Ammai Hajira Women's College

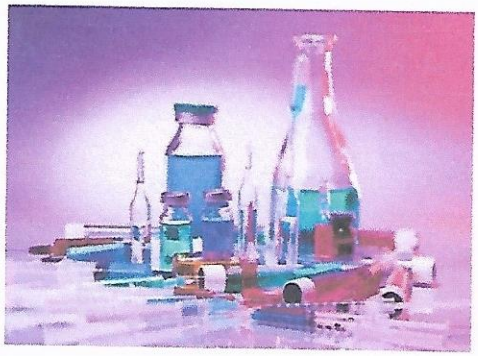
(A Unit of As-Sathiq Educational Society)
MELAPALAYAM, TIRUNELVELI – 627 005

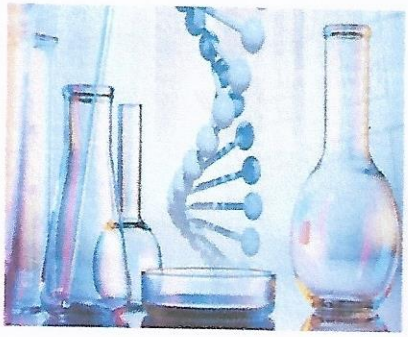
Department of Chemistry

Departmnt of Chemistry

CERTIFICATE COURSES OFFERED IN 2022-2023

- ✓ Food Science
- ✓ Emergency and Medical Lab Skills
- ✓ Applied Chemistry





Duration : 30 Hours

Eligibility: All Programme Students of UG

Scope:

Food Science

- Acquire the basic knowledge of food chemistry
- Gain informations on food additives and preservatives
- Get awareness on adulteration in various food items, its effects and preventive measures

Emergency and Medical Lab Skills

- ✓ Gain awareness on the causes and treatment of common diseases
- ✓ Acquire idea on common chemicals used in medicines
- ✓ Get information on the resources of vitamins, deficiency disease

Applied Chemistry

- Acquire knowledge about the chemicals used in day to day life
- Know about materials used for fertilizers and polymers, drugs,soaps & Detergents

Certificate Course 2022-2023
FOOD SCIENCE

About the Course

The course focuses on the importance of food, energy gained and the types of nutrients which are present in the food. It gives awareness on food additives. Also provides knowledge about Preservatives used to keep the food fresh for longer periods of time by extending shelf life and the action of preservatives against bacteria, molds, fungi, and yeasts. Effective food standards and control systems required to protect food production within the country as well as to facilitate trade with other nations can also be elaborated in the course. Adulteration which is now a greatest threat in food industries are discussed in detail. The course also provides practical understanding of food and analysing the standards and adulteration.

Pedagogical Outline

The duration of the course is 1 year which incorporates theory classes, practical classes, assignments, quizzes and internal tests.

Eligibility

All the Under Graduate students who passed higher secondary examination are eligible to enroll this course.

Scope of the Course

With the knowledge of physical properties of foods, production of novel foods, packaging, preservation, traditional/innovative process technology and nutrients of food, the students can gain in depth knowledge on food and awareness on various food processing techniques. Food science is the basic science and applied science of food; its scope starts at overlap with agricultural science and nutritional science and leads through the scientific aspects of food safety and informing the development of food technology.

Certificate Course in Food Science		
Paper – I	Course Code: 2022FSC11	
Hours: 30	Duration: 1 year	Credits: 2

COURSE OBJECTIVES

- To acquire the basic knowledge of food chemistry
- To gain information on food additives and preservatives
- To get awareness of adulteration in various food items, its effects and preventive measures
- To develop the skill in weights, measures of foods and determination of fat, protein and carbohydrate in food stuff.

COURSE CONTENT

UNIT – I INTRODUCTION **(5 Hrs)**

Food: sources and classification – food as a source of energy - functions and biological importance of carbohydrates, protein, fat, vitamins and minerals - calorific value of food – energy requirements of individuals - balanced diet.

UNIT - II FOOD ADDITIVES AND FOOD PRESERVATIVES **(5 Hrs)**

Definition, permitted food additives, characteristics and their role: food colourants: natural and artificial - antioxidants, stabilizers, flavours, sweeteners, emulsifiers, thickeners, bleaching and maturing agents – leavening agents. Definition - Classification - Methods of food preservation and processing by heat, cold, radiation, drying and deep freezing.

UNIT - III NUTRIENTS VITAMINS AND MINERALS **(5Hrs)**

Classification – functions-dietary sources-Recommended dietary allowance-fat soluble vitamins –vitamin A,D,E,K and water soluble vitamins –Thiamine , Riboflavin, Niacin, Pyridoxine, vitamin B12 and Vitamin C. Role of calcium, phosphorous, iron, sodium, potassium, iodine, fluorine and selenium.

UNIT - IV FOOD ADULTERATION **(5 Hrs)**

Definition – types – common adulterants, detection and analysis of adulterants in foods: milk, chilly powder, coffee powder, coriander powder, tea dust, asafetida, turmeric powder, ghee, honey, oil and pulses - food poisoning and its prevention – Prevention of Food Adulteration Act- food laboratories and their functions.

UNIT -V FOOD QUALITY AND STANDARDS **(5 Hrs)**

Quality control - specification and standards - FA, FDA, WHO standards – ISI specifications, packing and labelling of foods, Essential Commodities Act - Consumer Protection Act – Agricultural Produce Act (1935 grading and Marketing) AGMARK. Codex Alimentarius Commission (CAC)

LABORATORY WORK **(5 Hrs)**

- Weights & measures, standardization of common food preparation.
- Determination of fat, protein and carbohydrate in food stuff.
- Analysis of fats and oil-iodine value, acid value and RM value.
- Determination of common adulterants in food (Milk, ghee, oil, Honey, Chilly, Coriander powder, turmeric powder, coffee powder etc.).

Reference books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, New Delhi,2002.
2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd, Bangalore1993.
3. N.S. Gnanaprakasam, G. Ramamurthy, Organic Chemistry, Lab Manual, S. ViswanathanPrinters and Publishers Ltd.
4. Food Science – III Edition – B. Sri Lakshmi, New Age International Publisher, 2005.
5. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. WilleyEastern Ltd, Madras

Course Outcomes:

CO No.	*Expected Course Outcomes* *Upon completion of this course, the students will be able to:*	Cognitive Level
1	Find the source of food and list out a major food group	R
2	Summarizes the food additives and explain its significance	U/E/C
3	Explain the food preservation and function of food preservatives	E
4	Identify the adulterants available in the food	Ap
5	Examine the food and what are the food quality standard used to assess the food	E/R
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create		

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Department of Chemistry

DEPARTMENT OF CHEMISTRY

Certificate Course 2022-2023

EMERGENCY AND MEDICAL LAB SKILLS

About the Course

The course introduces basic emergency medical care to the students. This course is about providing First Aid for accidents, cuts, bruises, bleeding, fractures, burns, fainting and poisonous bites with the principal goal of improving quality of care and patient safety. Students will be well prepared to improve them in life-saving procedures.

Pedagogical Outline

The duration of the course is 1 year which incorporates theory classes and quiz.

Eligibility

All the Under Graduate students who passed higher secondary examination are eligible to enroll this course.

Scope of the Course

With the knowledge of Emergency and Medical Lab Skills, students will gain the awareness on the causes and treatment of some common diseases. The students will get an idea on the common chemicals used in various medicines. They can gain information on various resources of vitamins, deficiency diseases and the ways to improve immunity by the intake of nutrients.

Certificate Course in Emergency and Medical Lab Skills		
Paper – II	Course Code: 2022EML12	
Hours: 30	Duration: 1 year	Credits: 2

COURSE OBJECTIVES

- ✓ To have knowledge of first aid and the important rules.
- ✓ To know the common chemicals in medicine
- ✓ To have awareness of common diseases
- ✓ To learn the diagnostic tests and to know the importance of vitamins

COURSE CONTENT

Unit- I: FIRST AID **(6 Hrs)**

First Aid for accidents - important rules - first aid kit, First aid for cuts, bruises, bleeding, fractures, burns, fainting and poisonous bites. Common poisons - Acid poisoning antidote, Alkali poisoning-antidote, Poisoning by disinfectant – symptoms - antidote, Alkaloid poisoning – symptoms - antidote, alcohol poisoning – symptoms - antidote, Mercury poisoning antidote and Salicylate poisoning-antidote.

Unit-II: CHEMICALS IN MEDICINE **(5 Hrs)**

Preparations and chemical equations not required) Alum-properties and uses, Aluminium hydroxide gel-uses-Dried Aluminium hydroxide gel-uses-Aluminium acetate-uses, Ferrous fumarate-uses-Ferrric ammonium citrate-uses. Ferrous gluconate-uses, Ferrous sulphate. Biological importance of sodium, potassium, calcium, Iodine and copper.

Unit-III: CAUSES AND TREATMENT OF SOME COMMON DISEASES **(6 Hrs)**

Insect borne diseases – malaria and filariasis Prevention and treatment. Air borne diseases – diphtheria, whooping cough, influenza, measles, mumps, common cold, tuberculosis and leprosy- Prevention and treatment. Water borne – cholera, typhoid and diarrhoeal diseases - Prevention and treatment. Respiratory disorder – Prevention and treatment of asthma. Nervous disorder – epilepsy—Prevention and treatment - other diseases – Peptic ulcer- treatment.

Unit- IV: CLINICAL CHEMISTRY **(5 Hrs)**

Clinical chemistry – Composition of blood – blood grouping - determination of blood groups and matching – blood pressure – hypertension. Folin and Wu's method – Sackett's method – tests for cholesterol – determination of serum cholesterol – Diagnostic test for sugar in urine, Estimation of glucose in urine – Benedict's test – Clinistix-strip test, Diagnostic test for salts in urine and serum. Detection of diabetes, detection of anaemia. Estimation of red blood cells, Normal RBC count in adults.

Unit V: HEALTH CARE MEDICINES **(3 Hrs)**

Vitamins-Classification of Vitamins-Sources- deficiency diseases of Vitamins A, D, E, K, B_1, B_2, B_3, B_6, B_{12} and C –Therapeutic uses. Treatment of ulcers and skin diseases.

Laboratory Work **(5 Hrs)**

- Determination of glucose in serum
- Estimation of hemoglobin (Hb concentration)
- Determination of blood pressure

References

1. Practical Biochemistry – David Plummer – 2005, Tata McGraw-Hills Publishing Company.
2. Text Book of Pharmaceutical Chemistry – Jeyashree Gosh – 2003, S.Chand and Company, New Dehi.
3. Medicinal Chemistry – G.R.Chatwal, 2002, Himalaya Publishing House, New Delhi.
4. Medical Lab Technology- Praful B. Godkar
5. Clinical Laboratory methods - Jolm D. Bener
6. Medical Lab Technology - Ramniksood
7. Clinical chemistry in Diagnosis and Treatment, Ziwal.F.P. Peter, Mayne P.D.
8. Practical clinical Biochemistry- Verley publications, W. H. Heinemann
9. Medical Lab Technology (Vol I-III)- Kanai L. Mukherjee
10. Clinical Diagnosis by Laboratory Examination John A. Kokmmer.
11. Clinical Lab Methods & Diagnosis Vol- Alex C.S.L.Garelt.
12. A New short Text Book of Microbial & Parasitic Infections - B.T. Duerden.

Course Outcomes:

CO No.	*Expected Course Outcomes* *Upon completion of this course, the students will be able to:*	Cognitive Level
1	Know about the first aids, poisoning and antidotes to be given.	R/U/Ap
2	Understand the biological importance of elements like Sodium, Potassium, Calcium etc.	U/Ap
3	Causes and treatment of common diseases, Differentiate between air borne, water borne and insect borne diseases	U/Ap
4	Estimate the glucose in urine, detection of anaemia	An/E
5	Understand vitamins and their deficiency diseases. Develop the skill of treatment of ulcers	U/Ap/E
6	Laboratory work – determination of glucose, Bp and Hb	Ap
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create		

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DEPARTMENT OF CHEMISTRY

Certificate Course 2022-2023

APPLIED CHEMISTRY

About Course

The field of applied chemistry focuses on applying the theories and principles of chemistry to practical problems, finding out the chemical properties of materials, and developing new materials. The Course covers a variety of chemical fields, working on various materials including inorganic and organic pesticides, polymers, chemicals in pharmacy and their applications. Applied chemistry provides essential chemistry knowledge to the students on day-to-day life chemicals.

Pedagogical Outline

The duration of the course is 1 year which incorporates theory classes, assignments, quizzes and internal tests.

Eligibility

All the Under Graduate students who passed higher secondary examination are eligible to enroll this course.

Scope of the Course

There is a wealth of opportunities available to people who are interested in knowing what is applied chemistry and how to further one's career in it. By studying Applied Chemistry, students can pursue a career in the following fields.

- Soaps And Detergents
- Fertilizers
- Polymers
- Chemicals In Pharmacy
- Chemicals In Day-To-Day Life

This course provides numerous job opportunities in a variety of industries that utilize Chemistry in a real-life setting in some way or another.

Certificate Course in Applied Chemistry		
Paper – III	**Course Code: 2022ACH13**	
Hours: 30	**Duration: 1 year**	**Credits: 2**

COURSE OBJECTIVES

- ✓ The course aims at elucidating principles of applied chemistry in, Soaps and Detergents, Fertilizers, Polymers, Chemicals in Pharmacy, Chemicals in Day-To-Day Life analytical techniques.
- ✓ The students will be able to understand the preparation and uses of the Soaps and Detergents
- ✓ To provide students with skills and knowledge in characteristics of a good fertilizer and bad fertilizers
- ✓ The exposure to this course would facilitate the students in understanding the terms Analgesics, Hematinic, Antibiotic, Laxatives.
- ✓ On completion of this course, the students will be able to identified chemicals used in everyday life

COURSE CONTENT

UNIT I - SOAPS AND DETERGENTS **(6 Hrs)**

Soaps: Definition-classification-raw materials used in the manufacture of soap – manufacture of toilet soap. Detergents: Definition –various types with examples-advantages of detergents over soaps – cleansing action of soap.

UNIT II- FERTILIZERS **(6 Hrs)**

Definition-characteristics of a good fertilizer- role of nitrogen, potassium and phosphorous in plant growth – natural fertilizers- chemical fertilizers: urea, muriate of potash and triple superphosphate - mixed fertilizers - biofertilizers – advantages of biofertilizers.

UNIT III – POLYMERS **(6 Hrs)**

Fibers: Classification –uses of terylene, nylon and orlon. Resins: Natural resins synthetic resins - type-uses of fevicol, quick fix, araldite, glyptal andBakelite. Plastics: classification-differences between thermoplasts and thermosets. Advantages of plastics - uses of polythene, PVC, polystyrene, Teflon and thermocole. Rubber: Types-defects in natural rubber-vulcanization-synthetic rubbers- uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

UNIT IV - CHEMICALS IN PHARMACY **(6 Hrs)**

Definition and therapeutic uses of the following (an elementary study only) Antiseptics: alum, boric acid, Mouth washes: Hydrogen peroxide Antacids: Aluminum hydroxide Analgesics: Aspirin, paracetamol Antibiotics: Penicillin, tetracyclines. Haematinics: Ferrous fumerate, ferrous gluconate Laxatives: Epsom salt, milk of magnesia -Sedatives: Diazepam

UNIT V - CHEMICALS IN DAY-TO-DAY LIFE **(6 Hrs)**

An outline of the preparation and uses of the following articles.

Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls.

References:

1.B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.

2.Jeyashree Gosh, A text book of Pharmaceutical Chemistry, S. Chand and Company, New Delhi.

3.B. N. Chakrabarty, Industrial Chemistry,Oxford and IBH Publishing Co.Pvt.Ltd.,Calcutta.

Course Outcomes:

CO No.	*Expected Course Outcomes* *Upon completion of this course, the students will be able to*:	Cognitive Level
1	Discuss the definition-classification-raw materials used in the manufacture of soap –manufacture of toilet soap	U / C / Ap
2	Shorten the preparation of fertilizer and explain the advantages of biofertilizers	U / C / Ap
3	Simplify the preparation of polymers and uses	U / C / Ap
4	Briefly discuss therapeutic uses of the pharmaceutical chemicals	U / Ap /An
5	Describe the outline of the preparation and uses of the some chemicals in everyday life	U / C / Ap/An

Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create