



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016

DEPARTMENT OF BIOCHEMISTRY

VALUE ADDED COURSE

MEDICAL LABORATORY TECHNIQUES

Course Credit: 2

Course Code: 20VABC1

OBJECTIVES:

- To train the students to carry out laboratory investigations accurately and provide reliable reports to facilitate proper diagnosis and prognosis of diseases
- To obtain information about the health of a patient to aid in diagnosis, treatment, and prevention of disease.
- To produce good Lab Technologists, of Skills, Competence and Integrity.

UNIT- I: Biomolecules

(5 Hours)

Cell – structure, organelles and functions. Carbohydrates, Proteins, Lipids, Nucleic acids and Vitamins – Classification, Properties and Functions. Blood – Composition and functions.

UNIT- II: Anatomy

(6 Hours)

Cardiovascular System – Structure of heart and ECG. Digestive System – Anatomy, process of Digestion of Carbohydrates, Proteins and Lipids. Renal System –Anatomy and Physiology of the kidney, Formation of Urine. Nervous system –outline of the nervous system.

UNIT- III: Microbiology

(5 Hours)

General Introduction to Microbiology- Bacteria- Classification- systematic bacteriology, Morphology- Membrane- Composition, chemical nature- Physiology of bacteria. Nutritional Requirements for the growth of microbes.

UNIT- IV: Collection of biological samples

(7 Hours)

Collection of biological samples – Blood, Urine, Faeces. Blood Grouping. Estimation of Haemoglobin. Sterilisation techniques. Staining techniques- Simple staining, Gram staining, Acid fast staining, Capsule staining and Spore staining. Preparation of culture media, Pour Plate and spread plate methods.

UNIT –V: Organ Function Test & Histopathology

(7 Hours)

Diagnosis of liver function, renal function and gastric functions. Disorder of clotting mechanism. Histopathology – Introduction, tissue processing and embedding, section cutting and problem encountered, staining, decalcification, frozen section, cytology, fine needle aspiration cytology.

Total Lecture Hours: 30

COURSE OUTCOME:

The students will be able to

1. Explain the functions of cell and structure and functions of Biomolecules
2. Describe about the Human Anatomy
3. Acquire basic knowledge of nature and structure of microorganism
4. Collect and store the clinical specimens of patients
5. Gain knowledge about the functions of various organs and histopathology

TEXT BOOK(S):

1. Satyanarayana U and Chakrapani U. 2020. Biochemistry, 5th Updated edition, Elsevier Publishers, India.
2. Deb AC. 2016. Fundamentals of Biochemistry. 7th Edition, NCBA Publishers, New Delhi.
3. Jain JL, Sunjay Jain and Nitin Jain. 2018. Fundamentals of Biochemistry. Updated Edition. 2020. S.Chand Publishers, New Delhi.
4. Jain AK. 2019. Textbook of Physiology with Free QA Physiology (2 Volume Set), 8th Edition. Arya Medical (APC) Publishers, New Delhi.
5. Vasudevan DM. 2018. Biochemistry, 9th Edition, Jaypee Brothers Medical Publishers, Chennai, Tamil Nadu.

REFERENCE BOOK(S):

1. Stryer I. 1988. Biochemistry, 2nd Edition, W.H. Freeman & Co., Publishers, New York.
2. Lehninger AL, Nelson DL and Cox MM. 2020. Principles of Biochemistry, 8th Edition, WH Freeman Publishers, New York, USA.
3. Voet D. and Voet JG. 1990. Biochemistry, 4th Edition, John Wiley & Sons Inc., Publishers, New York, USA.
4. Prescott, L.M., Harley, J.P. and Klein, D.A. 2002. Microbiology: Food and Industrial Microbiology. 5th Edition, McGraw-Hill, Boston.
5. Microbiology/ Michael J. Pelczar, Jr., E.C.S. Chan, Noel R. Krieg, with the assistance of Merna Foss Pelczar, 1986.5th ed. McGraw-Hill New York .

E-RESOURCES:

<https://www.pdfdrive.com/biochemistry-books.html>

http://www1.biologie.uni-hamburg.de/b-online /library/ biology_107/ bi107vc/ fa99/ terry/ sugars.html



HEAD

PG and Research Department of Biochemistry
Sengamala Thayaar Educational Trust
Women's College (Autonomous)
Sundarakkottai, Mannargudi - 614 016



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),**

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(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF BIOCHEMISTRY

B.Sc., BIOCHEMISTRY

VALUE ADDED COURSE

First Aid and Emergency Care

Total Ins. Hrs. : 30

Course Code : 21VABC1

OBJECTIVES

- To understand the scope of First Aid and role of First Aid
- To describe the life saving measures for an unconscious casualty
- To develop skill in giving First Aid treatment in emergencies

Unit -1: Becoming a First Aider

(6 Hours)

What is a first aider?, How to prepare yourself, Protection from infection, Dealing with a casualty, Requesting help, The use of medication, Remember your own needs. Action at emergency, Traffic accidents, Fires, Electrical incidents and Water incidents.

Unit-II: Assessing a Casualty Aider

(6 Hours)

Assessing the sick or injured, Mechanisms of injury, Primary survey, Secondary survey, Head- to-toe examination, Monitoring vital signs. Breathing and circulation, Life-saving priorities, Unconscious adult and Unconscious child.

Unit- III: Effects of heat and cold

(6 Hours)

The skin, Assessing a burn, Severe burns and scalds, Minor burns and scalds, Burns to the airway, Electrical burn, Chemical burn, Chemical burn to the eye, Flash burn to the eye, Incapacitant spray exposure, Dehydration, Sunburn.

Unit- IV: Respiratory problems

(6 Hours)

The respiratory system, Hypoxia, Airway obstruction, Choking adult, Choking child, Hanging and strangulation, Inhalation of fumes, Drowning, Hyperventilation, Asthma, Croup, Penetrating chest wound. Wounds and circulation the heart and blood vessels.

Unit-V: Techniques and Equipment removing clothing

(6 Hours)

Removing headgear, Casualty handling, First aid materials, Dressings, Cold compresses, Principles of bandaging, Roller bandages, Tubular gauze bandages, square knots, hand and foot cover, Arm sling, Elevation sling, improvised slings.

COURSE OUTCOME

The Students will be able to,

1. Understand the scope of First Aid and role of First Aid.
2. Describe the life saving measures for an unconscious casualty.
3. Describe First Aid process for the effects of heat and cold.
4. Explain First Aid management for respiratory problems.
5. Describe First Aid measures for wounds and circulation problems.

TEXT BOOK(S)

1. American college of emergency physicians, First Aid manual, 2014. 5th edition, DorlingKindersley, London.
2. Clement, Text book on First Aid & Emergency Nursing, 2013. 1st edition, JP Brothers.
3. Gupta L.C. Manual of First Aid, 2017. Jaypee Brothers Medical Publishers, India.

REFERENCE BOOK(S)

1. Philip Jevon, Emergency care and First Aid for Nurses, A practical guide, 2007. Churchill Living Stone.
2. John Ambulance, St. Andrew's Ambulance association and the British red cross society, FirstAid manual, 9th edition, Dorling Kindersley, London.
3. Harris N, First Aid and Emergency Care, 2022 2nd edition, Aitbs Publishers, India.

E-RESOURCES

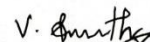
1. <https://www.ncbi.nlm.nih.gov/books/NBK222964/>
2. <https://www.webmd.com/first-aid/default.htm>
3. <https://www.indianredcross.org/publications/FA-manual.pdf>
4. <https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of-Emergency-Physicians-ACEP-First-Aid-Manual.pdf>



Head of the Department

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Course Coordinator

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DEPARTMENT OF BIOCHEMISTRY

**VALUE ADDED COURSE
Herbal Product Development**

Total Ins. Hrs. : 30

Course Code : 21VABC2

OBJECTIVES

- To know the modern extraction techniques, characterization and identification of the herbal drugs.
- To understand the preparation and development of herbal formulation.

UNIT- I: General Methods of Processing of Herbs (6 Hours)

Definition, sources, identification and authentication of herbs. Different methods of processing of herbs like collection, harvesting, garbling, packing and storage conditions. Methods of drying Natural and artificial drying methods with their merits and demerits.

UNIT- II: Methods of Preparation of Extracts (6 Hours)

Principles of extraction and selection of suitable extraction method. Different methods of extraction including maceration, percolation, hot continuous extraction, supercritical fluid extraction.

UNIT- III: Standardization of Herbal Raw materials and Extracts (6 Hours)

Standardization of herbal raw materials including Pharmacognostical, physical, chemical and biological methods with examples. Standardization of herbal extracts, physical, chemical and spectral analysis.

UNIT- IV: Selection of herbal ingredients (6 Hours)

Different dosage forms of herbal drugs. Evaluation of different dosage forms. Stability studies of herbal formulations. Good practices in collection of plant materials.

UNIT- V: Herbal Cosmetics (6 Hours)

Cosmetics preparations: Incorporating the herbal extracts in various cosmetic formulations like Skin care preparations (Creams and Lotions), Hair care preparations (Hair oils and Hair shampoos) and Beautifying preparations.(Lipsticks, Face powders and Nail polish).

COURSE OUTCOME

The Students will be able to,

1. Understand the processing of herbs
2. Acquire knowledge on procedures of preparation of extracts

3. Describe various methods on standardization of Herbs
4. Explain the selection of herbal ingredients
5. Illustrate various key ingredients and basic science to develop cosmetics

TEXT BOOK(S)

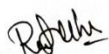
1. Choudhary, R.D. Herbal drug industry, 1st edition, 1996, eastern publisher, New Delhi:
2. Kumar, N.C. An Introduction to Medical botany and Pharmacognosy. 1993, Emkay Publications, New Delhi
3. Pulok K. Mukharjee, Quality control of herbal drugs, 1st edition, Business horizons Pharmaceutical publisher, New Delhi, 2002

REFERENCE BOOK(S)

1. Robert Verpoorte, Pulok K. Mukharjee. GMP for Botanicals - Regulatory and Quality issues on Phytomedicine Business horizons, 2003, New Delhi, First edition.
2. Kokate C.K., Purohit, Gokhale. Text book of Pharmacognosy, 1996, 4th edition, Nirali Prakashan.
3. Rao, A.P. Herbs that heal. 1999, Diamond Pocket Books (P) Ltd., New Delhi.

E-RESOURCES


1. <https://www.routledge.com/Herbal-Product-Development-Formulation-and-Applications/Sharma-Keservani-Gautam/p/book/9781774638958>
2. https://www.researchgate.net/publication/347216284_Herbal_Food_Product_Development_and_Characteristics
3. <https://www.hindawi.com/journals/ecam/2019/4935786/>
4. https://www.researchgate.net/publication/235944029_Herbal_Cosmetics_Used_for_Skin_and_Hair



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DEPARTMENT OF BIOCHEMISTRY

Semester: I-VAC-I: Biochemical Changes in Lifestyle disorders

Course Credit: 2*

Course Code: 22BCVA1

Unit-I: Human Physiology

Body fluids and their composition. Definition and differentiation of disease and disorder, types and causes. Analysis of various biochemical parameters in body fluids and specific tissues during disorders, diseases and forensics

Unit-II: Diseases and Disorders

Aetiology; classification; causative factors; incidence, symptoms and biochemical aspects and markers for- identification, monitoring, prevention and interventions. Renal disease: Nephrotic syndrome, Acute and Chronic renal failure- diagnostic procedures and dietary management. Dialysis, medical and nutrition therapy.

Unit-III: Gastrointestinal diseases/disorders

Gastro-oesophageal reflux and esophagitis, Gastritis and Peptic ulcer. Characteristics of and comparison of the stomach and duodenal ulcers. Diagnostic tests for malabsorption, sprue and tropical sprue, Crohn's disease, diarrhoea, constipation, ulcerative colitis, diverticular disease and colon cancer.

Unit-IV: Cancer and HIV/AIDS

Biochemistry of carcinogenesis, types, stages of cancer, diagnosis and existing medicines. Biochemistry of HIV infection, ART and social issues.

Unit-V: Diagnostic Techniques

Collection and storage of biological samples for clinical use. Commonly used tests for diagnosis of various diseases and their interpretation. Blood analysis: Total blood count including ESR, Total serum proteins. Blood glucose (GTT), serum lipid fraction- cholesterol, triglyceride, LDL and HDL, blood urea, and serum calcium. Urine: Creatinine, Glucose and protein. Enzymes: SGPT, SGOT and isoenzymes as markers in various disorders and diseases.

COURSE OUTCOME

The students should be able to,

1. Understand the common concepts of Biochemistry like bodyfluids and its components
2. Assess the hypo/hyper immunological reaction
3. Acquire knowledge on the basic concepts of health and disease/disorder
4. Demonstrate the connection between knowledge of anatomy and physiology and real-world situations
5. Critically evaluate on healthy lifestyle decisions and homeostatic imbalances

TEXT BOOK(S)

1. Chatterjee M N and Rana shinde, 2011. Textbook of Medical Biochemistry, 8th edition, Jaypee Publishers
2. David E. Metzler, 2001. Biochemistry- The Chemical Reactions of Living Cells, 2nd edition, Academic Press
3. Mohanty and Basu, 2002. Fundamentals of Practical Biochemistry, BI Publications
4. Eric E. Conn, Paul K. Stumpf, George Breuning, Roy H. Doi, 2009. Outlines of Biochemistry, 5th edition, John-Wiley and sons

REFERENCE BOOK(S)

1. Carl A. Burtis, Edward. Ashwood and David E. Bruns. 2011. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 5th edition, Saunders Publishers, United States.
2. Kaplan A, Jack KE, Opheim B, Toivola B and Lyon AW. 1995. Clinical Chemistry Interpretation and techniques, 4 th edition, Williams and Wilkins Publishers, United States.
3. Simon Langley-Evans. 2015. Nutrition, health and disease: A lifespan approach, 2nd edition, John Wiley & Sons Publishers, New Jersey, United States.
4. Vibha Rani, Umesh and Yadav. 2018. Functional Food and Human Health, 1st edition, Springer Publishers, New York, USA.
5. William S. Hoffman. 1964. The Biochemistry of Clinical Medicine, 3rd edition, Year Book Medical Publishers, Chennai, Tamil Nadu.

E RESOURCES

1. <https://www.slideshare.net/ImranIqbal7/metabolic-disorders-2019>
2. <https://www.slideshare.net/veerundh/veerendhar-nadh-38767743>
3. <https://drive.google.com/file/d/10C4EYN0Sv2LPI9ZzhoV->
4. <https://drive.google.com/file/d/1UyLEp6iXyKrqXuVwh->
5. <https://drive.google.com/file/d/1tghNWPYyqPiqK1R11ZzUrFwcoMiuoMa/>



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DEPARTMENT OF BIOCHEMISTRY
M.Sc., BIOCHEMISTRY

Semester: I -VAC-I – Biochemistry in Daily life
Course Credit: 2* Course Code: 22PBCVA11

UNIT –I : Introduction to Biochemistry

Biochemistry: Definition of life, different forms of life, microorganisms to human beings. Building blocks of life. Introduction to the common macro and micro constituents of unicellular and multi cellular organisms.

UNIT –II: Food and Nutrition

Importance of food for existence of life. Modes of nutrition in life forms –Comparable and contrasting features. Functional foods: Definition, development of functional foods, benefits and sources of functional foods in Indian diet. Effects of processing conditions and storage. Development of nutraceutical and functional foods.

UNIT –III: Enzymes

Introduction and essentiality to life forms. Use of enzyme in beverages- fruit juices, beer, wine, and distilleries; dairy, baking, oils and fats, plantation products, animal products. Malting and germination of grains – process, characteristics, nutritional benefits and uses. Use of enzymes in Domestic use products like detergents, Textiles and Leather industry.

UNIT –IV: Human Health and Disease

Nutrition (Health), definition, classification, food and nonfood sources. Nutraceuticals; use of nutraceuticals in traditional health sciences. Role of omega-3 fattyacids, carotenoids, dietary fiber, phytoestrogens; glucosinolates;organo-sulphur compounds in health and disease (prevention and control).

UNIT –IV: Prebiotics and Probiotics

Prebiotics and probiotics: Mechanics and usefulness ofprobiotics and prebiotics in gastrointestinal health and otherbenefits. Beneficiary microbes; prebiotic ingredients in foods;types of prebiotics and their effects on gut microbes.

COURSE OUTCOME

The students should be able to,

1. Acquire basic knowledge about Biochemistry
2. Understand the basic concepts in food, health, Disease
3. Demonstrate the usefulness and concepts of Prebiotics & Probiotics

4. Describe the types and application of enzymes.
5. Evaluate on food processing & fortification

TEXT BOOK(S)

1. Birn AE., Pillay Y & Holtz T. 2009. Textbook of international health: Global health in adynamic world, 3 rd edition, Oxford University Press Publishers, England.
2. Chakrabarty, Kaveri and Chakrabarty AS. 2019. Textbook of Nutrition in Health and Disease, 1 st edition, Springer Publishers, New York, USA.
3. Chatterjea MN and Rana Shinde. 2007. Textbook of Medical Biochemistry, 7th edition, Jaypee Brothers Publishers, Chennai, Tamil Nadu.
4. Krishna Das KV. 2013. Clinical Medicine (A Textbook of Clinical Methods and Laboratory Investigations), 4 th edition, Jaypee Brothers Medical publishers, Chennai, Tamil Nadu.
5. Seyed Mohammad Nabavi, Grazia Donofrio and Seyed Fazel Nabavi. 2020. Nutrients and Nutraceuticals for Active & Healthy Ageing, 1st edition, Springer Publishers, New York, USA.
6. Palmer T. and Bonner P. 2007. Enzymes: Biochemistry, Biotechnology, Clinical Chemistry, 2nd Edition, Horwood Publishers, United Kingdom.

REFERENCE BOOK(S)

1. Carl A. Burtis, Edward. Ashwood and David E. Bruns. 2011. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 5th edition, Saunders Publishers, United States.
2. Kaplan A, Jack KE, Opheim B, Toivola B and Lyon AW. 1995. Clinical Chemistry Interpretation and techniques, 4th edition, Williams and Wilkins Publishers, United States.
3. Simon Langley-Evans. 2015. Nutrition, health and disease: A lifespan approach, 2nd edition, John Wiley & Sons Publishers, New Jersey, United States.
4. Vibha Rani, Umesh and Yadav. 2018. Functional Food and Human Health, 1st edition, Springer Publishers, New York, USA.
5. William S. Hoffman. 1964. The Biochemistry of Clinical Medicine, 3rd edition, YearBook Medical Publishers, Chennai, Tamil Nadu.

E RESOURCES

1. https://www.researchgate.net/publication/327247966_Chapter06_Carbohydrates-III_Regulation_of_Blood_Glucose_Diabetes_Mellitus
2. <https://www.slideshare.net/ImranIqbal7/metabolic-disorders-2019>
3. <https://www.slideshare.net/veerundh/veerendhar-nadh-38767743>
4. <https://drive.google.com/file/d/10C4EYN0Sv2LPI9ZzhoV->
5. <https://drive.google.com/file/d/1UyLEp6iXyKrqXuVwh->
6. <https://drive.google.com/file/d/1tghNWPYuqPiqK1R111ZzUrFwcoMiuoMa/>
7. <https://pharmacologyonline.silae.it/files/newsletter/2009/vol3/44.Jagdish.pdf>

SENGAMALATHAYAARE EDUCATIONAL TRUST WOMEN'S COLLEGE
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SUNDARAKKOTTAI, MANNARGUDI- 614016
(For the Candidates admitted in the academic year 2022 – 2023)
DEPARTMENT OF BIOCHEMISTRY

Semester: II-VAC-II: Know Your Medicine

Course Credit: 2*

Course Code: 22BCVA2

Unit-I: Know your Medicine

Brief description of some common Dosage forms of Medicines: Tablets, Capsules, Liquids, Suspensions, Injectable, Non-oral dosage forms etc. Components of a Medicine (Dosage form). Generic and Branded medicines. Dosage strength and How to read the label of Medicines. Idea of Batch, Manufacturing and Expiry Dates.

Unit-II: Using Medicines

Buying and storing medicines at home. Concept of Dosage frequencies and its variation. Reasons for before or after food dose. Do's and Don'ts with special dosage forms (enteric or extended release etc). Do's and Don'ts on Medicines for chronic conditions such as Diabetes, Hypertension etc

Unit-III: Drugs or Medicine Discovery

Some historical perspectives of drug discovery examples such as Aspirin, Penicillin, Quinine, etc. Natural drugs to Modern drugs. Safety evaluation and Efficacy Evaluation etc. Some modern advances such as Gene Therapy, Stem cell therapy etc.

Unit-IV Herbal, Ayurvedic and Siddha Medicines

Basic concepts. Common Traditional Remedies and Illustrative examples of popular plant drugs used in the above systems of medicines, their therapeutic constituents and uses.

Unit-V: Standards, Quality and Regulation of Medicines

Basic concepts of quality with respect to medicinal products and how it is ensured. Outline of structure and functions of Drug Control and other relevant Bodies such as NPPA, Scope and purpose of Drugs and Cosmetic Act etc.

COURSE OUTCOMES

The students should be able to,

1. Explain the various dosage forms, components, categories and labelling of Medicines.
2. Gain awareness about buying, using, storing and side effects of Medicines.
3. Understand about various stages of drug development and about current therapies.
4. Appreciate the concepts of traditional medicines, standards for medicines and regulation of medicines.
5. Extract, evaluate and label the medicines.

TEXT BOOK(S)

1. Allen, 2018, Ansel's Pharmaceutical Dosage Forms And Drug Delivery System, Wolters Kluwer India Pvt. Ltd.
2. Mohantha G P, 2017, Textbook of Clinical Research, PharmaMed Press/BSP Books
3. Wallis T E, 2005, Textbook Of Pharmacognosy, CBS
4. Indian Pharmacopieia

REFERENCE BOOK(S)

1. Farooqi AA and Sreeramu B S, 2004. Cultivation of medicinal and aromatic crops. Revised edition, Universities Press (India) Private Limited, Hyderabad
2. Harbone JB, 1998. Phytochemical Methods: A guide to modern techniques of plant analysis. 3rd Edn, Springer (India) Private Limited, New Delhi.
3. WHO, 2002. Quality control methods for medicinal plant materials, World Health Organization, Geneva, A.I.T.B.S., Publishers and Distributors, New Delhi.
4. Halliwall B and Gutteridge J M. 1985. Free radicals in Biology and medicine. Oxford university press.

E RESOURCES

1. Central Drugs Standard Control Organization (CDSCO):
<https://cdsco.gov.in/opencms/opencms/en/Home/>
2. <https://pharmacologyonline.silae.it/files/newsletter/2009/vol3/44.Jagdish.pdf>



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DEPARTMENT OF BIOCHEMISTRY

B.Sc., BIOCHEMISTRY

VALUE ADDED COURSE

VAC I-Phytochemistry and Biological Activities of Medicinal Plants

Total Ins. Hrs. : 30

Course Code : U23BCVA1

Objectives

To learn about phytochemistry and biological activities of medicinal plants

UNIT-I (5 Hours)

Extraction – purification of bio-active compounds from plants – cold & hot extraction – Soxhlet extraction – crude extracts purification by various solvents.

UNIT-II (6 Hours)

Isolation of bioactive compounds – chromatographic techniques – thin layer chromatography – liquid chromatography – HPLC and UPLC.

UNIT-III (5 Hours)

Structural analysis of bioactive compounds – IR spectroscopy – Mass spectrometry – NMR spectroscopy.

UNIT-IV (7 Hours)

Herbal medicine – History of herbal medicine – different types of herbal medicine – Ayurveda, Siddha and Unani – Pharmacological action – clinical research and traditional uses of Indian medicinal plants – *Eclipta alba*, *Gymnema sylvestre*, *Ocimum sanctum*, *Curcuma longa*.

UNIT-V (7 Hours)

Phytopharmaceuticals and their health benefits – anthocyanins, carotenoids, lycopene, isoflavones, polyphenols, omega 3 - fatty acids, biological effects of resveratrol.

Course Outcomes

After completion of the course, student will

- Understand the concepts of phytochemistry
- Able to appreciate the medicinal values of plants
- Know the various techniques involved in the phytochemistry

- Familiarize the bio-active components present in the plants

Text books:

Godte V.M. 2000. Ayurvedic pharmacology and therapeutic uses of medicinal plants, Bharathiya Vidya Bhavan, Mumbai.

Grewal, R.C. 2000. Medicinal Plants, Campus Books International, New Delhi.

Harbone, J.B. 1998. Phytochemical Methods A guide to modern techniques of plant analysis, 3rd Edition. Springer (India) Private Limited, New Delhi.

Majumdar, A. 2000. Home remedies in Ayurveda, Amar Granth Publications, New Delhi.

Silverstein, R.M. and F. X. Webster.1998. Spectroscopic identification of organic compounds, John-Wiley.

Willard, H.H., L. L. Merrit and J.A. Dean, 1987. Instrumental Methods of analysis. Wadsworth Publishing, Belmont, California.



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DEPARTMENT OF BIOCHEMISTRY

M.Sc., BIOCHEMISTRY

VALUE ADDED COURSE

VAC-I - Detection Methods of Food Adulteration

Total Ins. Hrs. : 30

Course Code : P23BCVA1

Objectives:

- To exemplify different food adulterants
- To elucidate the adulterants in food products

UNIT-I Testing adulteration of Milk (6 Hours)

Test A: Adulteration of Milk Physical Tests: Detergent Test Filter Test Flow. Test B: Chemical Tests: Clot on boiling test. Test for starch in Milk Test for cane sugar in Milk Test for Buffaloes Milk in Cow's Milk Test for added colours in Milk Test for skim milk power in milk Detect the presence of added carbonates and bicarbonates in milk Test for soda in milk. Test for glucose.

UNIT-II Adulteration of Ghee (5 Hours)

Test for vegetable fat: Nitric acid test Soda ash test Valenta test Test for added alkali. Baudouin test. Analysis of butter: Test for Dalda in butter. Adulteration of Khoa: Test for starch in Khoa. Adulteration of Paneer: Presence of starch in paneer.

UNIT-III Testing adulteration of oils and fats (5 Hours)

Test for sesame oil in other oils Halphen test for cotton seed oil Hexa bromide test for linseed oil Test for added mineral oil Test for added castor oil Detection of argemone oil in other oils Test for rancidity in oils Kries test for testing quality of oil.

UNIT-IV Testing adulteration of Spices (7 Hours)

Extraction of flavour. Coriander power: Test for starch & horse dung power. Chilli powder. Test for oil soluble dyes, powdered bran, saw dust and brick powder. Turmeric Powder: Test for metanil yellow and lead chromate polish. Cloves: Test for exhausted cloves. Curry powder: Test for metallic colours

UNIT V Testing adulteration in seeds (7 Hours)

Poppy seeds: Test for Amaranths seeds. Sajeera: Test for sand, stones and other seeds. Mustard seeds: Visual examination. Pepper: Test for papaya seeds. Saffron: Detection of maize cob tendrils. Cumin seeds; Cinnamon: plant bark.

COURSE OUTCOME

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

- Understand the adulteration of common foods and their adverse impact on health
- Comprehend certain skills of detecting adulteration of common foods.
- Extend their knowledge to other kinds of adulteration, detection and remedies.

Reference Books:

Rapid detection of food adulterants and contaminants Theory and practice.
Shyam Narayan Jha. 2015



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DEPARTMENT OF BIOCHEMISTRY

B.Sc., BIOCHEMISTRY

VALUE ADDED COURSE

VAC II- Nutraceuticals

Total Ins. Hrs. : 30

Course Code : U23BCVA2

Objectives:

The main objectives of this course are to:

- To provide Basic knowledge about nutraceuticals
- To understand the health benefits of nutraceuticals
- To apply basic techniques for the production of nutraceuticals
- To give exposure to basic analytical instruments relevant to nutraceutical industries

UNIT-I

(5 Hours)

Theory: Introduction to nutraceuticals, Classification and sources of nutraceuticals. Dietary supplements, fortified foods and functional foods.

UNIT-II

(7 Hours)

Theory: Introduction to Phytonutraceutical. Classification - Plant secondary metabolites, Extraction and purification of Phytonutraceuticals.

UNIT-III

(7 Hours)

Theory: Probiotics, prebiotics, and synbiotics. Health benefits Probiotics- principle, mechanism, production technology. Role of nutraceuticals in management of health and diseases.

UNIT-IV

(5 Hours)

Extraction and quantification of polyphenols, flavonoids, saponins and alkaloids. 3 Hours

UNIT-V

(6 Hours)

Isolation and Identification of probiotic bacteria, *In-vitro* characterization of probiotics

Text Book(s)

1. L. Rapport and B. Lockwood (2002) Nutraceuticals, 2nd Edition, Pharmaceutical Press.
2. M. Maffei (Ed.) (2003) Dietary Supplements of Plant Origin, Taylor & Francis 3 Nutraceuticals by L. Rapport and B. Lockwood, Pharmaceutical Press.

Reference Book(s)

1. Israel Goldberg (Ed.) (1999) Functional foods, designer foods, pharma foods, Nutraceuticals, Aspen publishers Inc., USA
2. Shahidi and Weerasinghe (Ed.) (2004) Nutraceutical beverages Chemistry, Nutrition and health Effects, American Chemical Society
3. L. Rapport and B. Lockwood (2002) Nutraceuticals, 2nd Edition, Pharmaceutical Press.
4. M. Maffei (Ed.) (2003) Dietary Supplements of Plant Origin, Taylor & Francis

E-Resources

1. Food is Medicine - An introduction to Nutraceuticals
<https://www.researchgate.net/publication/283076818>
2. Phytopharmaceutical applications of Nutraceuticals Functional foods
https://www.researchgate.net/publication/308116783_Phytopharmaceutical_applications_of_Nutraceuticals_Functional_foods
3. Nutraceuticals, Nutritional Therapy, Phytonutrients, and Phytotherapy for Improvement of Human Health: A Perspective on Plant Biotechnology Application
iteseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.321.9494&rep=rep1&type=pdf
4. Effects of Probiotics, Prebiotics, and Synbiotics on Human Health
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5622781/pdf/nutrients-09-01021.pdf>
5. Production of High quality Probiotics by fermentation
https://www.researchgate.net/publication/280057164_Production_of_High_quality_Probiotics_by_fermentation



**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS),**

SUNDARAKKOTTAI, MANNARGUDI- 614016

(For the Candidates admitted in the academic year 2021 – 2022)

DEPARTMENT OF BIOCHEMISTRY

M.Sc., BIOCHEMISTRY

VALUE ADDED COURSE

VAC-I - Detection Methods of Food Adulteration

Total Ins. Hrs. : 30

Course Code : P23BCVA1

Objectives:

- To exemplify different food adulterants
- To elucidate the adulterants in food products

UNIT-I Testing adulteration of Milk (6 Hours)

Test A: Adulteration of Milk Physical Tests: Detergent Test Filter Test Flow. Test B: Chemical Tests: Clot on boiling test. Test for starch in Milk Test for cane sugar in Milk Test for Buffaloes Milk in Cow's Milk Test for added colours in Milk Test for skim milk power in milk Detect the presence of added carbonates and bicarbonates in milk Test for soda in milk. Test for glucose.

UNIT-II Adulteration of Ghee (5 Hours)

Test for vegetable fat: Nitric acid test Soda ash test Valenta test Test for added alkali. Baudouin test. Analysis of butter: Test for Dalda in butter. Adulteration of Khoa: Test for starch in Khoa. Adulteration of Paneer: Presence of starch in paneer.

UNIT-III Testing adulteration of oils and fats (5 Hours)

Test for sesame oil in other oils Halphen test for cotton seed oil Hexa bromide test for linseed oil Test for added mineral oil Test for added castor oil Detection of argemone oil in other oils Test for rancidity in oils Kries test for testing quality of oil.

UNIT-IV Testing adulteration of Spices (7 Hours)

Extraction of flavour. Coriander power: Test for starch & horse dung power. Chilli powder. Test for oil soluble dyes, powdered bran, saw dust and brick powder. Turmeric Powder: Test for metanil yellow and lead chromate polish. Cloves: Test for exhausted cloves. Curry powder: Test for metallic colours

UNIT V Testing adulteration in seeds (7 Hours)

Poppy seeds: Test for Amaranths seeds. Sajeera: Test for sand, stones and other seeds. Mustard seeds: Visual examination. Pepper: Test for papaya seeds. Saffron: Detection of maize cob tendrils. Cumin seeds; Cinnamon: plant bark.

COURSE OUTCOME

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

- Understand the adulteration of common foods and their adverse impact on health
- Comprehend certain skills of detecting adulteration of common foods.
- Extend their knowledge to other kinds of adulteration, detection and remedies.

Reference Books:

Rapid detection of food adulterants and contaminants Theory and practice.

Shyam Narayan Jha. 2015