>th</sup> ed),UK,Macmillan worth Publishers.
2. Robert. K. Murray, Daryl K. Grammer "Harper's Biochemistry", .25<sup>th</sup> Edition, Lange Medical Books, Mc  
Graw Hill
3. Thomas .M.Devlin ,1997,"Textbook of Biochemistry with clinical correlations",4th Edition,US, Wiley-Liss
- 4..Ramakrishnan S, Prasannan K.G. and Rajan R,1980, " Textbook of Medical Biochemistry",3<sup>rd</sup>  
Edition,Chennai, Orient Longman
- 5.Bhagavan.N.V(2004), "Medical Biochemistry", (4<sup>th</sup> ed) Noida, Academic press

பருவம் : இரண்டாம் பருவம்

பாடக் குறியீட்டு எண் : EBT 201

**அலகு - 1**

எனிய முறையில் தமிழ் கற்றல்.

1. பட்டம் - சட்டம் - கட்டடம் - தட்டு - வட்டம் - மாமா
2. பாடம் - சட்டி - கட்டி - தட்டி - வடம் - மாமி
3. பட்டி - சடை - கடை - தடை - வடை - மாதா
4. படி - சாதம் - கார் - தார் - வான் - மாதம்
5. படை - சாவி - காவி - தாள் - வான் - அம்மா - அப்பா
6. பாப்பா -
7. பாட்டி -
8. பாட்டு -

**சிறு தொடர்.**

பாப்பா படி - பாட்டி கடை - கட்டடம் கட்டித்தா -

பாப்பா பாடம்படி - பாட்டி தட்டு -

பாப்பா பாட்டு படி - பாட்டி வடைத்தட்டு

**பயிற்சி.**

குடும்பத்தினர் (அ) நண்பருடன் பேச்கத் தமிழில் உரையாடல்  
 குறில் நெடில் வேறுபாட்டால் பொருள் மாறுபடும் சொற்கள்  
 பரம் - பாரம் கரம் - காரம் வரம் - வாரம் சரம் - சாரம்  
 தரம் - தாரம்

**அலகு - 2**

உயிரமுத்துக்கள், ஆய்த எழுத்து, மெய்யெழுத்துக்கள் - வகை, எண்ணிக்கையுடன் அறிதல்.

உயிரமெய் எழுத்துகள் உருவாதலைக் கற்றல்:

(வல்லின மெய்கள்)

க + அ - க ..... ற + ஒளி - றேளி

K + A - KA ..... RR + OU - RROU

**அலகு - 3**

உயிரமெய் எழுத்துகள் மெல்லினம், இடையினம்

ஙு + அ = நு ..... ன் + ஒளி - னெளி

NG + A - NGA ..... N + OU - NOU

ய் + அ = ய ..... ஸ் + ஒளி - னெளி

Y + A - YA ..... LL + OU - LLOU

ஓலி வேறுபாட்டால் பொருள் மாற்றம் (ர-ஐ, ன-ண, ல-ள, ழ)

அரம் - அறம்

உன் - உண்

வால் - வாள் - வாழ்

ஒவ்வொன்றிற்கும் ஜந்து எடுத்துக்காட்டு தருக.

**அலகு - 4**

சொல்-வகை

ஒரேமுத்து ஒருமொழி

பெயர்:

ஆ, பூ, தீ, தை, கா (சோலை)

வினை:

வா, போ, ஸ (கொடு)

தா, கா (காத்தால்)

ஈரேமுத்து ஒருமொழி:

பெயர்:

கனி, பனி, வான், காடு, வீடு

வினை:

நில், படி, பார், காண், எழு

தொடர்மொழி: பெயர்:

கபிலர், வெள்ளிவீதியார், திருவள்ளுவர், ஆண்டாள், கம்பர், பாரதியார் முக்கனி, முத்தமிழ், மூவேந்தர், நாற்றிசை, ஜம்பொறி - இவற்றிற்கு விளக்கம் தருக. முறைப்பெயர் (உறவுப்பெயர்) அம்மா, அப்பா, மாமா, .....

**அலகு - 5**

உடலுறுப்புப் பெயர்கள்:

தலை முதல் அடி வரை உள்ள உறுப்புகள்

முதலெழுத்து மாற்றத்தால் பொருள் மாற்றும் பேறும் உடலுறுப்புகள் சான்றாக:

உதயம் - இதயம்

ஊக்கு - முக்கு

பண், மண் - கண்

படி - அடி

மரம், வரம் - கால்

கல் - பல்

ஆல், பால் - கால்

கொடை - தொடை

அலை, இலை - தலை

மாது - காது

பாக்கு, வாக்கு - நாக்கு

கிழி - விழி

எழுத்து - கழுத்து

பறவைப் பெயர்கள்:

மயில், அன்னம், கிளி, புறா, குயில்

வீட்டு விலங்குகள்:

பசு, ஆடு, குதிரை, நாய், பூனை

மலர்கள்:

தாமரை, மல்லிகை, மூல்லை, செண்பகம், அல்லி

நிறங்கள்:

வானவில்லின் வண்ணங்கள் - அறிதல்

எண்கள்:

ஒன்று முதல் ஐம்பது வரை எழுத்தால் எழுதுதல்

சிறுகதை:

“புலியை ஏமாற்றிய நரி” தமிழ் - நான்காம் வகுப்பு, தமிழ் நாட்டுப் பாடநூல் கழகம், சென்னை.

**SEMESTER – II PERSONALITY DEVELOPMENT EPD201**

**Unit I**

Personality

Meaning-definition-major determinants of personality genetic determinants, social determinants, cultural determinants, psychological determinants, theories Jung's typology trait theory psychoanalytical theory importance of personality development guidance to improve personality.

**Unit II**

Mental health

Meaning-concept-definition-characteristics - influential factors - biological factors - psychological factors - socio-economic and cultural factors

**Unit III**

Stress and its management

Meaning,definition causes of stress, major life changes and environmental events - consequence of stress,stress manangement techniques.

**Unit IV**

Part-a

Anger and its manangement;

Meaning, definition, nature-causes-symtoms and consequence of anger - physiological effects and psychological effects ,techniques to control anger.

Part-b

Suicidal prevention

**Unit V**

Soft skills development - Presentation skill - Interpersonal skill - Body language

**Text Book:**

Mental health of rural youth

**Reference:**

Personality development-Elizabeth .B.Hurlock

**ABCP201- ALLIED PRACTICAL SYLLABUS (One year)**  
(For Microbiology)

**1. VOLUMETRIC ANALYSIS**

1. Estimation of Glycine by formal titration method
- 2 . Estimation of Ascorbic acid using dichlorophenol indophenol dye as link solution.
3. Estimation of Glucose by Benedict's Method.
4. Estimation of Iron.

**2.QUALITATIVE ANALYSIS**

- a) Qualitative analysis of carbohydrates  
Glucose, fructose, Arabinose, maltose, Lactose, sucrose and starch
- b) Qualitative analysis of Amino acids  
Tyrosine, Tryptophan, Arginine, Histidine and Cysteine

**3. NUCLEIC ACID EXTRACTION (Demonstration)**

1. Isolation of DNA
2. Isolation of RNA

**4. BIOCHEMICAL ANALYSIS (Demonstration)**

Amino acids by paper chromatography

**TEXTBOOKS :**

1. Dr.A.C.Deb,1983, "Fundamentals of biochemistry" 8<sup>th</sup> edition, Kolkata, New Central Book Agency
2. J.L.Jain, Sanjay Jain and Nitin Jain,1997, "Fundamentals of Biochemistry"6<sup>th</sup> Edition,New Delhi, S.Chand& company Ltd

**REFERENCES:**

1. Lehninger , David L.Nelson, Michael M.Cox, 1982, "Principles Of Biochemistry" , (4<sup>th</sup> ed )UK,Macmillan Worth Publishers.
2. Robert K. Murray, Daryl K. Grammer "Harper's Biochemistry",(25<sup>th</sup> Edition) Mc Graw Hill, Lange Medical Books.
3. Sathya Narayana. U,1999, "Biochemistry" , (2<sup>nd</sup> Edition),Kolkata,Allied Publishers..
4. Mallikarjuna Rao N,2002, " Medical Biochemistry",2<sup>nd</sup> Edition, New Delhi, New Age International Publishers
5. T.N.Pattabiraman ,1993"Principles of Biochemistry" ,( 5<sup>th</sup> edition) , Bangalore,Gajanana book Publishers and Distributors

**SEMESTER – II BASIC TECHNIQUES IN MICROBIOLOGY MBP201**

**Microscopy**

1. Wet mount
2. Simple staining
3. Gram staining – Gram positive cocci
4. Gram staining – Gram negative bacilli
5. Acid-fast staining
6. Spore staining
7. Capsule staining
8. Metachromatic granule staining
9. Motility – Hanging drop method
10. Observation of Fungi, algae and Protozoa
11. Micrometry

**Media preparation**

(Including sterilization, preparation of plates and slopes)

12. Liquid medium
13. Solid medium

**Biochemical tests**

14. Catalase test
15. Oxidase test
16. Indole test
17. Methyl red test
18. Voges-proskaur test
19. Citrate utilization test
20. Triple sugar iron agar test
21. Urease test

**Isolation of bacteria**

22. Serial dilution - Spread plating
23. Serial dilution - Pour plating

**Pure culture technique**

24. Quadrant streaking

**Microbial Physiology**

25. Measurement of Growth by Spectroscopy

பருவம்: மூன்றாம் பருவம்

பாடக் குறியீட்டு எண்: LT303S

அலகு

பாடங்கள்

அலகு -1

- 1.1 சிலப்பதிகாரம் - வழக்குரை காதை
- 1.2 மணிமேகலை - பாத்திரம் பெற்ற காதை

அலகு - 2

- 2.1 சீவகசிந்தாமணி - கேமசரியார் இலம்பகம்
- 2.2 கம்பராமாயணம் - மந்தரை சூழ்சிப் படலம்

அலகு - 3

- 3.1 பெரியபுராணம் - பூசலார் நாயனார் புராணம்
- 3.2 தேம்பாவணி - வளன் சனித்த படலம்
- 3.3 சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்

அலகு- 4 (இலக்கிய வரலாறு)

- 4.1 ஜம்பெருங்காப்பியங்கள்
- 4.2 கிறிஸ்துவக் காப்பியங்கள்
- 4.3 இசலாமியக் காப்பியங்கள்
- 4.4 சோழர்காலக் காப்பியங்கள்
- 4.5 இரட்டைக் காப்பியங்கள்

அலகு - 5

- 5.1 பண்பலை வாணொலி நிகழ்ச்சித் தொகுப்பு
- 5.2 வாடிக்கையாளர் சேவை மைய அலுவலர்
- 5.3 சுற்றுலா வழிகாட்டி
- 5.4 கடிதங்கள்
- 5.5 பொதுக்கட்டுரை

**SEMESTER – III ENGLISH THROUGH LITERATURE –III LE303S****OBJECTIVES:**

1. To enable the students learn the art of communication through reading literature.
2. To enable them appreciate literary works.
3. To make them learn the relationship between Language & Literature.

**UNIT- I SPORTS**

1. Swami and Friends – R.K. Narayan ( Prose)
2. See Off the Shine – Imogen Grosberg ( Poem)
3. The Sporting Spirit – George Orwell ( Prose)

**UNIT-II MASS MEDIA**

1. Building an Internet Culture – Philip Agre ( Prose)
2. Odds against Us – Satyajit Ray ( Prose)
3. TV as Babysitter – Jerzy Kosinski ( Prose)

**UNIT - III BASIC GRAMMAR**

1. Agreement of the Verb with the subject
2. Non – Finite Verbs
3. Strong and Weak verbs
4. The Auxiliaries
5. Anomalous Finites

**UNIT – IV BASIC LANGUAGE SKILLS**

1. Paragraph Writing
2. Phonetic symbols, transcription ( words)
3. Idioms & Phrases:
  - i. List of Idioms: An absent minded person, apple- pie order, an armchair critic, a big shot, a burning question, a cock and bull story, crocodile tears, a flying visit, laughing stock, a square deal, a tall order, birds of a feather, fish out of water, the lion's share, storm in a tea cup.

- ii. List of Phrases: Bear with, call on, call off, carry out, find out, give up, hand over, keep on, keep up, look after, set out, take over, turn down, wind up, work out.

### Text

1. Elango, K. **Insights: A Course in English Literature and Language.** Hyderabad: Orient Black Swan Private Ltd, 2009.
2. Bhatnagar, R.P., and Bargava, Rajul. **English for Competitive Examinations.** Chennai: Macmillan, 2002.
3. David Green, **Contemporary English Grammar Structures and Composition.** Chennai: Macmillan, 2010.

### Reference

1. Murphy, Raymond, **Essential English Grammar.** New Delhi: Cambridge UP, 2009.
2. Jones; Daniel, **English Pronunciation Dictionary.** Singapore: Cambridge UP, 2009.

**SEMESTER – III IMMUNOLOGY MB303**

**Unit – 1**

**(21 Hrs)**

History of Immunology – Overview of the immune system - Cells and organs of the immune system - Antigens - types, property, haptens, adjuvants, vaccines -Immunoglobulins - structure & classes, Monoclonal antibodies

**Unit – 2**

**(21 Hrs)**

Immunohaematology - Blood groups, blood transfusion, Rh incompatibilities - Antigen-Antibody reactions - Agglutination, Precipitation, Complement fixation, Immunofluorescence, ELISA, RIA

**Unit – 3**

**(21 Hrs)**

Host-Parasitic relationships - Microbial infections - Virulence and host resistance - Innate and acquired immunity – vaccines – Definitions & Types

**Unit – 4**

**(21 Hrs)**

Brief account of MHC molecules – Antigen processing and presentation – T-cell receptors – T-cell maturation, activation and differentiation – B-cell generation, activation and differentiation - Cell mediated Immunity – Lymphokines and Cytokines

**Unit – 5**

**(21 Hrs)**

Complement pathways - Classical and Alternate pathways - Hypersensitivity -Type I, II, III and IV - Basic concepts of Autoimmunity – Brief account of autoimmune diseases – Immunodeficiency – Transplantation immunology

**Text Books**

- Weir, D.M. and J. Stewart, Immunology, 1997 (8<sup>th</sup> Edition), Churchill Livingstone, New York.
- Goldsby, R.A., T. J. Kindt and B. A. Osborne, Kuby Immunology, 2000 (4<sup>th</sup> Edition) W. H. Freeman and Company, New York.

**Reference Books**

- Tizard, I. R. Immunology. 1995 (4<sup>th</sup> Edition), Saunders College Publishing.
- Roitt, I. M.. Essential Immunology, (8<sup>th</sup> Edition), Blackwell Science.
- Mark Peakman and Diego Vergani. 1<sup>st</sup> magazine, 1997, Basic and Clinical Immunology. Churchill Livingstone, New York.

**SEMESTER – III AZCMB301 CLASSICAL GENETICS & BIOSTATISTICS****(For II Year B.Sc., Micro-Biology :IV Semester)****Unit - I : Genetics and Mendel's laws :**

History of genetics – Mendel's experiments: monohybrid, dihybrid and polyhybrid cross - Mendel's laws of inheritance - hybrid vigour - gene expressivity - pleiotropism - incomplete dominance - complementary genes - epistasis - supplementary genes - duplicate genes - lethal genes - atavism - multiple genes - polygenic inheritance - continuous and discontinuous characters. Multiple Alleles and linkage - Characters and theories of multiple alleles - sub alleles and iso alleles - ABO Blood Group inheritance - Rh factor - linkage and linkage group - history - linked genes - complete and incomplete linkage - significance of linkage.

**Unit - II : Recombination in Eukaryotes :**

Mechanism – stage specificity - cytological evidence – frequency of crossing over – factors controlling crossing over – mitotic and meiotic crossing over – somatic and germinal crossing over – significance of crossing over - construction of chromosome maps – history of chromosomes – size, shape, structure, types and physiology of chromosomes- gene concept - gene function.

**Unit - III: Molecular, Human and and cytogenetics**

DNA as the genetic material – nucleic acids – structure of DNA , gene – enzyme relationship - euploidy - aneuploidy – chromosomal aberrations - Pedigree analysis – human chromosomes – eugenics and eugenics – inbreeding, outbreeding and hybrid vigour- population genetics.

**BIO-STATISTICS****Unit - IV:**

Introduction – Scope – Definition – Importance – Functions – Data – Data collection – Methods of data collection – Classification of Data – Tabulation of Data – Diagrammatic, Graphical presentation of Data – Histogram – Frequency polygon – Ogive curves. Measures of central tendency \_ Arithmetic mean – Median – Mode - Measures of dispersion – range – quartile deviation – standard deviation and coefficient of variation – mean deviation – skewness – kurtosis.

**Unit -V:**

Correlation – simple correlation – Rank correlation – Regression – Probability – Addition theorem – Multiplication theorem – Permutation and combinations - Test of significance – Hypothesis testing – Null hypothesis – alternative hypothesis – Large sample test – small sample test (Students ‘t’ test) – chi-square test – standard error – ANOVA (Analysis of variance) – one way ANOVA.

**Text Books:**

1. Verma, P.S and Agarwal, V.K 2005 ‘ Cell Biology, Genetics, Molecular Biology, Evolution & Ecology’, S. Chand and Co., New Delhi.
2. Biostatistics P. Ramakrishnan Saras Publications 1996 A.R.P. Camp Road, Kottar, Nagarkoil, Kanyakumari District.
3. Elements of Biostatistics by Gurumani Nithi Publishers.

**Reference books:**

1. Veer Bala Rastogi. 1992 .A textbook of Genetics, 9th edition, Keda Nath Ram Nath, New Delhi.
2. Karvita B. Aluwalia , 1991. ‘Genetics’ Wiley Eastern Ltd, New Delhi .
3. Sarin, C.1990. ‘Genetics’ Tata Mcgraw – Hill Publishing Co ., Ltd., New Delhi.
4. Burns. G.W .and Boltsmo, P.J. 1989. The Science of Genetics’ Macmillan publishing Co ., New York.

## SEMESTER-III BIOINSTRUMENTATION AOBI301

### UNIT I

Units of measurements: units of measurement of solutes in solution, eg. Normality, molality percentage solution. Examples for this concept. Electrophoresis-Factors affecting migration rate – tisselius moving boundary electrophoresis, paper electrophoresis-SDS -PAGE

### Unit II

pH, pOH, buffer, mechanism of buffer action -first line and second line of defense, buffers in body fluids- buffer capacity. Measurement of pH using indicator – Glass electrode and its applications

### Unit III

General principles of chromatography- partition and adsorption. Principles, operational procedure and applications of paper chromatography, column chromatography-thin layer chromatography,

### Unit IV

Procedure and applications of -Molecular sieve chromatography, gas liquid chromatography, HPLC.

### Unit V

Centrifugation technique: Basic principles –rotors-types of rotors. . Preparative and analytical ultracentrifugation techniques Sedimentation rate, Svedberg unit, differential, density gradient, isopycnic and rate zonal centrifugation

### References:

1. A biochemical guide to principles and techniques of practical biochemistry, Keith Wilson & Enneth Goulding, Cambridge Press.
2. Principles & Techniques of practical biochemistry – Keith Wilson, John Walker, Cambridge press.
3. Introduction to practical biochemistry – Shawney, Randhir Singh, Narasa Pub, N. Delhi. Analytical Biochemistry – RB Turner, Elsevier, NY.

பருவம்: நான்காம் பருவம்

பாடக் குறியீட்டு எண்: LT404S

அலகு பாடங்கள்

- 1      1.1 புறநானூறு - 74,192,312  
1.2 அகநானூறு - 02,07,34  
1.3 குறுந்தொகை - 23,38,40  
1.4 நந்தினை - 149,60,110  
1.5 ஜங்குறுநாறு - வேட்கைப் பத்து (1-5)  
1.6 கலித்தொகை - பாலைக் கலி (9.11)

- 2      2.1 பட்டினப்பாலை (120-192)  
2.2 சிறுபாணாற்றுப்படை  
2.3 மதுரைக்காஞ்சி  
2.4 மூல்லைப்பாட்டு

திருக்குறள்

- 3      3.1 அறிவுடைமை  
3.2 நட்பாராய்தல்  
3.3 புலவி நுணுக்கம்

இலக்கிய வரலாறு

- 4      4.1 எட்டுத்தொகை,  
4.2 பக்துப்பாட்டு  
4.3 ஆற்றுப்படைகள்  
4.4 திருக்குறள் கீழ்க்கணக்கில் பெறுமிடம்

மொழித்திறன்

- 5      5.1 விண்ணப்பங்கள்  
5.2 சுருக்கி வரைதல்  
5.3 நேர்காணல்

**SEMESTER – IV ENGLISH THROUGH LITERATURE -IV LE404S**

**OBJECTIVES:**

1. To enable students be aware of career prospects.
2. To make them prepare for their career.
3. To introduce students to the realm of fiction with special emphasis on character study.

**UNIT- 1 SELECTED SCENES FROM SHAKESPEARE**

- i. HE KILLS SLEEP  
*MACBETH*

Act One Scene VII and Act Two Scene II

- ii. PLAY OUT A PLAY??  
*HENRY IV PART I*

Act Two Scene IV

- iii. PATTERNS OF LOVE  
*AS YOU LIKE IT*

Act Four Scene I

**UNIT- II POETRY**

1. The Road Not Taken – Robert Frost
2. La Belle Dame Sans Merci – John Keats
3. Punishment in Kindergarten- Kamala Das

**UNIT- III SHORT STORY**

1. The Purple Dress – O'Henry
2. Chameleon – Anton Chekhov
3. The Reaping Race- Liam o' Flaherty

**UNIT- IV**

1. Phonetic Transcription ( Sentences)

**UNIT- V Basic Grammar**

1. Use of wrong prepositions
2. Unnecessary use of Articles.
3. Use of wrong Tenses
4. Punctuation & Capitals
5. The uses of prefixes & suffixes

### Text

1. **Selected scenes from Shakespeare's plays.** ed., Board of Editors. Chennai: Emerald publishers, 2002.
2. Mohanty P.K and Mahapatra, S. **An Anthology of Short Stories.** New Delhi: S. Chand & Company Ltd, 1997.
3. Ambika Sen Gupta. **Selected College Poems,** Madras: Orient Longman, 1994.
4. O' Conor, J.D. **Better English pronunciation.** New Delhi: Cambridge UP
5. **Popular Short Stories** ed. Board of Editors. Chennai: Oxford UP, 1998.

### Reference

1. Krishnasamy, N& Sriraman T. **Creative English for Communication.** Chennai: Macmillan, 2006.
2. Burton, S.H: Macmillan Master Series, Macmillan.
3. Jones, Daniel. **English Pronouncing Dictionary.** Singapore: Cambridge UP, 2006.

**SEMESTER – IV M1CROBIAL GENETICS MB404**

**Unit- 1**

**(21 Hrs)**

Central dogma of Molecular biology - Structure of DNA - Forms of DNA -DNA as the genetic material - Griffith experiment, Hershey & Chase - Denaturation and renaturation of DNA - Structure of RNA –Types - RNA as the genetic material

**Unit – 2**

**(21 Hrs)**

Organization of prokaryotic genetic material - Plasmids - Organization of eukaryotic genetic material - Chromosome – Transposons – Concept of gene – genetic code

**Unit – 3**

**(21 Hrs)**

Replication of DNA - Enzymology of replication – Mutation types – Mutagenic agents - carcinogenicity testing- DNA damage and repair

**Unit – 4**

**(21 Hrs)**

Gene expression – Detailed account of Transcription and Translation – Post-transcriptional modifications in prokaryotes and eukaryotes - Regulation of transcription - lac operon - trp operon

**Unit – 5**

**(21 Hrs)**

Genetics of bacteriophages - Lytic and Lysogenic cycles - Gene transfer mechanisms - Transformation, Conjugation, Transduction (Generalised and Specialised)

**Text Books**

- Freifelder, D., Microbial Genetics. 1987, Narosa Publishing House, New Delhi.
- Turner P. C., Mc Lennan A. G., Bates A. D and White M. R. H. Instant Notes in Molecular Biology, 2001, (2<sup>nd</sup> Edition) Published by arrangement with Bios Scientific Publishers Ltd., Oxford.

**Reference Books**

- Streips, U. N. and R. E. Yasbin, Modern Microbial Genetics, 2002 (2<sup>nd</sup> Edition), Wiley-Liss, Inc., New York.
- Benjamin Lewin, Gene VII, 7<sup>th</sup> Edition, Oxford University Press.
- Twyman, R M., Advanced Molecular Biology - A concise Reference, 1998, Viva Books Private Ltd., New Delhi.

**SEMESTER – IV SOLID WASTE MANAGEMENT AZMB402****Unit I : Introduction (20 Hrs)**

Waste – classification, quantification, solid waste management and disposal, source and generation of solid wastes – characterization, composition and classification, physico-chemical properties - Municipal solid wastes: Collection, storage and transportation – disposal methods – sanitary land fills, shredding and pulverizing, baling, incineration, composting, vermicomposting, recycling – energy recovery from wastes – municipal wastes management and handling rules (1999)

**Unit II: Industrial wastes: (20 Hrs)**

Industrial solid wastes and description – health hazards – collection and storage – treatment and disposal - liquid wastes – primary, secondary and tertiary treatments – water pollution and their effects on animals and plants – water quality standards – gaseous pollution – types and sources – air pollution control.

**Unit III: Bio-medical wastes: (20 Hrs)**

Generation – legal aspects and environmental concern – Bio-medical waste management and handling rules, 1998 – storage, handling and transportation of bio-medical wastes – disposal technologies - Hazardous wastes: Definition – characteristics – sources and transportation – radio active wastes – half life, mode of decay, effect on plants, animals and man – treatment methods; physical, chemical and biological methods – site remediation – waste minimization – hazardous waste rules, 1989.

**Unit IV : Earthworms: (20 Hrs)**

Characteristics, types – Indian species – suitable species for vermicomposting – digestion, decomposition and humification – role of microorganisms - Earthworm culture: Steps involved in the culture of indigenous and exotic species of earthworms – physical, chemical and biological requirements – protection of worms from predators – enemies of earthworms - Organic wastes: Definition – types and sources of various organic wastes – utilization of organic wastes in vermiculture and vermicomposting.

**Unit V: Composting technology:****(20 Hrs)**

Definition – types of vermicomposting – requirements – advantages – precautionary measures - nutrients enhancement of vermicompost – effect of vermicomposting in the soil fertility - Economics of vermicomposting: Small scale and large scale applications of vermicomposting – loan facilities – marketing strategies.

**Field Work:****(20 Hrs)**

Methods of vermicomposting – preparation of vermi bed – monitoring – bio-manure production – application of compost for culture operations – minor project reports.

**Text Books:**

Study materials given

**Reference Books:**

1. K.C.Agarwal, 2001. Environmental pollution: Causes, Effects and Control, Nidhi Publisher (India), Bikaner.
2. Verma, P.S., and VK. Agarwal. 2003. Environmental Biology, S. Chand and Company. Ram Nagar, New Delhi.
3. Pradyot Patnik, 1977. Hand book of Environmental Analysis. Chemical Pollutants in Air, Water, Soil and Solid wastes, Lewis Publishers, CRC Press. U.S.A.
4. S.A. Abbasi, 1998. Water Quality, Sampling and Analysis. Discovery Publishing House, New Delhi.
5. P.K. Gupta, 2000. Methods in Environmental Analysis. Water Soil and Air, Agrobios (India) Jodhpur.
6. Bhatnager and R.K. Patra (1996); Earthworm, Vermiculture and Vermicomposting, Kalyani Publishers, New Delhi.
7. C.A. Edwards and B.J. Bohlen (1996); Biology and Ecology of Earthworms, Chapman and Hall, London.
8. S. Ismail (1997); Vermicology, Orient Long man Limited, Chennai.
9. K.E. Lee (1985) 'Earthworms; Their Ecology and Relationship with Soils and Land Use', Academic Press, Sydney.
10. J.E. Satchell (Ed) (1983) - Earthworm Ecology: From Darwin to vermi culture. Chapman and Hall,"London.

**SEMESTER – IV ENVIRONMENTAL STUDIES EVS401****Unit I : Environmental studies and Natural resources** (20 Hrs)

Definition, scope and importance of environmental studies – forest resources: deforestation, mining, dams – water resources: over – utilization, floods, drought – mineral resources: exploitation, extraction and usage – food resources: food problems, overgrazing, pesticide problems, water logging, salinity – energy resources: energy needs, renewable and non renewable energy – land resources: land degradation, landslides, soil erosion and desertification – conserving natural resources.

**Unit II: Ecosystems :** (20 Hrs)

Concept, structure and function of an ecosystem – producers, consumers and decomposers – energy flow – ecological succession – food chains, food webs and ecological pyramids – types, characteristics, structure and function of forest ecosystem, grassland ecosystem, desert ecosystem and aquatic ecosystem

**Unit III: Biodiversity:** (20 Hrs)

Definition of biodiversity – genetic, species and ecosystem diversity – value of biodiversity – India as a mega diversity nation – hot spots – threats to biodiversity – endangered and endemic species of India – In-situ and Ex-situ conservation of biodiversity.

**Unit IV: Environmental Pollution:** (20 Hrs)

Cause, effects and control measures of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and nuclear hazards – solid waste management: causes, effects, control measures and disposal of wastes – disaster management: floods, earthquakes, cyclone, land slides and tsunami.

**Unit V: Social Issues, Human population and the Environment:** (20 Hrs)

Water conservation, rain water harvesting, watershed management – environmental ethics: issues and possible solution – climate change, global warming, acid rain, ozone depletion, nuclear accidents and holocaust – wasteland reclamation – Environment protection Act – Wildlife protection Act – Forest Conservation Act – public awareness – Population explosion – Environment and human health – Role of Information Technology in Environment and human health.

**Field work:** (20 Hrs)

1. Visit to a local area to document environmental assets – river / forest / grassland/mangrove.
2. Visit to a local polluted site – urban / rural / industrial / agricultural.
3. Study of common plants, insects, birds.
4. Study of simple ecosystems – pond, river, forest, etc.,
5. Practical work

**Reference Books:**

1. Joseph C.Daniel,2004. Principles of Environmental Science. Brightson's Publications,Chennai.
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India,  
Email:[mapin@icenet.net](mailto:mapin@icenet.net)
4. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi
5. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co.
6. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA,
7. Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
8. Trivedi R.K., Hand book of Environmental Laws, Rules Guidelines, Compliances and Standards. Vol I and II, Enviro Media9.Wanger K.D., 1998. Environmental Management. W.B. Saunders Co. Philadelphia, USA

**SEMESTER – IV MBP402 BASIC EXPERIMENTS IN IMMUNOLOGY & MICROBIAL GENETICS  
PRACTICAL**

**SEMESTER – V FOOD MICROBIOLOGY MB505**

**Unit – 1**

**(12 Hrs)**

Food as a substrate for microorganisms - Microorganisms important in food microbiology - Principles of food preservation - asepsis - removal of microorganisms - high temperature - low temperature-drying- food additives - radiation

**Unit – 2**

**(12 Hrs)**

Contamination, spoilage and preservation of - cereals, sugar products, vegetables and fruits, meat and meat products, fish and sea food, poultry products, canned food.

**Unit – 3**

**(12 Hrs)**

Food fermentations – bread, malted beverages, tea, coffee, idly, fermented vegetables, pickles, Oriental fermented foods

**Unit – 4**

**(12 Hrs)**

Milk and milk products - fermented dairy products - butter, cheese, yogurt, acidophilus milk - Spoilage and defects of fermented dairy products - Milk-borne diseases.

**Unit – 5**

**(12 Hrs)**

Food-borne infections and intoxications - bacterial, non-bacterial - Food borne disease outbreaks - laboratory testing - preventing measures - Food sanitation – Plant sanitation - quality control - HACCP.

**Text Books**

- Frazier W. C. and D.C, Westhoff, Food Microbiology, 1988 (4<sup>th</sup> Edition), Tata McGraw Hill Publishing Company Ltd., New Delhi.
- Banwart, G. J. Basic Food Microbiology, 1989, CBS Publishers and Distributors, New Delhi.

**Reference Books**

- Doyle, M. P., L. R. Beuchat and T. J. Montville, Food Microbiology -Fundamentals and Frontiers, 2001 (2<sup>nd</sup> Edition), ASM Press. Washington, D.C.
- Moss, M. R., and M. O. Moss, Food Microbiology, 1996. New Age International (P) Limited Publishers, New Delhi.
- Jay, J. M., Modern Food Microbiology. (4<sup>th</sup> Edition), 1996, CBS Publishers and Distributors.

**SEMESTER – V INDUSTRIAL MICROBIOLOGY MB506**

**Unit – 1**

**(12 Hrs)**

General concepts of industrial microbiology, screening and strain development strategies - raw materials used in media production media optimization – foaming - fermentation equipment and its uses – types of fermentors

**Unit – 2**

**(12 Hrs)**

Types of fermentation - batch, continuous, dual or multiple, surface, submerged, aerobic, anaerobic - Downstream process – recovery and purification of products – sterilization – development of inocula - scale up processes

**Unit – 3**

**(12 Hrs)**

Production of alcohol and beverages – Ethanol, beer and wine, vinegar - Single cell proteins - Organic acids - lactic acid, citric acid, acetic acid - Steroid transformations

**Unit – 4**

**(12 Hrs)**

Industrial production of enzymes - amylase, proteinase, cellulase - Amino acid production - glutamic acid and lysine

**Unit – 5**

**(12 Hrs)**

Production of antibiotics - penicillin, tetracycline, streptomycin – Role of precursors - Production of Vitamins - riboflavin, cyanocobalamin

**Text Books**

- Casida, L.E. Industrial Microbiology. 1968, New Age International (P) Ltd., Publishers, New Delhi.
- Patel, A.H., Industrial Microbiology, 1985, Macmillan India Ltd., New Delhi.

**Reference Books**

- Crueger W. and A Crueger, Biotechnology, 2000 (2<sup>nd</sup> Edition), Panima Publishing Corporation, New Delhi.
- Reed, G, Prescott & Dunn's Industrial Microbiology, 1982 (4<sup>th</sup> Edition), CBS Publishers Distributors, Delhi.

**SEMESTER – V MEDICAL BACTERIOLOGY MB507**

**Unit - 1**

**(12 Hrs)**

General attributes and virulence factors of bacteria causing infections - Morphology, classification, cultural characteristics, pathogenicity, laboratory diagnosis and prevention of infections caused by the following organisms - Staphylococci, Streptococci, Pneumococci, Neisseria meningitidis and N. gonorrhoea, Corynebacteria

**Unit - 2**

**(12 Hrs)**

Escherichia coli, Klebsiella, Salmonella typhi, S. Paratyphi A and S. Paratyphi B, Shigella, Proteus, Vibrio cholerae, Pseudomonas

**Unit - 3**

**(12 Hrs)**

Bacillus anthracis, Clostridium perfringens, Cl. Tetani, Cl. botulinum, Mycobacterium tuberculosis, M. leprae, Atypical Mycobacteria, Yersinia, Haemophilus, Helicobacter

**Unit - 4**

**(12 Hrs)**

Francisella, Brucella, Bordetella, Legionella, Listeria

**Unit - 5**

**(12 Hrs)**

Rickettsiae, Chlamydia, Spirochaetes, Mycoplasma, Actinomycetes

**Text Books**

- Ananthanarayanan, R and C.K.J. Panicker. Text Book of Microbiology, 2000 (6<sup>th</sup> Edition), Orient Longman Private Ltd., Chennai.
- Greenwood, D., R.C.B. Slack, and J.F. Peutherer, Medical Microbiology 1997 (15<sup>th</sup> Edition), Churchill Livingstone. New York.

**Reference Books**

- Brooks, G.F., Janet S. Butel, Stephen A, Jawetz, Melnick & Adlerberg's Medical Microbiology, 21<sup>st</sup> Edition, Prentice Hall International Inc. 1998,
- Murray. P.R., G.S, Kobayashi, M. A. Pfaller and K. S. Rosenthal, Medical Microbiology, 1993, (2<sup>nd</sup> Edition), Mosby St. Louis.

**SEMESTER – V MEDICAL PARASITOLOGY MB508**

**Unit - 1 (12 Hrs)**

Introduction – Definition – Host parasite relationship – Transmission of parasites – Pathogenesis – Clinical diagnosis – Laboratory diagnosis – Treatment.

**Unit - 2 (12 Hrs)**

Entamoeba histolytica, Entamoeba coli, Giardia intestinalis, Trichomonas vaginalis, Leishmania donovani, Trypanosoma cruzi

**Unit - 3 (12 Hrs)**

Plasmodium falciparum, Plasmodium vivax, Cryptosporidium, Balantidium coli, Pneumocystis carinii.

**Unit - 4 (12 Hrs)**

Taenia saginata, Taenia solium, Schistoma haematobium, Fasciola hepatica, Trichuris trichura.

**Unit - 5 (12 Hrs)**

Ancylostoma duodenale, Enterobium vermicularis, Ascaris lumbricoides, Wuchereria bancrofti, Brugia malayi.

**Text Books**

- Parija, S. C, Text Book of Medical Parasitology. 1996, All India Publishers and Distributors Regd., Chennai.
- Ananthanarayan. R. and C.K.J. Panicker, Text Book of Microbiology, 2000 (6<sup>th</sup> Edition), Orient Longman Private Ltd., Chennai.

**Reference Books**

- Franklin A. Neva and Harold W. Brown, Basic and Clinical Parasitology, 1994, VI Edition, Appleton & Lange, Norwalk, Connecticut.
- Ichhpujani, R.L. and R. Bhatia. Medical Parasitology 3<sup>rd</sup> Edition, 2002, Jaypee Brothers, Medical Publishers (P) Ltd., New Delhi.

**SEMESTER – V ENVIRONMENTAL MICROBIOLOGY EMB509****Unit - 1 (12Hrs)**

Microbiology of air - droplet nuclei, aerosols - enumeration of microorganisms in air- air sanitation - Laboratory hazards - airborne diseases

**Unit - 2 (12Hrs)**

Aquatic microflora - lakes, ponds, rivers, ocean, estuary, ground water -significance – study of aquatic microflora - Waterborne diseases - Eutrophication

**Unit - 3 (12Hrs)**

Waste water treatment - primary, secondary (anaerobic and aerobic - trickling, activated sludge, oxidation pond) - Sludge digestion - Disposal - Drinking water treatment - chlorination - Microbiological standards of water

**Unit - 4 (12Hrs)**

Water pollution – indicators water pollution - BOD - COD – techniques for the study of water pollution - Composting

**Unit - 5 (12Hrs)**

Interaction among microbial populations (Neutralism, commensalisms, parasitism, antagonism) – bioleaching – Symbiotic relationship with animals

**Textbooks**

- Atlas & Bartha, Microbial Ecology - Fundamental and Applications, 1998, Benjamin/ Curmmings Publishing Company, Inc., California
- Joseph C. Daniel. Environmental Aspects of Microbiology, 1996, Brightsun Publications, Chennai.

**Reference Books**

- Mitchell, R (ed) Environmental Microbiology. 1992, John Wiley, New York.
- Grant W. D. and Long P.E., Environmental Microbiology, 1981 Blackie and Son Ltd., Glasgow

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**SEMESTER – V APPLIED MICROBIOLOGY EMB510****Unit - 1 (12Hrs)**

Algal technology - Spirulina cultivation - Factors affecting Biomass production - Requirements for growth of Spirulina - Algal tanks - Avoiding contamination - Mass cultivation of Spirulina - Semi - Natural Lake system, Artificial built cultivation system - Clean water system - Harvesting the Biomass & Product recovery - Benefits from Spirulina.

**Unit - 2 (12Hrs)**

Mushroom production - Mushroom biology - classification and types -Edible and poisonous mushrooms - Spawn and spawning - culture media - Preservation and storage of cultures - Crop management after spawning - casing, fruiting, harvesting -Processing - Mushroom recipes

**Unit - 3 (12Hrs)**

Biofertilizers - Bacteria – Bacterization - Mass cultivation of Rhizobium -Azotobacter- Azospirillum and phosphate solubilizers - Blue green algae- Algalization, Mass cultivation of Blue green algae. Azolla as Biofertilizer, Mycorrhzae as biofertiliser.

**Unit - 4 (12Hrs)**

Biogas production – Introduction – interaction between various microbial groups – factors affecting production – design of digester – distribution of anaerobic organisms – methanogens and methanogenesis – alternate feed stock and other wastes – kinetics of fermentation – use of spent slurry.

**Unit - 5 (12Hrs)**

Bioremediation – Clean-up Biotechnology – Microbial removal of metal ions – Soil Bioremediation – Removal of oil spill – Biodegradation of hydrocarbons – Genetically modified organisms.

**Text Books**

- Pathak, V.N., N.Yadav and M.Gaur, Mushroom – Production and processing technology, 2000, Agrobios, Jodhpur.
- SubbaRao, N S. Biofertilizers in Agriculture and Forestry, 1995 (3<sup>rd</sup> Edition), Oxford & IBH Publishing Co, Pvt. Ltd. New Delhi.


**Reference Books**

- Sharma, A.K., Biofertilizers for Sustainable Agriculture, 2002, Agro bios India.
- Singh, H., Mushrooms - The Art of Cultivation, 1991, Sterling Publishers Pvt. Ltd. New Delhi.