



YADAVA COLLEGE

(Autonomous)

Govindarajan Campus, Thiruppalai, Madurai- 625014

DEPARTMENT OF BIO CHEMISTRY

PROGRAMME OUTCOMES

- 1. To apply contextual knowledge and modern tools of biochemical research for solving problems.**
- 2. A strong understanding of biochemical process at advanced level.**
- 3. Capacity to identify, analyse the experimental process to provide efficient solutions.**
- 4. Screening of micro –organisms storage and preservation of industrially important microbes**
- 5. To make aware of microscopic living system and organism. They can work across a spectrum of private industries or government agencies.**

PROGRAMME SPECIFIC OUTCOMES

- 1. Acquire knowledge about clinical Haematology and biochemical techniques for isolation of biomolecules.**
- 2. Practical work make the students skill full, this skill will help to design outdoor activities.**
- 3. Applied the fundamentals of molecular biology. The application of the course lays the foundation to understand the disease processes.**
- 4. To implement the use of techniques in biological research and in discovering new products.**
- 5. Facilitates to understand the concepts of gene cloning. They will also be help with modern techniques such as PCR technology and DNA finger printing.**

DEPARTMENT OF BIOCHEMISTRY
Yadava College (Autonomous), Madurai – 625014.

Choice Based Credit System course content - for those who joined in June 2022 - 23

Semester	Subject code	Title of the paper	Teaching Hours / week	Credit	Duration of Exam	Evaluation		Total
						Internal	External	
I	Part I	Tamil	5	3	3	25	75	100
	Part II	English	5	3	3	25	75	100
	Part III Core	Bio molecules	4	5	3	25	75	100
		Major Practical I Qualitative analysis of biomolecules & Colorimetry	2	-	-	-	-	-
	Allied I	General Chemistry	5	2	3	25	75	100
	Allied II	General Biology	5	2	3	25	75	100
	Part IV	Environmental Studies	2	2	3	25	75	100
		Skill Based Elective Communicative English I	2	2	3	25	75	100
	Part V	PE / NCC / NSS / EXT	-	-	-	-	-	-
II	Part I	Tamil	5	3	3	25	75	100
	Part II	English	5	3	3	25	75	100
	Part III Core	Enzyme and Enzyme technology	4	5	3	25	75	100

		Major Practical I Qualitative analysis of biomolecules &Colorimetry	2	1	3	40	60	100
Allied I		Organic Chemistry	3	2	3	25	75	100
		Chemistry Practical I Volumetric Analysis	2	1	3	40	60	100
Allied II		Cell Biology	3	2	3	25	75	100
		Biology Practical I General & Cell Biology	2	1	3	40	60	100
Part IV		Value Based Education	2	2	3	25	75	100
		Skill Based Elective Communicative English II	2	2	3	25	75	100
Part V		PE / NCC / NSS / EXT	-	-	-	-	-	-

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Choice based credit system course content for those joined in June 2022 -23

Semester	Part	Subject code	Title of the paper	Teaching Hours / week	Credit	Duration of Exam	Evaluation		Total
							Internal	External	
III	Part I		Tamil	5	3	3	25	75	100
	Part II		English	5	3	3	25	75	100
	Part III Core		Metabolism	4	5	3	25	75	100
			Major Practical II Quantitative analysis of Bio molecules	2	2	3	40	60	100
	Allied I		Industrial Chemistry	5	2	3	25	75	100
	Allied II		Genetics	5	2	3	25	75	100
	Part IV		Non-major elective	2	2	3	25	75	100
			Skill Based Elective Communicative English III	2	2	3	25	75	100
	Part V		PE / NCC / NSS / EXT	-	-	-	-	-	-
IV	Part I		Tamil	5	3	3	25	75	100
	Part II		English	5	3	3	25	75	100
	Part III Core		Clinical Biochemistry	4	5	3	25	75	100
			Major Practical III Clinical Biochemistry	2	2	3	40	60	100

Allied I		Bio-Physical Chemistry	3	2	3	25	75	100
		Chemistry Practical II Analysis of organic compounds	2	1	3	40	60	100
Allied II		Bio statistics	3	2	3	25	75	100
		Biology Practical I Genetics & Bio statistics	2	1	3	40	60	100
Part IV		Non-Major Elective	2	2	3	25	75	100
		Skill Based Elective Communicative English - IV	2	2	3	25	75	100
Part V		PE / NCC / NSS / EXT	-	-	-	-	-	-

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Choice based credit system course content for those joined in June 2022 -23

Semester	Subject code	Title of the paper	Teaching Hours / week	Credit	Duration of Exam	Evaluation		Total
						Internal	External	
V		Medicinal Biochemistry	5	5	3	25	75	100
		Microbiology & Immunology	5	5	3	25	75	100
		Bio Techniques	5	5	3	25	75	100
		Molecular Biology	5	5	3	25	75	100
	Part III Core	Major Practical IV Microbiology & Medicinal Plants	4	2	3	40	60	100
		Major Practical V Immunology & Biochemical Techniques	4	2	3	40	60	100
	Part IV	Skill Based Elective Soft Skills - I	2	2	3	25	75	100
	Part V	PE / NCC / NSS / EXT	-	-	-	-	-	-
VI		Nutrition & Dietetics	4	4	3	25	75	100
		Plant Biochemistry	4	4	3	25	75	100

	Part III Core	Herbal Drug Technology	4	4	3	25	75	100
		Genetic Engineering and Industrial Biotechnology	5	5	3	25	75	100
		Bio informatics	5	5	3	25	75	100
		Major Practical VI Biotechnology and Bio informatics	3	2	3	40	60	100
		Major Practical VII Herbal drug Technology	3	2	3	40	60	100
	Part IV	Skill Based Elective Soft Skills – II	2	2	3	25	75	100
	Part V	PE / NCC / NSS / EXT	-	1	-	-	-	-

Paper -1
BIOMOLECULES

Semester: I

Subject Code:

Hours per Week: 4 hrs

Credit :5

Total Hours per Semester: 60 hrs

Objectives :

- To have basic knowledge in the field of Biochemistry.
- To know about the structures and functions of carbohydrates, proteins, lipids, nucleic acids, vitamins and minerals.

Unit I Macromolecules I(12hrs)

Carbohydrates - occurrence and general importance of carbohydrates – Basic structure of glucose, its isomers ,epimers and linkages- Biologically important disaccharides like lactose, maltose and sucrose – Polysaccharides – Energy storage polysaccharides, Starch and Glycogen, Structural polysaccharides, Cellulose, Pectin, and Chitin

CO: Thorough knowledge about the structure and importance of carbohydrates

Unit II Macromolecules II (12hrs)

Lipids – structure classification and general properties -Fatty Acids - Classification of Fatty acids -Saturated fatty acids, Unsaturated fatty acids, Branched chain fatty acids, and Cyclic fatty acids -Reactions of unsaturated fatty acids - hydrogenation, halogenation and oxidation. Phospholipids in its various organs and its composition- sphingomyelins, cerebrosides, gangliosides and ceramides.

CO: In depth knowledge about the classifications of lipids and fatty acids and discuss the reactions of unsaturated fatty acids

Unit III Macromolecules III (12hrs)

Amino acids and Proteins; Definition, amino acids as ampholytes, structure and classifications of amino acids -physical properties of amino acids, electrical properties, fundamental role of proteins in life - Protein classification, structure and general properties of proteins. Hierarchical structure of proteins- primary, secondary, tertiary, quaternary structures and classification of proteins on the basis of their biological functions.

CO: Categorize the different types and structure of amino acids, proteins and discuss their function

Unit IV Macromolecules IV (12hrs)

Nucleic acids- fundamental role of nucleic acids in life processes - structure of bases, nucleosides and nucleotides - bonds linking the various bases, Chargaff's rule, structure, types of RNAs and its non-coding types and various forms of DNA -Watson and Crick Double helical model of DNA .

CO: Understand the significance of nucleic acids and acquire the knowledge about DNA and RNA

Unit V Micromolecules (12hrs)

Vitamins: Definition, classification -fat soluble vitamins – Vitamin A, D, E and K – Water - soluble vitamins; Vitamin B complex, Vitamin C – Brief mention of sources and physiological role.

Minerals- Definition, Types- Macro and Micro minerals- Macro minerals- Ca, P, K, Fe –Sources and Physiological role. Micro minerals- Zn, Mn.

CO: Get wide idea about vitamins and minerals briefly understand the sources and its biological role

Pedagogy (Teaching Methods):

Ex: Seminar, Group discussion, PPT, Chalk and talk ,OHP ,etc.,

TEXT BOOKS:

- J.L.Jain., Sanjay Jain, Nitin Jain (2004), Fundamentals of Biochemistry, S. Chand and Co., New Delhi.
- Satyanarayana.U. (2019), Fundamentals of Biochemistry, Allied Books Pvt Ltd ,Calcutta.
- Ambika Shanmugam (2006), Fundamentals of Biochemistry for medical students, Eighth Edition.

REFERENCE BOOKS:

1. West E.S., Todd, W.R., Manson H.S. and Van Bruggan J.J. (1967). Textbook of Biochemistry, 4th edition The Macmillan Company, New York.
2. Lehninger, A.L. (2021). Biochemistry. Eighth edition, Kalyani Publishers. India.
3. Lubert Stryer, (1988). Biochemistry. 3rd edition, W.H. Freeman and Company, New York.
4. Conn, E.E. and Stump, K. (2006). Outlines of Biochemistry, Fourth edition, Wiley Eastern Limited.

E –Resources:

1. <https://www.routledge.com> ,book
2. <https://www.kobo.com> ,ebook ,biomolecules
3. <https://www.elsevier.com> ,verma

Course Designer**Mrs. G.KAVITHA**

Paper - II
ENZYME AND ENZYME TECHNOLOGY

Semester: II

Subject Code:

Hours per week: 4hrs

Credits: 5

Total Hours per Semester: 60 hrs

Objectives:

- To integrate the practical aspects of enzymology , with the kinetic theory and a mechanistic overview of enzyme activity and regulation in cell.
- To know about the enzyme immobilization techniques; it's application in various fields.

Unit I: Introduction to enzymes (12hrs)

Definition – History, Nomenclature, classification, general properties, biological role of enzymes. Enzyme unit – IU – Katal, Enzyme turnover- Definitions – coenzymes, holoenzyme, apoenzyme, prosthetic group, metalloenzyme, multi enzyme, zymogen – isoenzymes and their applications, isolation and purification of enzyme and enzyme specificity.

CO: Reveal the knowledge of enzyme types and its properties

Unit II: Enzyme kinetics (12hrs)

Factors affecting enzyme activity –enzyme concentration, substrate concentration, temperature and pH –Derivations of Michaelis Menten equation for uni substrate reaction - K_m and its significance – LB Plot.

CO: Gain a knowledge about factors affecting enzyme activity

Unit III: Enzyme inhibition (12hrs)

Reversible and irreversible inhibition, competitive, non competitive and uncompetitive inhibition and allosteric enzymes. General mechanism, feedback inhibition- enzyme repression and induction.

CO: Categorize the different types of inhibition

Unit IV: Cofactors in enzyme catalysis (12hrs)

Role of cofactors in enzyme Catalysis –NAD⁺/NADP, FMN/FAD⁺ and coenzyme pyridoxal phosphate, Tetra hydro folate, mechanism of action of chymotrypsin. Multienzyme example: PDH

CO: Analyse enzyme catalysis and its mechanism of action

Unit V: Enzyme Technology (12hrs)

Immobilized enzymes- Methods of immobilization and its effect on enzyme activity
Clinical and industrial applications of immobilized enzyme. Biosensors and its applications.

CO: Recognize applications of immobilization and have a basic principle of biosensor and its applications

Pedagogy : (Teaching Methods)

Ex: Chalk and talk , OHP , Seminar and Group discussion

TEXT BOOKS:

1. Jain. J.L., Sunjay Jain, Nitin Jain. (2004). Fundamental of Biochemistry. S.Chand and co., New Delhi
2. Satyanarayana .U. Fundamentals of Biochemistry ,Allied and Books Pvt Ltd Calcutta ,2019
3. General Enzymology Kulkarni .Deshpande (2007) Himalaya publishing House.

REFERENCE BOOKS:

1. Alan Fersht. (1995). Enzyme Structure and Mechanism, 2nd Edition, W.H.Freeman and Company New York
2. Eric. Conn. E., Stump, P.K., Roy, G.B. and Doi, H. (2001). Outlines of Biochemistry, 5th Edition, John Wiley and Sons, New york.

3. Stryer, L. (2019). Biochemistry, 9th Edition, W. H. Freeman and Company, New York.
4. Lippincott's Illustrated Reviews Biochemistry, 7th Edition, 2016, J. B. Lippincott Company.
5. Voet, D., Judith G.Voet. (2018). Biochemistry, 5th Edition, John Wiley and Sons INC, New York.

E Resources :

1. <https://www.vet.ebooks.com>
2. <https://application.wiley.vch>
3. <https://www.kopykitab.com>

Course Designer

Mrs. G.KAVITHA

PRACTICAL -1
QUALITATIVE ANALYSIS OF BIOMOLECULES AND
COLORIMETRY

Semester: I &II

Subject Code:

Credits: 1

Hours per Week: 2 hrs

Total Hours per Semester: 30 hrs

Objectives:

The main objectives of this course are to ,

- Able to analyze carbohydrate, proteins, lipid systematically
- Able to separate biochemical compounds from their natural sources.
- Students learn and handle the instruments like p^H meter and colorimeter.
- To enable the students to learn about the enzymes and its isolation which will pave the ways in which the students can enter in research field.
- The student will gain awareness about basic reactions of biomolecules and their utility in identification of adulterants

1. Qualitative analysis of Bio-organic compounds:

- i) Analysis of carbohydrates –Glucose, fructose, Sucrose, Lactose and Starch
- ii) Analysis of amino acids –Arginine, Tyrosine, Histidine and Cysteine
- iii) Analysis of proteins
- iv) Analysis of lipids

2. Biochemical preparation

- i) Isolation of Starch from potato and its quantification
 - ii) Isolation of Casein from milk.
3. Preparation of acidic and basic buffer used by pH meter.
 4. Determination of iodine value of oil or fat
 5. Determination of Saponification value of oil or fat
 6. Determination of Acid number of oil or fat.

7. Determination of salivary amylase.
8. Colorimetric method.
 - i) Determining the extinction co-efficient of a given coloured compound
 - ii) Determining the concentration of any given coloured compound using a standard graph.

Course Outcomes:

- Learn about the biochemical methods for analyzing the biological compounds.
- Know about enzymes assay
- To acquire knowledge about the separation techniques.
- Expertise in estimation of various biomolecules.

REFERENCE:

1. Jayaraman, J. (1981). Laboratory Manual in Biochemistry, 1st Edition. New Age International [p] LTD. Publisher Pune.
2. Pattabiraman, T.N. (2015). Laboratory Manual in Biochemistry, 4rd Edition. All India Publishers.
3. Sadasivam,S. and Manickam.A. (1996). Biochemical Methods, 2nd Edition. Wiley Eastern Limited.
4. Sawhney, S.K. and Randhir Singh, (2000). Introductory Practical Biochemistry, 1st Edition. Narosa Publication.
5. David. T. Plummer, (1987). An Introduction to Practical Biochemistry, 3rd Edition. McGraw – Hill Edition
6. Palanivelu, P. (2004). Laboratory Manual for Analytical Biochemistry, Separation Technique. 3rd Edition, Twenty first century publications.

Course Designer

Mrs. G.KAVITHA

ALLIED -II

Concepts in Biology

Common for B.Sc., Biochemistry & B.Sc., Microbiology (For those who joined in June
2022 -23)

GENERAL BIOLOGY

Semester: I

Subject Code:

Hours per Week: 5 hrs

Credits: 2

Total Hours per Semester: 75 hrs

To enable the learners

- To have basic knowledge of classification general characters and vegetative structure of plants.
- To enrich their knowledge on human anatomy and physiology.
- Knowledge about role of hormones and enzymes in human.
- To gain the knowledge about various kinds of human systems.

Part A - BOTANY

Unit I (15 Hours)

Introduction- general characters and classification of Algae based on F.E. Fritsch system. Occurrence, structure and heterocyst function of *Nostoc*. Introduction- general characters and classification of Fungi based on Alexopolous system. Occurrence and structure of *Aspergillus*. Introduction- general characters and classification of Bryophyte based on Rothmaler system. Occurrence, structure of *Marchantia*. (Reproduction does not required) Economic importance of Algae and Fungi and Bryophytes.

Course outcomes:

- **To know idea about general characters of algae, fungi and Bryophytes.**
- **Study about morphology and economic importance of cryptogamic plants.**

Unit II (15 Hours)

General characteristic features of Pteridophytes, classification based on G.M. Smith. structure and heterospory habit of *Selaginella*. General characteristic features of Gymnosperms, classification based on Sporne – Habitat, Distribution and external structure of *Pinus* (Reproduction does not required). Economic importance of Pteridophytes and Gymnosperms. Bentham and Hooker classification of Angiosperms Monocot- Musaceae- *Musa paradisiaca*, Dicot- Apocynaceae - *Catheranthes roseus*.

Course outcomes:

- **Understand the characteristic features of external structure and economic importance of Pteridophytes and Gymnosperms.**
- **To know the vegetative and floral characters of monocot and Dicot plants.**

PART B - HUMAN ANATOMY AND PHYSIOLOGY

Unit III (15 hours)

1. **Digestive system:** Organization of Human digestive system, Role of enzymes and Hormones secretions in digestion process, structure and function of Microvilli, Digestion and absorption of Carbohydrates, Proteins and Fats.
2. **Respiratory system:** Organization of Human respiratory system, Gaseous exchange in mammal, Structure of alveolus and mechanism of respiration Inspiration and Expiration, Control of ventilation, Lung volumes and capacity. Respiratory Quotient (RQ). Respiratory pigments and their significance- Haemoglobin.

Course outcomes:

- **Acquire knowledge about the role and secretion of enzymes and hormones in digestion.**
- **To understand the importance and mechanism of human respiration**

Unit IV (15 hours)

3. **Circulatory system:** Blood- Composition, components and functions of blood, Blood buffer, Structure of Human heart, Cardiac cycle, origin and conduction of heart beat- Regulation of heart rate. - ECG.

4. **Excretory system:** Organization of human excretory system, Mechanism of Urine formation, Counter –Current Mechanism, Acid- Balance, Dialysis – principles and mechanism.

Course Outcomes:

- **To know the essential role of blood and importance of blood flow in our body**
- **Analyze the structure and function of human excretory system**

Unit V (15 hours)

5. **Endocrine system:** Organization and functions of Endocrine glands – Hypothalamus, Pituitary, Adrenal and Thyroid glands. Role of hormones in growth and development in humans.

6. **Reproductive system:** Organization of male and female reproductive organs, development of Sperm and Egg, Hormonal control of spermatogenesis, oogenesis and menstrual cycle. Structure of Sperm and Ovum, pregnancy trimesters and birth control measures.

Course outcomes:

- **To understand the role and anatomy of various secretory glands in human.**
- **To reveal the knowledge about development of male and female gametes.**

Pedagogy (Teaching Methods):

- Ex: Seminar, Group discussion ,PPT ,Chalk and talk ,OHP, Assignment etc.

Reference Books:

1. Dutta, A.C., (2022) Botany for degree students, 6th Edition, Oxford University press.
2. Vashista, B.R., Sniha, A.K., Singh.V.P., (2008) Botany for Degree students. S.Chand Company LTD.
3. Pandey. B.P., Text Book of Botany Vol. I and II, (2009) S.Chand and Company. New Delhi

4. P.S.Verma., R.A.Agarwal (2000) Animal Physiology, S.Chand and Company. New Delhi
5. Rostogi, S.C., (2016), Essential of Animal physiology, 4th Edition. New Age International Publishers.

Text Books:

1. Taylor W.T., and Wehe. R.J (2013), General biology, 3rd Edition, East West Press Pvt. LTD.
2. Guyton A.C., and Hall J.E, (2020), Textbook of Medical Physiology, 14th Edition, W.B. Saunders Company.
3. Sujit. K. Chaudri., (2002). Concise Medical Physiology, 4th Edition, New Central Book Agency, Kolkata
4. Chatterjee's., C. C., (2020), Human Physiology, 13th Edition, CBS Publishers and Distributors private limited.
5. Sembulingam and Prema sembulingam (2016) Essentials of medical Physiology, 6th Edition, JAYPEE Publications.
6. Sathya, P, Viji Devanand (2022) , Text Book of Physiology, 2nd edition, CD publication.

E. Books

1. [http:// www.kullabs .com](http://www.kullabs.com)
2. [http:// www.preserve articles .com](http://www.preservearticles.com)
3. <http://padeepz.net>
4. [http://books.google .com](http://books.google.com)
5. [http:// kobo.com](http://kobo.com)
6. [http:// e.books.com](http://e.books.com)

Course Designer

1. **Dr. S. Kasthuri Rengamani,**
2. **Mrs. K. Kothaiselvi**

Paper – II
CELL BIOLOGY

Semester: II

Subject Code:

Credits: 2

Hours per Week: 3 hrs

Total Hours per Semester: 45 hrs

To enable the learners

- Provide the knowledge on advances in cell biology.
- Students will enhance their knowledge by knowing about microscopy, cell organelles of prokaryotic and eukaryotic cells.
- Helps to study the significance of mitosis and meiosis cell division.

Unit I (9 Hours)

1. Microscopy – Basic principles of microscopy- magnification- Types of microscopes- Light and Electron microscopes. Types of lenses (SEM and TEM).
2. A brief comparative study of prokaryotic and eukaryotic cell. Plasma membrane- Ultra structure (Fluid Mosaic Model alone) and function.

Course Outcomes:

- **Understand the principles of microscopy, structure of plasma membrane.**
- **Gain knowledge about prokaryotic and eukaryotic cells.**

Unit II (9 Hours)

1. Brief account on chemistry of protoplasm, Structure and functions of microtubules and microfilaments. Study of cell inclusions, Cystolith and Raphides.
2. Ultra structure and functions of Endoplasmic reticulum, Ribosomes, Golgi bodies and Dictyosomes.

Course Outcomes:

- **To gain the knowledge about chemistry of protoplasm.**
- **Analyze the structure and functions of cell organelles**

Unit III (9 Hours)

1. Ultra structure and functions of Mitochondria and Chloroplast.
2. Chemistry, structure and functions of nucleus– Nucleolus, Human Chromosomes- structure and special types of chromosomes- Giant, Polytene and Lamp brush chromosome.

Course Outcomes:

- **Understand the ultra structure and functions of mitochondria and chloroplast**
- **To get idea about structure of chromosomes.**

Unit IV (9 Hours)

1. Cell cycle - various phases of cell cycle, mitosis, meiosis and their significance.
2. Cancer-Origin, Properties and characteristic features of cancer cell- Tumour markers- properties and functions.

Course Outcomes:

- **Analyze the process of divisions of cell and its impacts.**
- **Assess the properties of cancerous and stem cells.**

Unit V (9 Hours)

1. Cytological Techniques – Specimen preparation, Fixatives – Types and Mechanism Staining- Types, Mechanism, Methods, Stains used for detection- Biuret Test, Sudan black, Schiff's reagent.
2. Cell fractionation – gradient and differential centrifugation.

Course Outcomes:

- **Develop the knowledge of cytological techniques.**
- **Gain knowledge about centrifugation.**

Pedagogy (Teaching Methods):

- Ex: Seminar, Group discussion ,PPT ,Chalk and talk ,OHP, Assignment etc.

Reference

1. Albert, B.Bray , Lewis. D., J. Raff, M. Roberts K and Walter, P (2002) Molecular biology of the cell, 4th Edition, Newyork, Garland.
2. Alberts, Bruce, Hopkin, Karen, Johnson, Alexander, D. Morgan, David, Raff (2018), Essential Cell Biology, 5th International Student Edition, WW Norton and Company.
3. Shukla. R.M. A Textbook of Cell Biology, Dominant Publishers & Distributors 1st Edition, 2005.

Text Books:

1. Gerald Karp, Janet Iwasa, Wallace Marshall (2022), Cell and Molecular Biology, 8th Edition, Willey Publishers.
2. Powar, C.B., (2010) Cell Biology, 6th Edition, Himalaya Publishing house, Mumbai
3. Krishnamurthy, K.V., Methods in Plant Histochemistry, S. Viswanathan printers and publishers, 6th Edition. 2014.

E.Resourses

1. [http:// www.kullabs .com](http://www.kullabs.com)
2. [http:// www.preserve articles .com](http://www.preservearticles.com)
3. <http://padeepz.net>
4. [http://books.google .com](http://books.google.com)
5. [http:// kobo.com](http://kobo.com)
6. [http:// e.books.com](http://e.books.com)

Course Designer

Dr.S.Kasthuri Rengamani

Practical Paper- I

GENERAL BIOLOGY AND CELL BIOLOGY

Semester: I & II

Subject Code:

Credits: 1

Hours per Week: 2 hrs

Total Hours per Semester: 30 hrs

To enable the learners

- To instill knowledge of morphological structures of plants.
- Examine the vegetative and floral characters of monocot and dicot plants.
- Examine the different blood components.
- Analyze the quality and different enzymes secretion in human body.
- Students will study about microscopy, centrifugation and cytological techniques.

GENERAL BIOLOGY

1. Vegetative structure in *Nostoc*, *Aspergillus*, *Marchantia*, *Selaginella* and *Pinus*
2. Section cutting of *Nostoc thallus*, *Selaginella* Stem and *Pinus* Needle
3. Structure of Monocot flower – *Musa paradisiaca*
4. Structure of Dicot flower – *Catheranthes roseus*
5. Study of Blood Cells of Man.
6. Effect of salivary amylase activity in different temperature and different pH
7. Hemin Crystals.
8. Effect of Isotonic, Hypertonic and Hypertonic saline solution on Erythrocytes.

Spotters:

1. Anatomy of human Kidney
2. L.S of Nephron
3. Developmental stages of sperm and Egg
4. Gigantism and Dwarfism
5. Acromegaly, Exophthalmic goitre
6. Thyroid metamorphosis
7. L.S of Mammalian Ovary

CELL BIOLOGY

1. Microscope – Compound microscope and its working principles.
2. Centrifugation and its working principles.
3. Study of cell inclusions- Cystolith and Raphides
4. Study of mitosis by smear technique of *Allium cepa* root tip
5. Preparation of Squamous epithelium from buccal smear
6. Demonstration of Cytological staining techniques Biuret test, Sudan black and Schiff's reagent.

Reference:

1. Dutta, A.C., Botany for degree students, Oxford University press.
2. Taylor, W.T., and Wehe R.J., General biology, East West Press Pvt. LTD.
3. De Robertis, E.D.P. and De Robertis, Jr. E.M.E., Essentials of cell and molecular biology.
4. Fawcett, D.W., The cell, its organelles and inclusions – Philadelphia W.B. Saunders
5. Krishnasamurthy K.V., Methods in plant Histochemistry Viswanathan printers & publishers.
6. Vidhya Kalaivani Rajkuma, (2016) Animal Physiology and Biochemistry manual.

E.Resources:

1. <http://book.authority.org>
2. <http://central.edu>
3. <http://world.us.elsevier.com>

Course Designer

1. **Dr.S.Kasthuri Rengamani**
2. **Mrs.K.Kothai Selvi**