ESTD :1960

Phone : (02774) 246410

શ્રી મ. લા. ગાંધી ઉચ્ચતર કેળવણી મંડળ, મોડાસા સંચાલિત

સર પી. ટી. સાયન્સ કૉલેજ, મોડાસા

હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી, પાટણ સંલગ્ન

The M.L.Gandhi Higher Education Society, Modasa Managed

Sir P. T. Science College, Modasa

Affiliated to Hemchandracharya North Gujarat University, Patan

Accredited by B++ by NAAC & A Grade by KCG, GOG

પો.બો.નં.૦૧, કૉલેજ કેમ્પસ, મોડાસા-૩૮૩ ૩૧૫, જિ. અરવલ્લી (ગુજરાત)

P.B. No. 01, College Campus, MODASA-383 315, Dist-Arvalli (Gujarat)

Website : www.sirptsciencecollege.org
E-mail: sirptscience127@gmail.com

College Code No. : 32 / HNGU Code : 008
AISHE Code : C-6635

Grant Code No. : 127
Zone Code No. : 93

Ref. No.

Date : / /20

Broachers/Notice of Add on Certification course offered by Institute

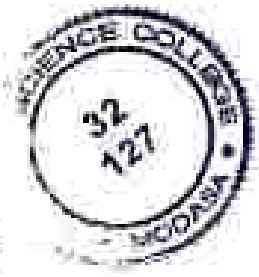
Academic Year 2018-2024

1	Add on course on Basic Knowledge of Computer
2	Add on Course on Medicinal and aromatic plants
3	Add on course on Fundamentals of Computer
4	Add on course on Electric Circuit Analysis
5	Add on course on Mahemetica Software
6	Add on course on Electronics Instrument and Circuit
7	Add on course on Optical Instruments
8	Add on course on Instrumentation Techniques in physical Chemistry
9	Add on course on Phenyl Making
10	Add on course on Manufacturing Soap and detergent
11	Add on course on Manufacturing of synthetic dye
12	Add on course on Data Interpretation of unknown Compound through NMR
13	Add on course on Water Quality
14	Add on course on Ethno botany and Medical Plant
15	Add on course on Scientific Research Paper Writing
16	Add on course on Fundamentals of Computer
17	Add on course on Nano satellite design
18	Add on course on Mathematics for competitive exams
19	Add on course on Basic mathematics aptitude
20	Add on course on Quantitative Aptitude Skill
21	Add on course on Basics of Vedic Mathematics
22	Add on course on An Introduction to Python
23	Add on course on micro Biostatistics
24	Add on course on micro Drinking water.
25	Add on course on micro hematology.
26	Add on course on Micro plant pathology
27	Add on course on micro Research Methodology
28	Add on course on micro Biophysical Technique.
29	Add on course on Kitchen Gardening and compositing
30	Add on Course on Estimation Of Glucose Present In Different Fruits And In Candy
31	Add on Course on IN Environmental law and policy
32	Add on Course on Mushroom Cultivation
33	Add on Course on Modern Biotechnologies for Wastewater Treatment
34	Add on course on Soap & Detergent
35	Add on Course on Food Adulteration
36	Add on Course on Water Analysis of Modasa Taluka
37	Add on Course on FOOD TECHNOLOGY
38	Add on Course on ENVIRONMENT STUIDES
39	Add on Course on Biodiversity and Forest Conservation
40	Add on Course on HERBARIUM TECHNIQUES & METHODOLOGY
41	Add on Course on Microsoft Office Excel Tool Use In Mathematical Research
42	Add on Course on Microsoft Office Excel Tool Use In Mathematical Research-I
43	Add on Course on Microsoft Office Excel Tool Use In Mathematical Research-II
44	Ethno botany and Medical Plant
45	Scientific Research Paper Writing
46	Basic Electronics Training
47	LED Bulb Uses and Application

Date: 30/4/2024

SIR P. T. SCIENCE COLLEGE 32 127 MODASA

Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli.



SIR P T SCIENCE COLLEGE, MODASA

SYLLABUS

FOR

ADD-ON COURSE

IN

ETHNOBOTANY AND MEDICINAL PLANTS

(Effective from the Academic Session 2022-23)

DEPARTMENT OF BOTANY

SIR P T SCIENCE COLLEGE, MODASA

OBJECTIVES OF THE COURSE:

Introduction to Ethnobotany and medicinal plants explores the fundamental relationships that exist between plants and indigenous/traditional cultures from around the world. The course presents the history of indigenous/traditional plant use in relation to cultural development as well as how modern scientific approaches to ethnobotanical investigation are revealing new and exciting applications for plant materials. It also provides information on various categories of plant use, the importance of traditional knowledge in Western culture, and the role of plant conservation and cultural sustainability. Thus, this course will enable the students to -

- Know about the traditional knowledge of plants and their uses especially theirroles in curing various human diseases
- Acquire knowledge on various types of drug preparation
- Study certain important plants involved in home remedies
- Understand the importance of preservation and conservation of indigenous medicinal plants.

SIR P.T.SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on 05-07-2022 prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in this meeting.

The attached syllabus of 30 hours **"ADD ON COURSE ON: "ETHANOBOTANY AND MEDICINAL PLANT-2022-23** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.FUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. M S JANGID	Associate Professor	
7	Dr. H S KHARADI	Associate Professor	
8	Dr. U C GUPTA	Assistant Professor	

ADD-ON COURSE IN ETHNOBOTANY AND MEDICINAL PLANTS

(Effective from the Academic Session 2022-23)

DEPARTMENT OF BOTANY

SIR P T SCIENCE COLLEGE, MODASA

Date: 01/12/22 TO 31/01/23

Syllabus contents (30 hours)

Units	Course contents (Theory)	Class/Lectures
1	Introduction and objective of Ethnobotany; Ethnobotanyis an interdisciplinary science; The relevance of ethnobotany in the present context	02 hours
2	Some common ethnic groups or Tribals of India andtheir life styles; Plants used by the Tribals: a) Food plants b) Medicines and miscellaneous uses	02 hours
3	Role of ethno botanical practices in modern medicine with example of some common medicinal plants	01 hours
4	Biopiracy, Intellectual property rights and traditional knowledge	01 hours
5	History, Scope and importance of medicinal plants with some common examples; Application of natural products to certain common diseases	01 hours
6	Conservation of medicinal plants	01 hours
	Total no. of lectures	08 hours

* Duration of 01 class/lecture = 01 hour.

Practical/Field study	
1	Study of medicinal plants in the locality/botanical garden. (15+7= 22 hours)

APPROVED SYLLABUS OF ADD-ON COURSE IN

ETHNOBOTANY AND MEDICINAL PLANTS-2022-23

PREPARED BY
DEPARTMENT OF BOTANY

COURSE CO-ORDINATOR: DR M S JANGID
YEAR: 2022-23

SIR P T SCIENCE COLLEGE, MODASA
Date: 01/12/22 TO 31/01/23

Syllabus contents (30 hours)

Units	Course contents (Theory)	Class/Lectures
1	Introduction and objective of Ethnobotany; Ethnobotanyas an interdisciplinary science; The relevance of ethnobotany in the present context	02 hours
2	Some common ethnic groups or Tribals of India andtheir life styles; Plants used by the Tribals: a) Food plants b) Medicines and miscellaneous uses	02 hours
3	Role of ethno botanical practices in modern medicine with example of some common medicinal plants	01 hours
4	Biopiracy, Intellectual property rights and traditional knowledge	01 hours
5	History, Scope and importance of medicinal plants with some common examples; Application of natural products to certain common diseases	01 hours
6	Conservation of medicinal plants	01 hours
	Total no. of lectures	08 hours

* **Duration of 01 class/lecture = 01 hour.**

	Practical/Field study
1	Study of medicinal plants in the locality/botanical garden. (15+7= 22 hours)

REFRENCES:

JAIN, S.K. (1987). A MANUAL OF ETHNOBOTANY. SCIENTIFIC PUBLISHERS, JODHPUR.

JAIN, S.K. (1989). CONRIBULION TO INDIAN ETHNOBOTANY. SCIENTIFIC PUBLISHERS, JODHPUR.

JAIN, S.K. (1989). METHODS AND APPROACHES IN ETHNOBOTANY. SOCIETYOF ETHNOBOTANISTS, LUCKNOW.

JAIN, S.K. (1992). DICTIONARY OF INDIAN FOLK MEDICINE AND ETHNOBOTANY, DEEP PUBLICATION, NEW DELHI.

JAIN, S.K. (1996). MEDICINAL PLANTS NBT, NEW DELHI.

JAIN, S.K. (1991). DICTIONARY OF INDIAN FOLK-MEDICINE AND ETHNOBOTANY.DEEP PUBLICATION, NEW DELHI.

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Affiliated to Hemchandracharya North Gujarat University, Patan, Gujarat.

ADD-ON COURSE

FOR

B.Sc. DEGREE STUDENTS

IN

KITCHEN GARDENING & COMPOSTING

(Effective from the Academic Session 2023-24)

DEPARTMENT OF BOTANY

Dr. H. S. Kharadi
Course Coordinator

Dr. S. D. Vediya
HOD, Dept. of Botany

Dr. K.P.PATEL
Principal

SIR P. T. SCIENCE COLLEGE, MODASA

ADD-ON COURSE

FOR

B.Sc. DEGREE STUDENTS

SYLLABUS FOR ADD-ON COURSE

IN

KITCHEN GARDENING & COMPOSTING

(Effective from the Academic Session 2023-24)

DEPARTMENT OF BOTANY

SIR P T SCIENCE COLLEGE, MODASA

DEPARTMENT OF BOTANY

DETAILS OF ADD ON COURSES

SR NO	ADD ON COURSES	PERIOD OF TIME	CO-ORDINATUR	STUDENT NO OF REGISTER
YEAR:2021-2022				
1	WATER QUALITY	02/09/21 TO 30/09/21	DR. S D. VEDIYA	05
YEAR:2022-2023				
2	ETHANOBOTANY AND MEDICINAL PLANT	01/12/22 TO 31/01/23	DR. M S. JANGID	09
YEAR:2023-2024				
3	KITCHEN GARDENING AND COMPOSTING	07/12/23 TO 04/01/24	DR. H S. KHARADI	06
4	SCIENTIFIC RESEARCH PAPER WRITING	01/12/22 TO 31/01/23	DR. U C. GUPTA	05
5	MEDICINAL AND AROMATIC PLANTS	07/12/23 TO 04/01/24	PROF. A Z. CHAUDHARI	05

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Sir P. T. Science College, Modasa
Ad on Course Module
2023-24

Day	Date	Theory	Practical	Project	Total Hours
Thursday	7/12/23 14/12/23 21/12/23 28/12/23	10.00am to 11.00am 1hour/day	-----	------	4 hours Theory
Friday	8/12/23 15/12/23 22/12/23 29/12/23	10.00am to 11.00am 1hour/day	------	-------	4 hours Theory
Saturday	9/12/23 16/12/23 23/12/23 30/12/23	-------	----------	At Your Place 2hours/day	7hours Practical + 1Hours Compilation
Sunday	10/12/23 17/12/23 24/12/23 31/12/23	-------	9.00 am to 1.00pm 4hours/day	------	15 Hours Field work + 1Hours Project Reporting
Exam Schedule					
4/1/2024	2 hours	MCQ Test	Project Report Submission Presentation		Viva-voce

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SIR P. T. SCIENCE COLLEGE 32 127 MODASA

SIR P.T.SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on 15-06-2023 prepare the syllabus of add on course by Botany Department to be started in the college. The following members were present in this meeting.
The attached syllabus of 30 hours **"ADD ON COURSE ON: "KITCHEN GARDENING AND COMPOSTING -2023-24** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.FUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. M S JANGID	Associate Professor	
7	Dr. H S KHARADI	Associate Professor	
8	Dr. U C GUPTA	Assistant Professor	
9	Prof. A . Z CHAUDHARI	Assistant Professor	

Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli.

SIR P T SCIENCE COLLEGE, MODASA

DEPARTMENT OF BOTANY

KITCHEN GARDENING & COMPOSTING

OBJECTIVES OF THE COURSE:

For curious hearts, kitchen gardening isn't the same as regular gardening. This is because a kitchen garden is usually smaller and aesthetically more pleasing and can be managed exceptionally well under proper guidance. Besides, the production is meant for our fresh consumption. Conducive to growing vegetables, herbs, and fruits, kitchen gardens are more practical and more accessible to all age groups who are attached to nature. Kitchen farming promotes better health in urban areas. It is pleasure to harvest vegetables on windows, balconies, and vertical walls; any such space can be used for a vertical garden.

Composting organic waste from your kitchen and garden is an effective way to reduce waste, improve soil quality, and create a free, natural fertilizer. Composting is a simple process that anyone can do at home, and it can significantly reduce your environmental impact while promoting sustainable living. Thus, this course will enable the students to –

- To increase production and productivity of fruit/ vegetable/ spices
- To establish nurseries both at public & private sector for quality planting materials
- Composting organic waste from your kitchen and garden is an effective way to reduce waste, improve soil quality, and create a free, natural fertilizer
- To transfer technologies from Lab to Land Encourages healthy and clean eating.
- To ensure good Soil health.
- To improve internal efficiency/ responsiveness/ service delivery of the department
- To emphasize the importance of planting a garden and Concept of kitchen garden
- How to nurture a kitchen garden and Starting and maintaining a composting bin

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ADD-ON COURSE IN KITCHEN GARDENING & COMPOSTING

(Effective from the Academic Session 2023-24)
DEPARTMENT OF BOTANY
SIR P T SCIENCE COLLEGE, MODASA
Date: 07/12/22 TO 04/01/24

Syllabus contents

1	**Gardening and composting (6 Hours)** Introduction and objective of kitchen gardening and composting Cut Flowers and flower trade. Cultivation, harvesting, storage, packaging and marketing of flowers –rose, orchid, jasmine.	06
2	**Flower arrangement (6 Hours)** Flower arrangement, flower making and dry flower decorations	06
3	**Vegetative Propagation (6 Hours)** Vegetative propagation- Cutting, Layering, Budding and Grafting application and advantages, Theoretical aspects of Grafting and budding, seed propagation- seed bed preparation,	06
4	**Gardening (6hours) (** Ornamental garden, indoor garden, Outdoor Garden, landscape garden, Japanese garden, roof top garden, kitchen garden, rock garden, water garden and growing medicinal and aromaticplants.	06
5	**Garden Components (6 Hours)** Annuals, biennials, herbs, shrubs, trees, climbers, drives, arches, pergolas, flower beds, hedges, edges, Lawn, Bonsai, Water Garden / Sunken Garden, Garden friends Honey bees, ladybirds, frogs, earthworms,. Garden foes- pests, pathogenic fungi, bacteria, virus.	06
	Total no. of lectures	**30**

Principal
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Modasa-383315,Dist.Arvalli.

APPROVED SYLLABUS OF ADD-ON COURSE IN

KITCHEN GARDENING & COMPOSTING 2023-24

PREPARED BY
DEPARTMENT OF BOTANY

COURSE CO-ORDINATOR: DR H.S KHARADI
YEAR: 2023-24

SIR P T SCIENCE COLLEGE, MODASA
Date: 07/12/22 TO 4/01/24

Syllabus contents

Unit		Lectures Required
1	**Gardening and composting (6 Hours)** Introduction and objective of kitchen gardening and composting Cut Flowers and flower trade. Cultivation, harvesting, storage, packaging and marketing of flowers –rose, orchid, jasmine.	06
2	**Flower arrangement (6 Hours)** Flower arrangement, flower making and dry flower decorations	06
3	**Vegetative Propagation (6 Hours)** Vegetative propagation- Cutting, Layering, Budding and Grafting application and advantages, Theoretical aspects of Grafting and budding, seed propagation- seed bed preparation,	06
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	Total no. of lectures	**30**

Principal
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Modasa-383315, Dist.Arvalli.

Examination pattern:

1. Multiple Choice Questions – 10 marks
2. Viva voce – 10 marks
3. Study report – 15 marks
4. Present : - 05

Total Marks: 40

Gradation pattern:

Percentage	Grade
90-100	Excellent - A
70-89	Good - B
50-69	Fair - C
40-49	Not Eligible for Certificate - D

CERTIFICATE WILL BE PROVIDED BY THE COLLEGE AFTER COMPLETION OFCOURSE.

Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli

References : -

[5] Chiemela F. Anyanwu, Serafin L. Ngohayon, Ricardo L. Ildefonso, Joseph L. Ngohayon "Application of Indigenous Microorganisms (IMO) for Bio-Conversion of Agricultural Waste" International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064

[1] Malabasari R.T. and Hiremath U.S. (2016) J Farm Sci., 29(2), 251- 256.

[2] Sethy S., Sarkar S. and Kumar M. (2010) Ind. Res. J. Ext. Edu., 10 (2),89-92.

[6] Shaheb MR, Nazrul MISarker A. 2014. Improvement of livelihood, food and nutrition security through homestead vegetables production and fruit tree management in bangladesh. J Bangladesh Agric Univ. 12:377–387.

[3] Sharma K., Singh G., Dhaliwal N.S. and Yadav V.P.S. (2011) J. Comm Mobilization and Sus. Dev., 6(1), 096-099.

[4] Singh P., Pandey A., Tiwari C. and Sharma D. (2016) J. Rural Dev., 35(4), 80-83

[1] Siti Aminah Ab Muttalib, Sharifah Norkhadijah Syed Ismail, Sarva Mangala Praveena "Application of Effective Microorganism (EM) in Food Waste Composting: A review" Asia Pacific Environmental and Occupational Health Journal, 2 (2): 37 - 47, 2016 [

[8] "From kitchen gardens to perfect health: women bring a real 'Iron revolution' in 26 villages" by SnehlataShrivastav (2013), Nagpur.

[7] T.W.Bandara"The modern trends and distribution pattern of kitchen garden in Sri Lanka. A case study in Biyagama area, Page no: 27-58, ejournal- Vol 02.

[5] Vani Bhushanam G. and Usha Rani M. (2013) Am. Int. J. Res. in Formal, Applied & Natural Sci., 3(1), 78-81.

Principal
Sir P. T. Science College
Modasa-383315,Dist.Aravalli.

ADD-ON

CERTIFICATE COURSE

IN

MUSHROOM CULTIVATION

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name:** MUSHROOM CULTIVATION
- **Course Code:** 22UGMICRO6
- **Course Duration:** 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:10**
- **Aim and Objective:** Enable the students to identify edible and poisonous mushrooms

Provide hands on training for the preparation of bed for mushroom cultivation and spawnproduction

Give the students exposure to the experiences of experts and functioning mushroomfarms

Help the students to learn a means of self employment and income generation

- **Course Description:** By successfully completing the course, students will be able to:

Identify edible types of mushroom

Gain the knowledge of cultivation of different types of edible mushroomsand spawnproduction

Manage the diseases and pests of mushrooms

Learn a means of self-employment and income generation

- **Details of course:**

Paper	Total Marks	Passing Marks
MUSHROOM CULTIVATION	**100 marks mcq based test**	**40 marks**

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

" MUSHROOM CULTIVATION"

Prepared by
Department of Microbiology
Sir P. T. Science College, Modasa
Course Co-Ordinator:PROF.H.M.PATEL

Year: 2022-23

DATE:27-02-22 to 25-03-23

(For the all UG students admitted from the academic year 2022-2023)

Course Code: 22UGMICRO6

Course Duration: 30 Hours

UNIT 1: Introduction to mushrooms (2 hours)

Mushrooms -Taxonomical rank -History and Scope of mushroom cultivation – Edible and Poisonous Mushrooms-Vegetative characters

UNIT 2: Common edible mushrooms (2 Hours)

Button mushroom (*Agaricus bisporus*), Milky mushroom (*Calocybe indica*), Oyster mushroom (*Pleurotus sajorcaju*) and paddy straw mushroom (*Volvariella volvacea*).

UNIT 3: Principles of mushroom cultivation (8 Hours)

Structure and construction of mushroom house. Sterilization of substrates. Spawn production - culture media preparation- production of pure culture, mother spawn, and multiplication of spawn. Composting technology, mushroom bed preparation, Spawning, spawn running, harvesting. Cultivation of oyster and paddy straw mushroom.Problems in cultivation - diseases, pests and nematodes, weed moulds and their management strategies.

UNIT 4:Health benefits of mushrooms(2 Hours)

Nutritional and medicinal values of mushrooms. Therapeutic aspects and mode of effect

UNIT 5:Post harvest technology: (4 Hours)

Preservation of mushrooms – freezing, dry freezing, drying, canning, quality assurance and entrepreneurship.Value added products of mushrooms.

References

1. Marimuthu, T. et al. (1991). Oyster Mushroom. Department of Plant Pathology, Tamil NaduAgricultural University, Coimbatore.

2. Nita Bhal. (2000). Handbook on Mushrooms, 2nd ed. Vol. I and II. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi

3. Pandey R.K, S. K Ghosh, 1996. A Hand Book on Mushroom Cultivation. Emkey Publications.

4. Pathak, V. N. and Yadav, N. (1998). Mushroom Production and Processing Technology Agrobios, Jodhpur.

5.Tewari Pankaj Kapoor, S. C. (1988). Mushroom Cultivation. Mittal Publication, New Delhi.

6. Tripathi, D.P. (2005) Mushroom Cultivation. Oxford & IBH Publishing Co. PVT.LTD, NewDelhi.

7. V.N. Pathak, Nagendra Yadav and Maneesha Gaur, Mushroom Production and ProcessingTechnology/ Vedams Ebooks Pvt Ltd., New Delhi (2000)

UNIT 4:Health benefits of mushrooms(2 Hours)

Nutritional and medicinal values of mushrooms. Therapeutic aspects- antitumor effect

UNIT 5:Post harvest technology: (4 Hours)

Preservation of mushrooms – freezing, dry freezing, drying, canning, quality assurance andentrepreneurship Value added products of mushrooms.

References

1. Marimuthu, T. et al. (1991). Oster Mushroom. Department of Plant Pathology, Tamil NaduAgricultural University, Coimbatore.

2. Nita Bhal. (2000). Handbook on Mushrooms. 2nd ed. Vol. I and II. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.

3. Pandey R.K, S. K Ghosh, 1996. A Hand Book on Mushroom Cultivation, Emkey Publications.

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6. Tripathi, D.P. (2005) Mushroom Cultivation, Oxford & IBH Publishing Co. PVT.LTD, NewDelhi.

7. V.N. Pathak, Nagendra Yadav and Maneesha Gaur, Mushroom Production and ProcessingTechnology/ Vedams Ebooks Pvt Ltd., New Delhi (2000)

ADD-ON

CERTIFICATE COURSE

IN

Modern Biotechnologies for Wastewater Treatment

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name: Modern Biotechnologies for Wastewater Treatment**
- **Course Code:** 22UGMICROS
- **Course Duration:** 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:15**
- **Aim and Objective:** Modern biotechnologies have been widely used in clinical diagnosis, food production, and the pharmaceutical industry. Their applications in wastewater treatment have greatly improved the accuracy and efficiency of characterizing biological systems in biological wastewater treatment plants and the natural environment.
- **Course Description:** This course is designed for graduate students and working professionals who would like to learn modern biotechnologies in wastewater treatment and how to apply these biotechnologies to understand, characterize, and optimize wastewater treatment systems and plants. At the end of the course, students are expected to understand modern biotechnologies and their applications in wastewater treatment, select appropriate biotechniques to understand, characterize, and optimize wastewater treatment systems, and assess public health risks associated with antibiotic resistant bacteria and viruses in wastewater.
- **Details of course:**

Paper	Total Marks	Passing Marks
Modern Biotechnologies for Wastewater Treatment	**100 marks mcq based test**	**40 marks**

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

" Modern Biotechnologies for Wastewater Treatment"

Prepared by

Department of Microbiology

Sir P. T. Science College, Modasa

Course Co-Ordinator:DR.K.K.PATEL

Year: 2022-23

DATE:30-12-22 to 27-01-23

(For the all UG students admitted from the academic year 2022-2023)

Course Code: 22UGMICROS

Course Duration: 30 Hours

Unit 1:

- Introduction of Microbiology
- Fields of Microbiology
- Microbe Types and Metabolic Lifestyles

Unit 2:

- Electron Donor and Acceptor
- Stoichiometry and Half-reactions
- Free Energy
- Cell Synthesis
- Developing Overall Stoichiometric Equations

Unit 3:

- Membrane Filtration
- Membrane Filtration Challenges
- Microbial Aggregation and Biofilm
- Biofouling and Control

Unit 4:

- Molecular Ecology Study
- Microbial Community Analysis
- Activity Assays and FAME
- Fluorescence in situ Hybridization
- Molecular Microbiology Tools

Unit 5:

- Antibiotics
- Antibiotic Resistance
- Horizontal Gene Transfer
- Evolution and Selfish Gene
- Viruses

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REFERENCE BOOKS

- Environmental Biotechnology: Principles and Applications" by Bruce Rittmann and Perry McCarty.
- "Wastewater Microbiology" by Gabriel Bitton.
- "Microbiology: Principles and Explorations" by Jacquelyn G. Black

ADD-ON CERTIFICATE COURSE ON SCIENTIFIC RESEARCH PAPER WRITING

DEPARTMENT OF BOTANY

SIR P.T. SCIENCE COLLEGE, MODASA

Principal
Sir P. T. Science College
Modasa

ADD-ON COURSE (DEPARTMENT OF BOTANY)

COURSE TITLE: SCIENTIFIC RESEARCH PAPER WRITING

COURSE DESIGN

COURSE BACKGROUND:

This course is designed to develop students' abilities to write effectively in the scientificcommunity. Students will learn to write clear, concise, and well-organized scientificpapers, research proposals, and literature reviews. The course will focus on theelements of good scientific writing, including structure, style, citation, and ethical issues.

REQUIREMENTS:

- Student-participants: Internal (students of B.Sc. Botany Sem VI)
- Teachers: Internal Faculty members of Department of Botany. External faculty members, research scholars and scientists may be invited to conduct some classes depending on their willingness and availability.
- Course Fee: Nil
- Intake Capacity: 20
- Contact hours: 30 hrs.
- Class/Lecture duration: 1 hr.

OBJECTIVES OF THE COURSE:

1. Upon completion of this course, students should be able to:
2. Understand the principles of scientific writing
3. Develop clear and concise scientific writing skills
4. Use effective scientific citation techniques
5. Understand and apply the ethical principles of scientific writing
6. Develop the ability to give and receive constructive feedback

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COURSE OUTLINE:

Week 1: Introduction to Scientific Writing 5 hours

- Overview of the course
- Principles of scientific writing
- Overview of scientific research

Week 2: Understanding Research Proposals and literature review 5 hours

- Structure and format of research proposals
- Identifying research questions
- Structure and format of literature reviews
- Analysing and understanding a literature review

Week 3: Introduction to Scientific Papers 5 hours

- Structure and format of scientific papers
- Writing a compelling introduction
- Developing a clear methodology
- Results and analysis

Week 4: Communicating Results and Data 5 hours

- Understanding data presentation
- Developing tables and figures
- Using effective graphic design

Week 5: Scientific Citation and Referencing 5 hours

- Understanding citation styles
- Citation and plagiarism
- Referencing in scientific writing

Week 6: Ethical Issues in Scientific Writing **5 hours**

- Ethical principles in scientific writing
- Misconduct and fraud in scientific writing
- Peer review and publication ethics

ASSESSMENT:

A. Class participation (20 MARKS)
B. Identification of scientific problem and writing a review research paper on it which will be evaluated from the following points:
   (i) Identification of scientific problem (20 MARKS)
   (ii) Scientific paper framework (20 MARKS)
   (iii) Introduction and review (20 MARKS)
   (iv) Citation writing (20 MARKS)

STUDENT FEEDBACK:

- It will be collected via Google Form after completion of the course.

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ADD ON COURSE

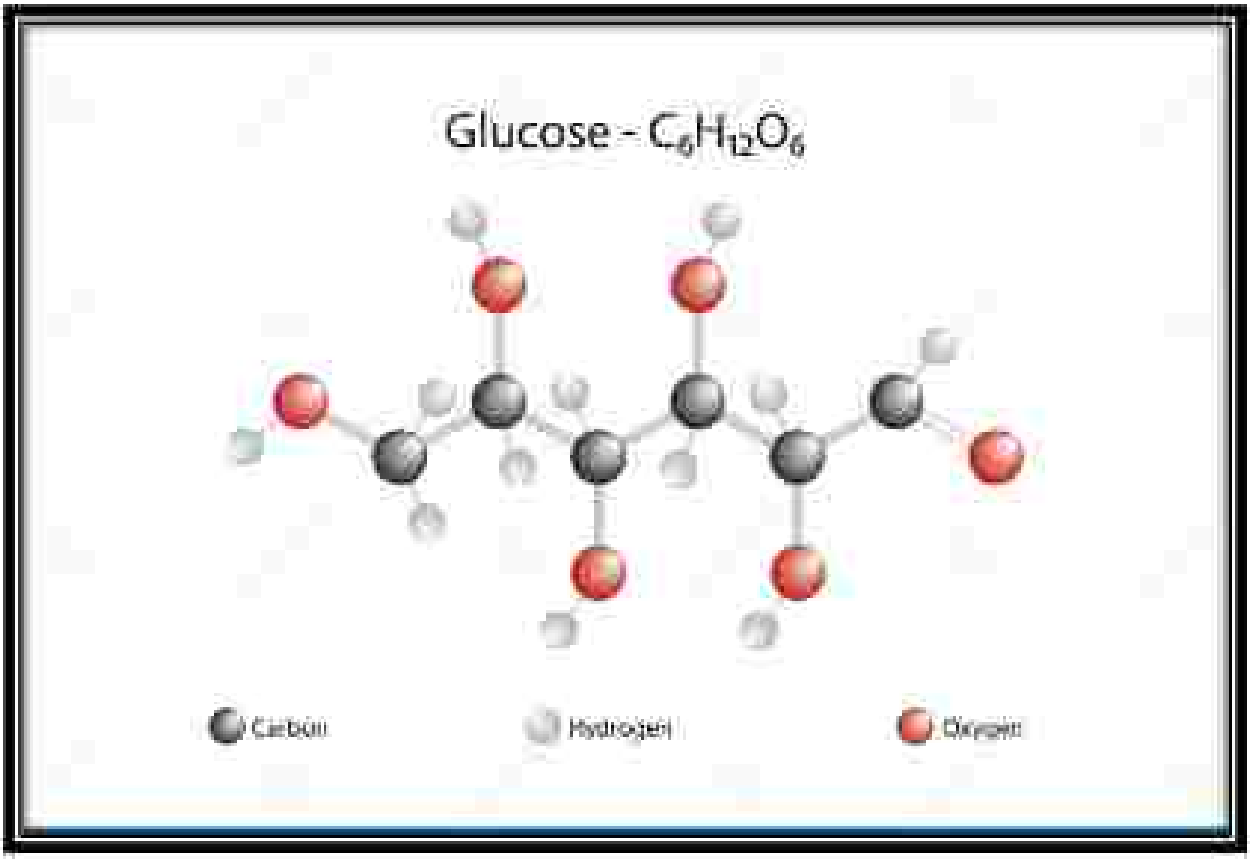
ON

"ESTIMATION OF GLUCOSE PRESENT IN DIFFERENT FRUITS AND IN CANDY"

DATE: 15-02-2024 TO 16-03-2024

Duration: 30 Hours

Number of Total Students: 30



Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

❖ Course Objectives:

- Due to importance and essentiality of glucose in our body- Shows percentage of glucose in different fruits and candy – Glucose ,the sugar used to make candy, is an essential nutrient for the human body – Glucose serves a primary fuel to generate energy - Estimation of glucose which is present in different fruit and candy.

SIR P.T.SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on 02-02-2024 Friday at 02:00 pm to prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in this meeting.

The attached syllabus of 30 hours **"ADD ON COURSE ON: "ESTIMATION OF GLUCOSE-2024"** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.PUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P.GONGIWALA	PG In charge Chemistry Department	
8	Dr. S. M. DAVE	Assistant Professor	
9	Dr J. N. PATEL	Assistant Professor	

ADD ON COURSE ON "*ESTIMATION OF GLUCOSE PRESENT IN DIFFERENT FRUITS AND IN CANDY*"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15/02/2024 to 16/03/2024 **Course Duration: 30 Hours**

Course Syllabus

Unit: 1 Glucose **7 Hours**

1.1 Formula – $C_6H_{12}O_6$
1.2 Molar –Mass - 180.56 gm/mol
1.3 Melting point – 146 °C
1.4 Heat capacity - 218.6 $JK^{-1}mol^{-1}$

Unit: 2 Glucose types **7 Hours**

2.1 D – Glucose

2.2 L - Glucose

Unit: 3 Sugar in Fruits

3.1 Coconut :- 6g Sugar **8 Hours**

3.2 Mango :- 14g Sugar

3.3 Grapes :- 16g Sugar

3.4 Apple :- 10g Sugar

3.5 Kiwi :- 9g Sugar

Unit -4 Foods Highest in Glucose

4.1 Honey :- 7.5 g Sugar (1.9 tsp) Glucose pertbisp

:- 64 calories

4.2 Fast Food :- (Hot cakes with syrup)

:- 11.2g (2.8 tsp) Glucose pertbisp 3- pancakes

:- 601 calories

4.3 Sugary Soft Drinks (cola) :- 20.2g (5 tsp) Glucose per 1602 bottle

:- 207 calories

Unit – 5 Experiment

5.1 Oxidation of Glucose (Original Experiment)

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SIR P.T.SCIENCE COLLEGE, MODASA

ADD ON COURSE ON *"ESTIMATION OF GLUCOSE PRESENT IN DIFFERENT FRUITS AND IN CANDY"*

Organized by Department of Chemistry

Course Distribution (30 Hours)

Unit 1	**GLUCOSE** 1.1 Formula – $C_6H_{12}O_6$ 1.2 Molar –Mass - 180.56 gm/mol 1.3 Melting point – 146 °C 1.4 Heat capacity - 218.6 $JK^{-1}mol^{-1}$	7 Hours
Unit 2	**Glucose types** 2.1 D – Glucose 2.2 L - Glucose	7 Hours
Unit 3	**Sugar in Fruits** 3.1 Coconut :- 6g Sugar 3.2 Mango :- 14g Sugar 3.3 Grapes :- 16g Sugar 3.4 Apple :- 10g Sugar 3.5 Kiwi :- 9g Sugar	5 Hours
Unit -4	**Foods Highest in Glucose** 4.1 Honey :- 7.5 g Sugar (1.9 tsp) Glucose Pertbisp :- 64 calories 4.2 Fast Food :- (Hot cakes with syrup) :- 11.2g (2.8 tsp) Glucose Pertbisp 3-pancakes :- 601 calories 4.3 Sugary Soft Drinks (cola) :- 20.2g (5 tsp) Glucose per 1602 bottle :- 207 calories	5 Hours
Unit -5	**Estimation**	6 Hours

"ADD ON COURSE ON: *ESTIMATION OF GLUCOSE PRESENT IN DIFFERENT FRUITS AND IN CANDY*"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15-02-2024 to 16-03-2024

Programme (Time-Table)

Date	Time	Activity	Name of Expert
15/02/2024	8.0 am to 10.0 am	Introduction of course	Principal & Chemistry Staff
16/02/2024	8.0 am to 10.0 am	Theory Unit I	
20/02/2024	8.0 am to 10.0 am	Theory Unit I	Dr. S. M. Dave
21/02/2024	8.0 am to 10.0 am	Practical Unit I	
22/02/2024	8.0 am to 10.0 am	Theory Unit II	Dr. D.R. Fudani
26/02/2024	8.0 am to 10.0 am	Theory Unit II	Dr. J.N. Patel
27/02/2024	8.0 am to 10.0 am	Theory Unit II	Dr. S.V. Patel
28/02/2024	8.0 am to 10.0 am	Practical Unit II	Dr. S. M. Dave
01/03/2024	8.0 am to 10.0 am	Theory Unit III	Dr. S. V. Patel
04/03/2024	8.0 am to 10.0 am	Theory Unit III	Dr. M.P. Gongiwala
05/03/2024	8.0 am to 10.0 am	Theory Unit III	Dr. J. N. Patel
07/03/2024	8.0 am to 10.0 am	Practical Unit III	Dr. D.R. Fudani
09/03/2024	8.0 am to 10.0 am	Practical Unit III	Dr. T.M. Patel
11/03/2024	8.0 am to 10.0 am	Practical Unit III	
13/03/2024	8.0 am to 10.0 am	Practical Unit III	Dr. S. M. Dave
16/03/2024	8.0 am to 10.0 am	Practical Unit III	Dr. S. V. Patel

❖ Reference Books:

1. ESTIMATION OF GLUCOSE BY DR. AZAD ALAM SIDDIQUI.
2. DETERMINATION OF GLUCOSE BY D. JIM LIVINGSTON.
3. REGULATION OF BLOOD GLUCOSE CONCENTRATION BY R.C GUPTA.
4. PREDICTION METHODS FOR BLOOD GLUCOSE CONCENTRATION BY HARALD KIRCHSTEIGER JOHN BAGTERP JORGENSEN.

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15/02/2024 to 16/03/2024

Result Sheet *B.Sc Sem 5*

No.	Roll No.	Student Name	Obtained Mark (30)	Grade
1	1101	AASTHA J. PATEL	26	A
2	1102	ABHILASHA V. CHUAHAN	24	B
3	1104	AJAY S.DAMOR	24	B
4	1106	ARSHITABEN M. PATEL	23	B
5	1107	ANEEBEN J. ACHARYA	24	B
6	1108	ANIKETSINH V. RAVAT	24	B
7	1110	ANKIT V. ROT	23	B
8	1112	BHAVIN J. PARMAR	23	B
9	1113	CHARMI K. PATEL	23	B
10	1114	DHARMESH R. KHANT	22	B
11	1116	DIVYA D. PARMAR	24	B
12	1117	GOPI A. PATEL	24	B
13	1118	HANI D. PATEL	26	A
14	1119	HARVI R. PATEL	24	B
15	1123	JIGNESH A. DAMOR	22	B
16	1125	KAVITA M. ZALA	25	A
17	1132	MENIL R. PATEL	24	B
18	1135	NIMISHAKUNVAR J. CHAUHAN	23	B
19	1137	PAYAL P. MaSAR	23	B
20	1138	PRACHIBEN M. CHAUDHARI	26	A
21	1140	RIDDHI K. PANCHAL	22	B
22	1141	RIMA D. PATEL	26	A
23	1142	ROHAN M. DEVDA	25	A
24	1143	RUTVA M. PATEL	23	B
25	1145	SAGAR M. PRAJAPATI	25	A
26	1149	SWETA J. PATEL	24	B
27	1150	TARANNUMBANU S. MANSURI	26	A
28	1152	VIJAYSHKUMAR K. DAMI	23	B
29	1153	VRUSHALI A. CHAUDHARI	23	B
30	1156	KRUPA J.THAKOR	24	B

Note: All 30 Students are successfully completed the course and get certificate.

"ADD ON COURSE ON: INSTRUMENTATION TECHNIQUES IN PHYSICAL CHEMISTRY"-2021

Organized by

Department of Chemistry

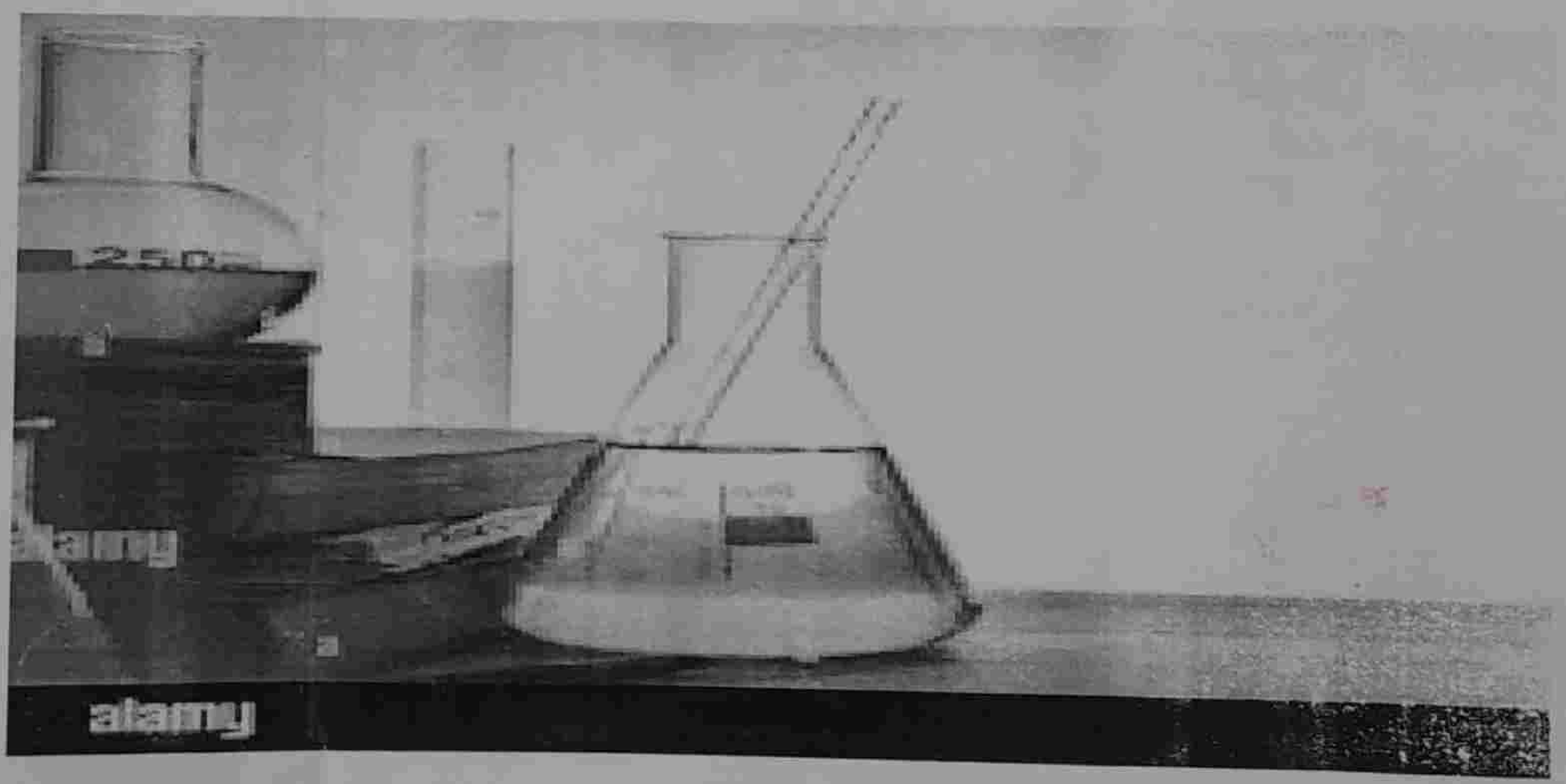
SIR P.T.SCIENCE COLLEGE,MODASA

Batch – I

Duration: 30 Hours

Number of total students: Maximum 30

Date: 06-09-2021 TO 25-09-2021



Department of Chemistry

SIR P.T.SCIENCE COLLEGE,MODASA

SCIENCE COLLEGE ● SIR P. T. ● MODASA 32 127

Principal
Sir P. T. Science College
Modasa-383315, Dist.Arvalli.

Course Objectives :

Due to importance and essentiality of Physical Chemistry in Each branch of Sciences – Shows usage of subject fundamental – principle with practical knowledge to design experiments, analyze and interpret data so as to reach to valid conclusions. It will be more useful for students who are going to build their carrier in Chemical and pharmaceutical industries.

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Principal
Sir P. T. Science College
Modasa-383315, Dist.Arvalli.

SIR P.T.SCIENCE COLLEGE,MODASA

Minutes

A meeting of the committee consisting by the following members was held on 02-08-2021 Monday at 02:00 pm to prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in this meeting.

The attached syllabus of 30 hours **"ADD ON COURSE ON: INSTRUMENTATION TECHNIQUES IN PHYSICAL CHEMISTRY"-2021** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.FUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P.GONGIWALA	PG incharge Chemistry Department	

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Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli.

APPROVED SYLLABUS OF ADD ON COURSE ON INSTRUMENTATION TECHNIQUES IN PHYSICAL CHEMISTRY"-2021

Prepared by
Department of Chemistry

Course Co-Ordinator : Dr. S.V.Patel
Joint Co-Ordinator : Dr. M.P.Gongiwala
Year 2021-22
SIR P.T.SCIENCE COLLEGE, MODASA.
Date: 06-09-2021 TO 25-09-2021

Syllabus (30 Hours)

Unit: I Calibration — **6 hours**

Why Calibration require? Calibration of Burette, Pipette, Measuring flask. Calibration of PH meter, Potentiometer, Conductometer, Colourimeter.

Unit: II pH metry — **6 hours**

Principle of pH meter, Definition, measurement, electrode types, electrode maintenance, Buffers, calibration, pH metric titrations, Graphical methods including plot of selecting end point.

Unit: III Conductometry — **6 hours**

Electrolytic Conductance: Strong electrolytes, weak electrolytes, Measurement of electrolytic conductance, Types of Conductometric titrations. Graphical methods including plot of selecting end point. Experiment.

Unit: IV Potentiometric — **6 hours**

Concept of potentiometric, Types of electrode, Types of potentiometric titration. How to calibrate potentiometer, how to make salt bridge, Type of titration, graphical methods including plot of selecting end point. Experiment.

Unit: V Colourimetry — **6 hours**

Lambert Beer's law, Calibration of given colorimeter, Graphical methods including plot of selecting end point. Determination of amount of NO_2^-, Ni^{+2}, $PO4^{-3}$ by colorimetric method. Experiment.

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Syllabus of "ADD ON COURSE ON: INSTRUMENTATION TECHNIQUES IN PHYSICAL CHEMISTRY"-2021

Unit : 1	**Calibration** Why Calibration require? Calibration of Burette, Pipette, Measuring flask. Calibration of PH meter, Potentiometer, Conductometer, Colorimeter.	2 Hours
	Practicals – To Calibration the burette, measuring flask & Pipette.	4 Hours
Unit : 2	**pH Metry** Principle of pH meter, Definition, measurement, electrode types, electrode maintenance, Buffers, calibration, pH metric titrations, Graphical methods including plot of selecting end point.	2 Hours
	Practicals – To determine the strength of strong and weak acids in given mixture using a pH meter (1) $HCl+CH_3COOH$ (2) $NaOH+NH_4OH$.	4 Hours
Unit : 3	**Conductometry** Electrolytic Conductance: Strong & weak electrolytes, Measurement of electrolytic conductance, Types of Conductometric titrations. Graphical methods including plot of selecting end point. Experiment.	2 Hours
	Practicals – (1) To determine the solubility product and solubility of sparingly soluble salts ($PbSO_4$,$BaSO_4$) by conduct meter (2) To determine the strength of strong and weak acids in a given mixture using a Conductometer. (HCl+NaOH).	4 Hours
Unit : 4	**Potentiometry** Concept of potentiometric, Types of electrode, Types of potentiometric titration. How to calibrate potentiometer, how to make salt bridge, Type of titration, graphical methods including plot of selecting end point. Experiment.	2 Hours
	Practicals – 1. To determine of strength of halides in given solution using potentiometer. 2. Redox titration by Potentiometry.	4 Hours
Unit : 5	**Colorimery** Lambert Beer's law, Calibration of given colorimeter, Graphical methods including plot of selecting end point. Determination of amount of NO_2^-, Ni^{+2}, $PO4^{-3}$ by colorimetric method. Experiment.	2 Hours
	Practicals – To determine the Concentration of unknown NO_2^-, Ni^{+2}, PO_4^{-3} by colorimetric method.	4 Hours

Reference Books:

1. Physical Advanced Chemistry Practical by J.B. yadav
2. Physical chemistry practical by Pragatiprakashan
3. Practical Physical Chemistry by B. Vishwanathan, P.S. Raghavan
4. Physical Chemistry Practical BySaroj Kr Mairy, Naba Kr Ghosh
5. Experiments in Physical Chemistry by P.H.Parsaniya.

ADD ON COURSE

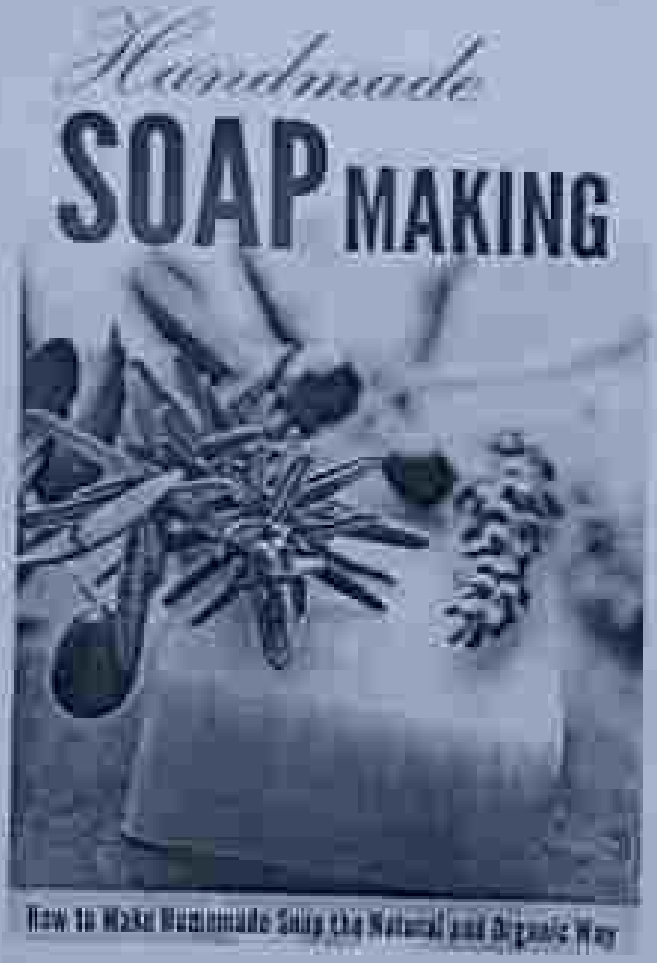
ON

"MANUFACTURING OF SOAP & DETERGENT"

DATE: 01-01-2024 TO 20-01-2024

Duration: 30 Hours

Number of Total Students: 34



Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

Course Objectives:

- Discover the start-to-finish process of soap and detergent manufacturing with explanations of and machinery needed for metering, saponification, cooling, washing, neutralizing, drying, and finishing.
- Understand soap products' applications in the personal, fabric, and home care industries. And also understanding of oil, fat, and their sources in India.
- It will be more useful for students who are going to earn money by small business at home.

ADD ON COURSE

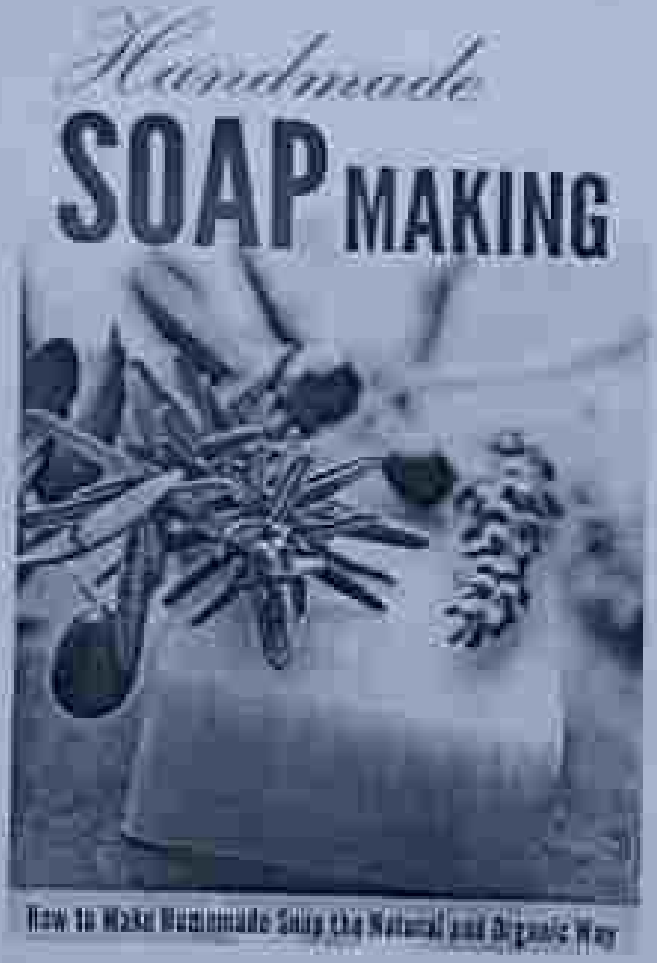
ON

"MANUFACTURING OF SOAP & DETERGENT"

DATE: 01-01-2024 TO 20-01-2024

Duration: 30 Hours

Number of Total Students: 34



Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

Course Objectives:

- Discover the start-to-finish process of soap and detergent manufacturing with explanations of and machinery needed for metering, saponification, cooling, washing, neutralizing, drying, and finishing.
- Understand soap products' applications in the personal, fabric, and home care industries. And also understanding of oil, fat, and their sources in India.
- It will be more useful for students who are going to earn money by small business at home.

SIR P.T.SCIENCE COLLEGE, MODASA

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Minutes

A meeting of the committee consisting by the following members was held on 15-12-2023 Friday at 02.00 pm to prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in this meeting.

The attached syllabus of 30 hours **"ADD ON COURSE ON: "Manufacturing of Soap & Detergent" -2024** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.PUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P.GONGIWALA	PG in charge Chemistry Department	
8	Dr. S. M. DAVE	Assistant Professor	
9	Dr. J. N. PATEL	Assistant Professor	
10	Dr. T. M. PATEL	Assistant Professor	
11	Prof. V. P. VALVI	Assistant Professor	
12	Dr. G. N. BARIA	Assistant Professor	

Principal
Sir P. T. Science College
Modasa

ADD ON COURSE ON "Manufacturing of Soap & Detergent"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 01/01/2024 to 20/01/2024 **Course Duration: 30 Hours**

Course Syllabus

Unit: 1 Introduction to oil and fats: **4 Hours**

1.1 Classification, structure and sources of oil and fats
1.2 Natural sources of oils and fats in India

Unit: 2 Soaps: **6 Hours**

2.1 Introduction to soap, synthetic detergents, raw materials and its selection

2.2 Principles of soap making and chemistry of soap

2.3 Boiling, saponification process

Unit: 3 Detergents: **6 Hours**

3.1 Types of detergents, classification of detergents (anionic, non-ionic, Amphoteric), biodegradability

3.2 Inorganic compounds of detergents (builder & other additives, phosphates, silicates, zeolites etc.

Unit: 4 Practical: **14 Hours**

4.1 Determination of physico-chemical characteristics of oil and fats

i. Moisture content
ii. Acid value
iii. Iodine value
iv. Saponification reaction and Saponification value

4.2 Manufacture of liquid soap and laundry soap (detergent)

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Manufacturing of Soap & Detergent" -2024

Prepared by

Department of Chemistry

Course Co-Ordinator: Dr. G.N.Barla

Year: 2023-24

Sir P. T. Science College, Modasa

Date: 01-01-2024 to 20-01-2024

Course Syllabus (30 Hours)

Unit: 1 Introduction to oil and fats: **4 Hours**

1.1Classification, structure and sources of oil and fats

1.2Natural sources of oils and fats in India

Unit: 2 Soaps: **6 Hours**

2.1 Introduction to soap, synthetic detergents, raw materials and its selection

2.2 Principles of soap making and chemistry of soap

2.3 Boiling, saponification process

Unit: 3 Detergents: **6 Hours**

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Unit: 4 Practical: **14 Hours**

4.1 Determination of physico-chemical characteristics of oil and fats

i. Moisture content
ii. Acid value
iii. Iodine value
iv. Saponification reaction and Saponification value

4.2 Manufacture of liquid soap and laundry soap (detergent)

Sir P. T. Science College

SIR P.T.SCIENCE COLLEGE, MODASA

ADD ON COURSE ON "Manufacturing of Soap & Detergent"

Organized by Department of Chemistry

Course Distribution (30 Hours)

Unit 1	1.1Classification, structure and sources of oil and fats 1.2Natural sources of oils and fats in India	4 Hours
Unit 2	2.1 Introduction to soap, synthetic detergents, raw materials and its selection 2.2 Principles of soap making and chemistry of soap 2.3 Boiling, saponification process	6 Hours
Unit 3	3.1 Types of detergents, classification of detergents (anionic, non-ionic, Amphoteric), biodegradability 3.2 Inorganic compounds of detergents (builder & other additives: phosphates, silicates, zeolites etc.	6 Hours
Unit 4	4.1 Determination of physico-chemical characteristics of oil and fats i. Find out the moisture value in different oil ii. To determine acid value of given oil sample iii. To determine iodine value in oils and fats iv. To determine saponification value in given oil	8 Hours
	4.2 Manufacture of liquid soap and laundry soap (detergent) a. Preparation of soap base b. Preparation of different type of soap from soap base c. Preparation of liquid detergent	6 Hours

ADD ON COURSE

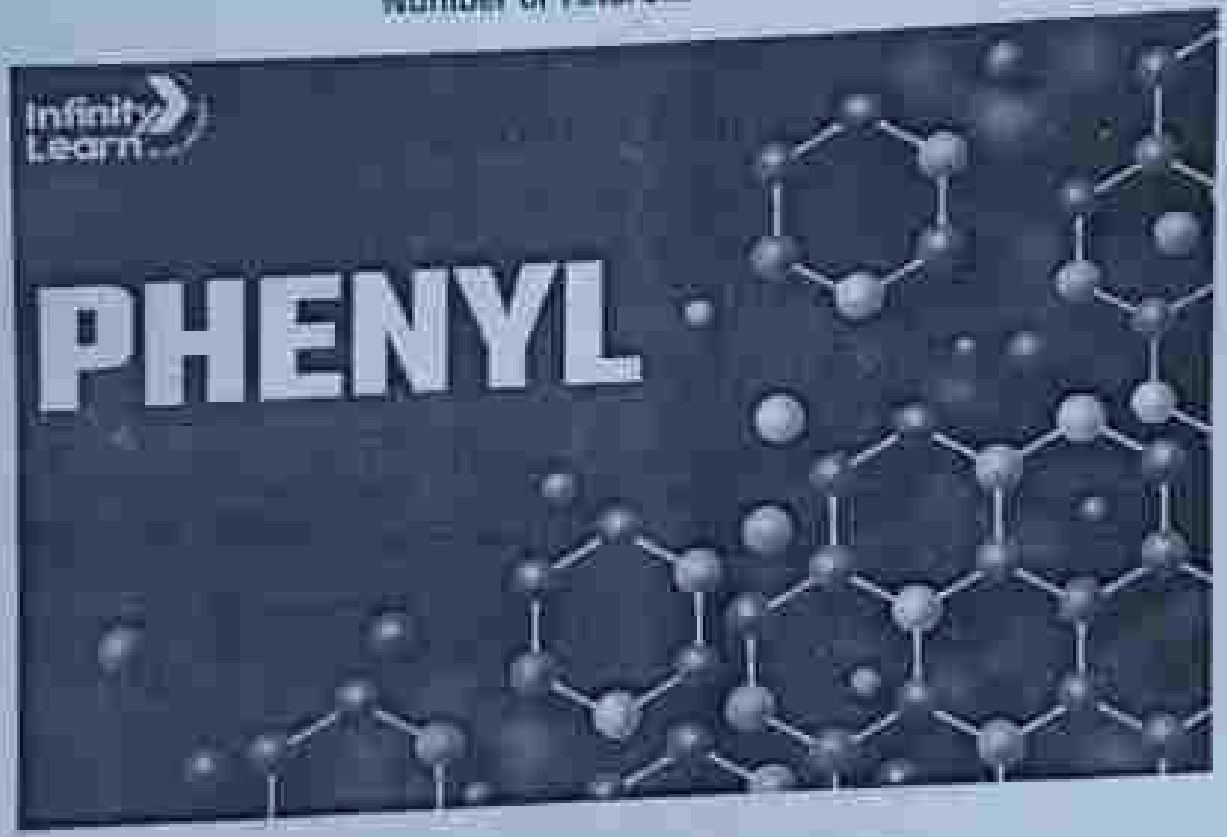
ON

"MAKING OG PHENYL"

DATE: 03-07-2023 TO 20-07-2023

Duration: 30 Hours

Number of Total Students: 30



Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

❖ Course Objectives:

- Discover the start-to-finish process of phenyl manufacturing with explanations of and uses and benefits of making phenyl at home.
- Understand phenyl products' applications in the personal home care and industries.
- It will be more useful for students who are going to earn money by small business at home.

SIR P.T.SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on 26-06-2023 Friday at 02:00 pm to prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in this meeting.

The attached syllabus of 30 hours **"ADD ON COURSE ON: "Making of Phenyl"-2023** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VIDHYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.FUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P.GOHILWALA	PG in charge Chemistry Department	
8	Dr. S.M. DAVE	Assistant Professor	
9	Dr J.N. PATEL	Assistant Professor	

SIR P.T.SCIENCE COLLAGE
Principal
Sir P. T. Science College
Modasa-383315, Dist.Aravalli

ADD ON COURSE ON "Making of Phenyl"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 03/07/2023 to 20/07/2023 **Course Duration: 30 Hours**

Course Syllabus

Unit: 1 Introduction of phenyl (concept) **7 Hours**

1.1 Concept of phenyl, Various types of phenyl
1.2 Introduction to emulsifies of phenyl
1.3 Advantages of phenyl

Unit: 2 Phenyl making process **7 Hours**

2.1 Content of phenyl cleaner
2.2 Making of toilet cleaner, floor cleaner, liquid dish wash
2.3 Phenyl making process
2.4 Phenyl making ingredients
2.5 Phenyl making training

Unit: 3 Practical

3.1 Making of white phenyl **8 Hours**

3.2 Making of Black Phenyl **8 Hours**

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Making of Phenyl" -2023

Prepared by

Department of Chemistry

Course Co-Ordinator: Dr. S.M. Dave

Year: 2023-24

Sir P. T. Science College, Modasa

Date: 03-07-2023 to 20-07-2023

Course Syllabus (30 Hours)

Unit: 1 Introduction of phenyl (concept) **7 Hours**

1.1Concept of phenyl, various types of phenyl

1.2Introduction to emulsifies of phenyl

1.3 Advantages of phenyl

Unit: 2 Phenyl making process **7 Hours**

2.1 Content of phenyl cleaner

2.2 Making of toilet cleaner, floor cleaner, liquid dish wash

2.3 Phenyl making process

2.4 Phenyl making ingredients

2.5 Phenyl making training

Unit: 3 Practical

3.1 Making of white phenyl **8 Hours**

3.2 Making of Black Phenyl **8 Hours**

SIR P.T.SCIENCE COLLEGE, MODASA

ADD ON COURSE ON "Making of Phenyl"

Organised by Department of Chemistry

Course Distribution (30 Hours)

Unit 1	1.1Concept of phenyl, Various types of phenyl 1.2 Introduction to emulsifies of phenyl 1.3 Advantages of phenyl	7 Hours
Unit 2	2.1 Content of phenyl cleaner 2.2 Making of toilet cleaner, floor cleaner, liquid dish wash 2.3 Phenyl making process 2.4 Phenyl making ingredients 2.5 Phenyl making training	7 Hours
Unit 3	3.1 Making of white phenyl 3.2 Making of Black Phenyl	16 Hours

Sir P T Science College Modasa,
Integrated Skill Initiative

"Certificate course on Skill Development in Advanced Spectroscopic data interpretation (NMR, MASS, UV/IR) techniques" (Hand On)

Principal
Sir P. T. Science College
Modasa-383315, Dist.Aravalli.

DURATION:-30hrs

HOURS DISTRIBUTION:-

Theory:-20 hrs
Practical:-10
hrsTotal:-30 hrs

RATIONAL:-

The certificate course in instrumentation is put forward with a view to enlighten the knowledge of handlingandusesofsophisticatedinstrumentsforobtainingscientificresults.Thesciencegraduatesandpostgraduatesutilizevariousinstrumentsalongwithsufficienttheoretical,technical,andpracticalknowledgeandtrainingforuseofinstrumentsthoughapanelofexpertsinrespectivefields.Thecoursewillbeveryproductivetostudentswhowanttostartacareerinmanyfieldviz.ResearchInstitutions/Academics/Pharmaceutical/ Chemical industries. The course stretches itself from use of basic instruments (UV spectrophotometer) to advanced instruments (Zetasizer)

CENTRALOBJECTIVE OFTHE COURSE:-

In Gujrat more than 2000 Pharma industries, and chemical, Agrochemical, Polymer industries in R&D lab, QC. lab PD lab all sophisticated instrument is used which including PAITC. On the completion of thecourse students will be able to gain knowledge and Practical base operation, and application and calibration skills in dealing with sophisticated instruments like as, UV, IR, in various industries.

ADMISSIONREQUIREMENT:-

1. The minimum age for admission shall be21yrs.
2. The minimum education requirement shall be the passing of BSc/MSc chemistry or Chemical sciences.
3. Candidate shall be medically fit.

INTAKE:-

Intake of student total 20-30forcertificate course.

PROPOSEDFEES:-

Proposed fees shall be selected by College.

For course proposed fee50/-rupees per student.

DURATION:-

Course Duration: -

1monthWeeksavailable:-

4weeks

Hours per week: - 7. 5 hrs

(APPROX)Theory: -20hrs

Practical: - 10

hrs.Totalhrs:-30hrs

SCHEMEOFEXAMINATION:-

SUBJECT	EXAMHOURS	EXTERNAL
Theory PAITC	2	40marks
Practical PAITC	20minutes	10marks

REGULATIONFOREXAMINATION:-

- Minimum passing marks shall be50%in each of theory and Practical
- A candidate must be having80% attendance in the one month for appeared in examination.
- Maximum number of attempt permitted for 2times.
- Provisionofsupplementaryexaminationshould bemade.
- Classification of result: - 50-59% second division, 60-74% first division, 75% & above isdistinction.
- TheMaximumperiod tocompletethe courseaccessfullyshouldnotexceed2yrs.
- PracticalexamsmustbeheldinrespectiveCollege orResearchcenter.
- Maximumnumberofcandidateforpracticalexaminationshouldnotexceed 20perday.

COURSE OFINSTRUCTION:-

SUBJECT	THEORY(hrs)	PRACTICAL(hrs)	TOTAL(hrs)
PAITC	40	60	100

Sir P T Sciences College, Modasa

"Add on course of Skills Development in advance spectroscopic Technique"

data interpretation of unknown compound through NMR (H1, C13), IR.

30hrs

Unit 1: **10hrs**

1H NMR Spectroscopy-I Introduction to NMR; isotope ratios, nuclear spin; chemical shifts, coupling constants and integration; Fourier transform technique. Chemical shifts, coupling constants and correlation with structure and stereochemistry. Long range coupling; magnetic and chemical shift equivalence; first and second order spectra; dynamic process; simplification of spectra by shift reagents and decoupling experiments; stereochemistry by NOE measurements.

Unit 2 **10hrs**

1H NMR Spectroscopy-II Nuclear Spin states and Larmor precession, spin-spin and spin-lattice relaxations Selection rules and relative intensities of lines Treatment of Chemical Shift and spin-spin coupling in AX, AMX and AB proton NMR, Multinuclei NMR with special reference to C-13 and relative abundances and intensities, Spin-decoupling methods, Origin of NMR chemical shift, and spin-spin coupling, Factors Affection Chemical Shifts, Chemical exchange, Pulsed FT-NMR- Time and Frequency Domain Spectra.

Unit 3 **10hrs**

Carbon -13 NMR Spectroscopy: General considerations, chemical shift (aliphatic, olefinic, alkyne and aromatic hetero aromatic and carbonyl carbon), Coupling constants.

Books Suggested:

1. Practical NMR Spectroscopy, M. L. Martin, J. J. Deeplsh and G. J. Martin, Heyden.

2. Spectrometric Identification of Organic Compounds, R. M. Silverstein, G. C. Bassler and T. C. Morrill, John Wiley.

3. Introduction to NMR spectroscopy, R. J. Abraham, J. Fisher and P. Loftus, Wiley.

4. Application of Spectroscopy of Organic Compounds, J. R. Dyer Prentice Hall.

5. Spectroscopic Methods in Organic Chemistry D. H. Williams, I. Fleming, Tata McGrawHill.

6. W. Kemp, Organic Spectroscopy, 3rd edition, Wiley, 1995.

7. Introduction to Spectroscopy: Donald L. Pavia, Thompson, 2009

8. Modern NMR techniques for Chemistry Research, A. E. Derome, Pergamon.

9. Physical Methods in Chemistry, R. S. Drago, Saunders College.

10. Chemical Applications of Group Theory, F. A. Cotton

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Principal
Sir P. T. Science College
Modasa-383315,Dist.Aravalli.

SCIENCE COLLEGE ● SIR P. T. ● MODASA
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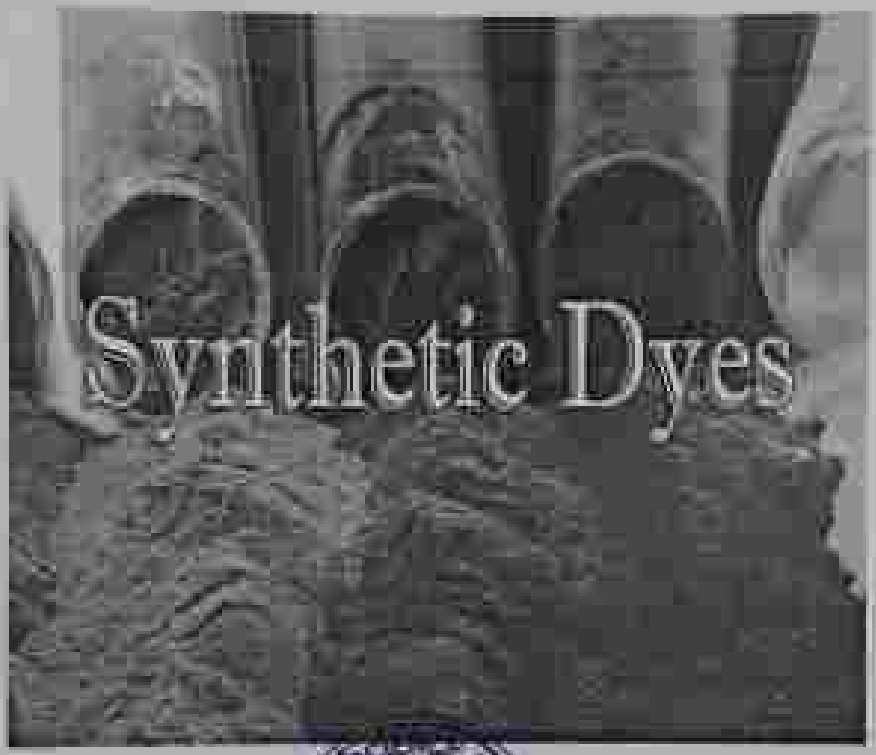
ADD ON COURSE
ON
"MANUFACTURING OF SYNTHETIC DYES"

DATE: 01-01-2024 TO 20-01-2024

Duration: 30 Hours

Number of Total Students: 30



Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

Course Objectives:

- Discover the start-to-finish process of dyes manufacturing with explanations of and synthesis of dyes.
- Understand Dyes products' applications in the personal, fabric, and home care industries. And also understanding their sources in India.
- It will be more useful for students who are going to earn money by small business at home.

SIR P.T.SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on [illegible] Friday at 03.00 pm to prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in the meeting.

The attached syllabus of 30 hours **"ADD ON COURSE ON: "Manufacturing of Synthetic Dyes" -2024** is approved by this committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.FUDANI	Head of the Chemistry Deparument	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P.GONGIWALA	PG In charge Chemistry Department	
8	Dr. S. M. DAVE	Assistant Professor	
9	Dr. J. N. PATEL	Assistant Professor	
10	Dr. T. M. PATEL	Assistant Professor	
11	Prof. Y. P. VALVI	Assistant Professor	
12	Dr. G. N. BARIA	Assistant Professor	

Principal
Sir P. T. Science College
Modasa

SIR P.T.SCIENCE COLLEGE, MODASA

ADD ON COURSE ON "Manufacturing of Synthetic Dyes"

Organized by Department of Chemistry

Date: 01/01/2024 to 20/01/2024 **Course Duration: 30 Hours**

Course Syllabus

Unit: 1 Introduction of Dyes: **2 Hours**

1.1 Classification, structure and sources of Dyes
1.2 Different types of Dyes

Unit: 2 Developments of Dyes: **4 Hours**

2.1 Discovery of Dyes

2.2 Uses of Dyes

Unit: 3 Colour and Chemical Constitution **4 Hours**

3.1 Witt's Theory, Modern Theory, Valance bond theory

3.2 Armstrong Theory-Imitation, Baeyers Theory, Watsons Theory

Unit: 4 Azo Dyes **6 Hours**

4.1 Introduction, Synthesis of Dyes
4.2 Method of Diazotization

Unit: 5 Azoic Dyes **6 Hours**

5.1 Introduction, Example of Azoic dyes

5.2 Synthesis of Azoic dyes

Unit: 6 Indigo Dyes **6 Hours**

6.1 Introduction, Indigo dyes/vat dyes, Indigo, structure of indigo

6.2 Synthesis of Indigo Heumanns synthesis, Sandmeyers process, Bayers synthesis

Unit: 7 Non-Textile uses of Dyestuffs **2 Hours**

7.1 Introduction, Leather dyes, Paper dyes, Food colures, solventdyes, Wood dyes,

7.2 Medicinal dyes, photography, Cosmetic dyes, Indicators & Reagent

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Manufacturing of Synthetic Dyes"-2024

Organized by Department of Chemistry

Course Co-Ordinator: Asst.Prof. Yogesh P. Valvi

Year: 2023-24

Sir P. T. Science College, Modasa

Date: 01-01-2024 to 20-01-2024

Course Syllabus (30 Hours)

Unit: 1 Introduction of Dyes: **2 Hours**

1.1Classification, structure and sources of Dyes

1.2Different types of Dyes

Unit: 2 Developments of Dyes: **4 Hours**

2.1 Discovery of Dyes

2.2 Uses of Dyes

Unit: 3 Colour and Chemical Constitution **4 Hours**

3.1 Witt's Theory, Modern Theory, Valance bond theory

3.2 Armstrong Theory-limitation, Baeyer's Theory, Watsons Theory

Unit: 4 Azo Dyes **6 Hours**

4.1Introduction, Synthesis of Dyes

4.2 Method of Diazotization

Unit: 5 Azoic Dyes **6 Hours**

5.1 Introduction, Example of Azoic dyes

5.2 Synthesis of Azoic dyes

Unit: 6 Indigo Dyes **6 Hours**

6.1 Introduction, indigo dyes/vat dyes, Indigo, structure of Indigo

6.2 Synthesis of Indigo Heumanns synthesis, Sandmeyers process, Bayer's synthesis

Unit: 7 Non-Textile uses of Dyestuffs **2 Hours**

7.1 Introduction, Leather dyes, Paper dyes, Food colures, solvent dyes, Wood dyes

7.2 Medicinal dyes, photography, Cosmetic dyes, Indicators & Reagent

Principal
Sir P. T. Science College
Modasa-383315 (Gujarat)

SIR P.T.SCIENCE COLLEGE, MODASA

ADD ON COURSE ON "Manufacturing of Synthetic Dyes"

Organized by Department of Chemistry

Course Distribution (30 Hours)

Unit	Syllabus	Hours
1	1.1Classification, structure and sources of Dyes 1.2Different types of Dyes	2 Hours
2	2.1 Discovery of Dyes 2.2 Uses of Dyes	4 Hours
3	3.1 Witt's Theory, Modern Theory, Valance bond theory 3.2. Armstrong Theory, Imitation, Baeyer's Theory, Watsons Theory	4 Hours
4	4.1Introduction, Synthesis of Dyes 4.2 Method of Diazotization	6 Hours
5	5.1 Introduction, Example of Azoic dyes 5.2 Synthesis of Azoic dyes	6 Hours
6	6.1 Introduction, indigo dyes/vat dyes, indigo, structure of indigo 6.2 Synthesis of Indigo Heumanns synthesis, Sondmeyers process, Bayer's synthesis	6 Hours
7	7.1 Introduction, Leather dyes, Paper dyes, Food colures, solvent dyes, Wood dyes. 7.2 Medicinal dyes, photography, Cosmetic dyes, Indicators & Reagent	2 Hours

ADD ON COURSE ON "Manufacturing of Synthetic Dyes"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 01-01-2024 to 20-01-2024

Programme (Time-Table)

Date	Time	Activity	Name of Expert
01/01/2024	8.0 am to 10.0 am	Introduction of course- Unit I	Principal & Chemistry Staff
02/01/2024	8.0 am to 10.0 am	Theory Unit II	Dr. D.R. Fudani
03/01/2024	8.0 am to 10.0 am	Theory Unit II	Dr. S.V. Patel
04/01/2024	8.0 am to 10.0 am	Theory Unit III	Dr. S M. Dave
05/01/2024	8.0 am to 10.0 am	Theory Unit III	Dr. J.N. Patel
06/01/2024	8.0 am to 10.0 am	Theory Unit IV	Prof. Y.P. Valvi
08/01/2024	8.0 am to 10.0 am	Practical Unit IV	Dr. T. M. Patel
09/01/2024	8.0 am to 10.0 am	Practical Unit IV	Dr. G. N. Baria
10/01/2024	8.0 am to 10.0 am	Theory Unit V	Dr. M.P. Gongiwala
11/01/2024	8.0 am to 10.0 am	Practical Unit V	Prof. Y.P. Valvi
12/01/2024	8.0 am to 10.0 am	Practical Unit V	Prof. Y.P. Valvi
15/01/2024	8.0 am to 10.0 am	Theory Unit VI	Dr. D R. Fudani
17/01/2024	8.0 am to 10.0 am	Practical Unit VI	Dr. T.M. Patel
18/01/2024	8.0 am to 10.0 am	Practical Unit VI	Prof. Y.P. Valvi
19/01/2024	8.0 am to 10.0 am	Theory Unit VII	Dr. G .N. Baria
20/01/2024	8.0 am to 10.0 am	Viva & Test	———

Principal
Sir P.T. Science College
Modasa-383315 Dist.Aravalli

"ADD ON COURSE ON: "WATER ANALYSIS OF DIFFERENT AREAS OF MODASA TALUKA"-2022

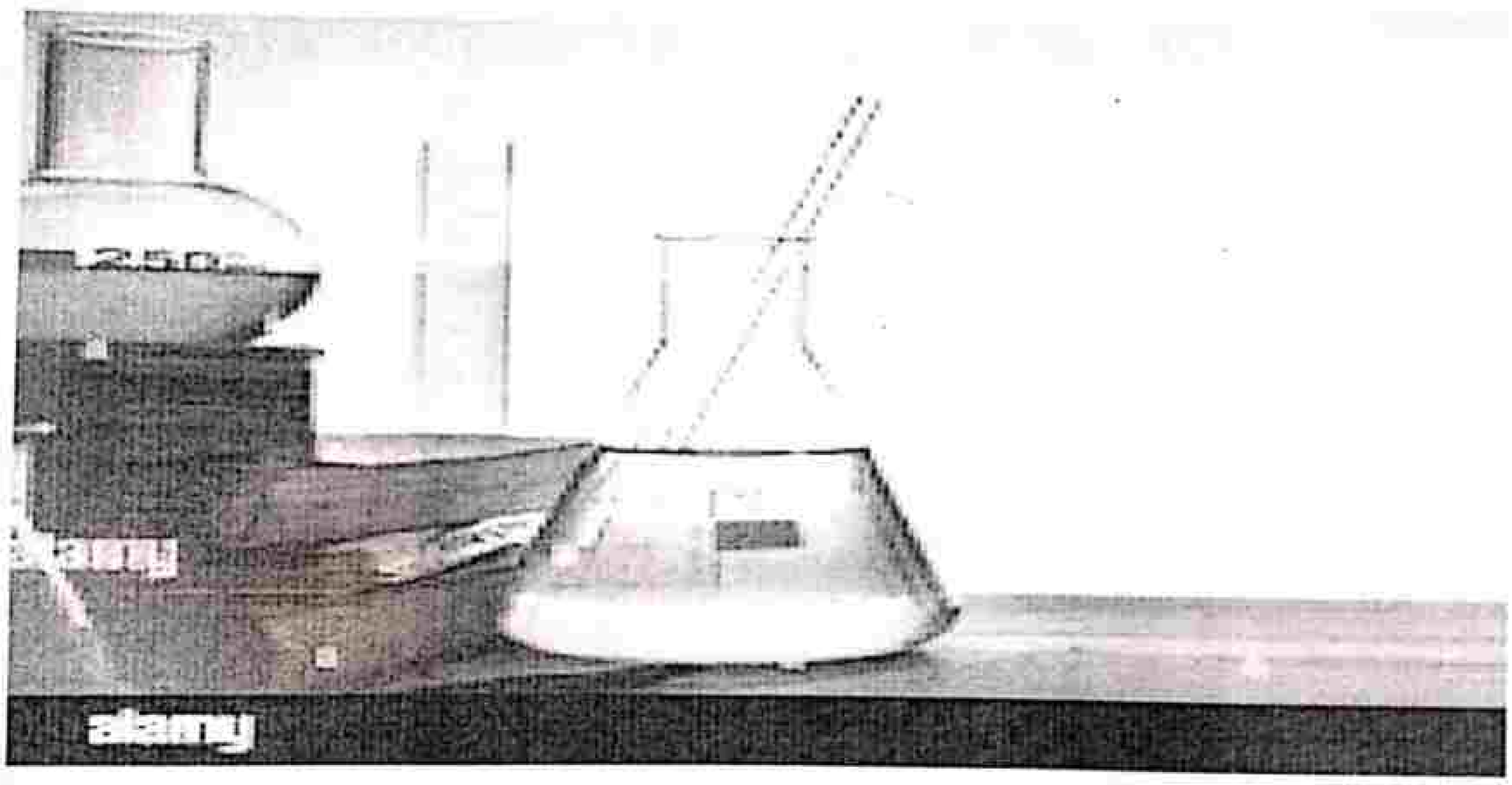
Organized by
Department of Chemistry

SIR P.T. SCIENCECOLLEGE, MODASA

Batch – I

Duration: 30 Hours
Number of total students: Maximum 30

Date: 05-09-2022 TO 24-09-2022



Department of Chemistry

SIR P.T.SCIENCE COLLEGE,MODASA

SIR P. T. SCIENCE COLLEGE 32 127 MODASA

Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli.

SIR P. T. SCIENCE COLLEGE, MODASA

ADD ON CERTIFICATE COURSE
ON
PHYSICOCHEMICAL PROPERTIES OF GIVEN WATER SAMPLE IN MODASA TALUKA

(EFFECTIVE FROM THE ACADEMIC SESSION 2022-23)

P.G. CENTER IN CHEMISTRY
DEPARTMENT OF CHEMISTRY

SIR P.T. SCIENCECOLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on 01-08-2022 Monday at 02:00pm to prepare the syllabus of add on course by Chemistry Department to be started in the college. The following members were present in this meeting. The attached syllabus of 30 hours**"ADD ON COURSE ON: "WATER ANALYSIS OF DIFFERENT AREAS OF MODASA TALUKA"-2022**is approved by this committee after intensive discussion and principal also sudjested Dr. J.N.Patel, chemistry department as course coordinator.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.D.VEDIYA	Head of the Botany Department	
3	Dr. G.L.VEKARIA	IQAC Coordinator	
4	Dr. D.R.FUDANI	Head of the Chemistry Department	
5	Dr. R.H.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. J.N. PATEL	Assistant Professor	

SIR P.T. SCIENCE COLLEGE 32 127 MODASA

Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli.

Course Objectives:

Due to importance and essentiality of Drinking water in our life. As a students of science faculty, it is their prime duty to aware the people of society about drinking water quality and importance of water in every one life. The main object of this course is that each student of science must know the quality parameters of drinking water and how it will measure and also how to improve the quality of drinking water in particular area.It will be more useful for students and also the people of society who are not aware about drinking water qualities.

SIR P. T. SCIENCE COLLEGE
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MODASA

Principal
Sir P. T. Science College
Modasa-383315,Dist.Arvalli.

SYLLABUS FOR ADD ON COURSE ON PHYSICO CHEMICAL PROPERTIES OF GIVEN SAMPLE IN MODASA TALUKA

CONTACT HOURS : 480 HOURS (20 DAYS)

CONTINUOUS ASSESMENT : 50 Marks

Unit-1: Water sources and pollution

Sources of water. Meaning of pure water Impurities in water Meaning of the terms Portability, Sewage, Affluent, Sample, Contamination, Eutrophication, Pollutants, Pollution Sources of water pollution. Major water pollutants. Types of water pollution: Ground water pollution. Fresh water pollution, Surface water pollution (River pollution, Pond and Lake pollution), Marine pollution (Oil Spills)

Unit II: Water analysis-I

Water Quality parameters: Physical parameters, Chemical parameters, Bacteriological parameters. Handness of water: Formation of hard water, Types of hardness, Degree of hardness, Units of hardness Determination of hardness: Soap solution method. Complexometric titration method using EDTA. Disadvantages of hard water: Domestic purposes, Industrial purposes. Alkalinity of water. Types of Alkalinity, Significance of Alkalinity, Estimation of Alkalinity.

Unit-III: Water Analysis-11

Dissolved oxygen, Biological Oxygen Demand, Chemical Oxygen Demand. Total Solids. Determination of Chlorides by Argentometric method. Determination of Fluorides by SPADNS method. Determination of Nitrate by Phenol Disulphonic method. Determination of Sulphate byGravimetric method. Determination of Dissolved Oxygen by Winkler's method

Unit-IV: Municipal Water and Waste Water Treatment Techniques

Municipal Water: Specifications for Drinking water. Treatment of water for Domestic purposes. Pre-treatinent, Removal of Suspended impurities, Method of Disinfection of water Wastewater: Introduction, Characteristics of Wastewater, need for Wastewater treatmem. Preliminary trestment Grit Chamber, Floatation, Skimming Tank, Screening Treatment: Sedimentation, Coagulation, Secondary treatment: Aerobic (Triskling filter, Activated sludge, Oxidation ponds and Lagoons), Anserobic (Septic tank, Sludge digestion and Disposal). Tertiary treatment: Aim, Need for Chlorination, Dose of chlorine, Ozotiaation

Recommended books :

1 Engineering chemistry: Wiley second edition
2. Environmental science, S.C. Santra, New Central Book Agency
3. A text book of environmental studies; D.K. Asthan, S. Chand & Camp Ltd.
4. Environmental studies, Dr. K. Mukkanti, S. Chand & Camp Ltd.
5.Water and waste water engineering, R.C. Rangwala
6.Water and wastewater engineering (Vol. II) Fair/ Geyer/ Okum
7. Methodology of water analysis; M.S. Kodarkar, IAAB Publication, Hyderabad
8.Wastewater engineering: Metcalf and Eddy, Inc. Pub
9. Chemical and biological method for water pollution, R.K. Trivedi and P.K. Geol, Environ: Pub

ADD-ON

CERTIFICATE COURSE

IN

MATHEMATICS FOR COMPETITIVE EXAMS

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Mathematics for Competitive Exams

Course Code: MATA001

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 10

Aim and Objective: The prime objective of the course is to gain knowledge and understanding of the fundamental concept, principal and techniques of basic mathematics .

Course Description: The course is best suited for students preparing for different entrance exams.

Details of Course:

Paper	Total Marks -50	Passing Marks
Mathematics for Competitive Exams	Attendance -10 Marks MCQ based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Mathematics for Competitive Exams"
Prepared by
Department of Mathematics
Sir P. T. Science College, Modasa
Course Co-Ordinator: Dr. K. N. Darji
Year: 2023-24
Date: 10-08-2023 to 28-08-2023

Unit 01: Set Theory

- Different types of sets
- Operations on sets
- Vab-Diagram
- Different Relations

Unit 02 : Functions

- Different types of functions
- One-One functions
- Onto functions
- Injective – Bijective functions

Unit 03: Trigonometry

- Identities and ratio
- Heights and Distances

Unit 04: Co-ordinate Geometry

- Co-ordinate Geometry

Books for Reference:

1. Set theory and related topic by Seymour Lipschutz, Mc Graw-Hill book, Singapor.
2. B. V. Mane, A text book of Engineering Mathematics, Everest Publishing House, 12 Edition 2003, Mumbai, India.

Course Outcome:

Students get knowledge about mathematical rules, formulas and techniques used for competitive examination. Students were aware with the short tricks to solve the problems asked in competitive examination which are time consuming by its usual methods of solving them.

ADD-ON

CERTIFICATE COURSE

IN

BASIC MATHEMATICS APTITUDE

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. U. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Basic Mathematics Aptitude

Course Code: MATAD02

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 100

Aim and Objective: The prime objective of the course is to remove the maths phobia prevalent in students and to generate their love for mathematics. The students and individuals who want to learn practical methods in order to become a maths whiz and gain a competitive edge.

Course Description: The course is best suited for students preparing for entrance exams where basic knowledge and mathematical techniques can help candidates to save valuable time and gain confidence in the examination. The course is also aimed for students whose aim is to crack competitive examinations in which basic knowledge of mathematics is required.

Details of Course:

Paper	Total Marks -50	Passing Marks
Basic Mathematics Aptitude	Attendance -10 Marks MCQ based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Pass-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Basic Mathematics Aptitude"
Prepared by
Department of Mathematics
Sir P. T. Science College, Modasa
Course Co-Ordinator: Dr. K. N. Darji
Year: 2023-24
Date: 01-09-2023 to 22-09-2023

Unit 01: Number System

- Numerals
- Face Value and Place Value of the Digits in a Number
- Types of Numbers
- Operations on Numbers
- Divisibility Tests Unit's Place of an Expression
- Basic Number Theory
-

Unit 02: Number Series

- Types of Series
- Types of Questions Asked on Number Series

Unit 03: HCF and LCM

- Factors and Multiples
- Least Common Multiple (LCM)
- Highest Common Factor(HCF)
- Method to Calculate LCM and HCF of Fractions
- Fast Track Techniques to Solve the Questions
- Method to Solve Questions Based on Bells

Unit 04: Simple and Decimal Fractions

- Simple Fraction
- Decimal Fraction
- Operations on Simple Fractions
- Operations on Decimal Fractions
- Comparison of Simple Fractions
- Fast Track Formulae to Solve the Questions

Books for Reference:

1. R. S. Agarwal, Quantitative Aptitude, Sultan Chand and Company Ltd, New Delhi,2012
2. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, McGraw Hill Education, 2011.
3. Rajesh Verma, Fast Track objective Arithmetic, Arihant Publication India Ltd

Course Outcome(s)

Students get knowledge about mathematical rules, formulae and techniques used for competitive examination. Students were aware with the short tricks to solve the problems asked in competitive examination which are time consuming by its usual methods of solving them.

ADD-ON

CERTIFICATE COURSE

IN

QUANTITATIVE APTITUDE SKILLS

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Quantitative Aptitude Skills

Course Code: MATAD03

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 15

Aim and Objective: The prime objective of the course is to remove the maths phobia prevalent in students and to generate their love for mathematics. The students and individuals who want to learn practical methods in order to become a maths whiz and gain a competitive edge.

Course Description: The course is best suited for students preparing for entrance exams where basic knowledge and mathematical techniques can help candidates to save valuable time and gain confidence in the examination. The course is also suited for students whose aim is to crack competitive examinations in which basic knowledge of mathematics is required.

Details of Course:

Paper	Total Marks -50	Passing Marks
Quantitative Aptitude Skills	Attendance -10 Marks MCQ based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Quantitative Aptitude Skills"
Prepared by
Department of Mathematics
Sir P. T. Science College, Modasa
Course Co-Ordinator: Dr. K. N. Darji
Year: 2023-24
Date: 03-10-2023 to 27-10-2023

Unit 01: Percentage

- Percentage
- Formulae to Calculate Percentage
- Fast Track Techniques to Solve the Questions

Unit 02: Profit and Loss

- Basic Formulae Related to Profit and Loss
- Fast Track Techniques to Solve die Questions

Unit 03: Simple Interest

- Simple Interest (SI)
- Instalments
- Fast Track Techniques to Solve die Questions

Unit 04: Compound Interest

- Basic Formulae Related Compound Interest
- Instalments
- Fast Track Techniques to Solve die Questions

Books for Reference:

1. R. S. Agarwal, Quantitative Aptitude, Sultan Chand and Company Ltd, New Delhi,2012
2. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, McGraw Hill Education, 2011.
3. Rajesh Verma, Fast Track objective Arithmetic, Arihant Publication India Ltd

Course Outcomes:

Students get knowledge about mathematical rules, formulae and techniques used for competitive examination. Students were aware with the short tricks to solve the problems asked in competitive examination which are time consuming by its usual methods of solving them.

ADD-ON

CERTIFICATE COURSE

IN

BASIC OF VEDIC MATHEMATICS

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-38331

Course Type: Add-On Certificate Course

Course Name: Basic of Vedic Mathematics

Course Code: MATA004

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 10

Aim and Objective: Vedic Math aims to enhance mathematical proficiency and problem-solving skills. Course offers innovative methods and shortcuts for performing various mathematical operations, emphasizing mental calculation and a deeper understanding of mathematical principles.

Course Description: The course is best suited for students preparing for entrance exams where basic knowledge and mathematical techniques can help candidates to save valuable time and gain confidence in the examination. The course is also suited for students whose aim is to crack competitive examinations in which basic knowledge of mathematics is required.

Details of Course:

Paper	Total Marks -50	Passing Marks
Basic of Vedic Mathematics	Attendance -10 Marks MCQ based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Basic of Vedic Mathematics"
Prepared by
Department of Mathematics
Sir P. T. Science College, Modasa
Course Co-Ordinator: Dr. V. R. Patel
Year: 2023-24
Date: 04-12-2023 to 29-12-2023

Unit 01 : Introduction to Vedic Maths

- History of Vedic Maths
- About the Father of Vedic Maths
- Features of Vedic Maths

Unit 02 : Vedic Maths Formulae

- Vedic Maths – 16 sutras
- Vedic Maths – 13 sub-sutras

Unit 03 : High Speed Addition

- Addition without carrying – 2x2, 2x3,2x4……2x10 (rows/columns)
- Addition using dot method - 2x2, 3x3, 4x4,……..10x10 (rows/columns)
- Addition using dot method – random digits

Unit 04 : Super Fast Subtraction

- Subtraction using All from 9 last from 10 (Nikhilam Navatascaram Dashtah)
- Subtraction using appropriate base 1-Digit number (base 10) 2-Digit numbers (base 100) 3-Digit numbers (base 1000) 4-Digit numbers (base 10000) 5-Digit numbers (base 100000) 6-Digit numbers (base 1000000) 7-Digit numbers (base 10000000)

Books for Reference:

1. Fundamentals of Vedic Mathematics, A Workbook-Vidhya Vikram.
2. Dhaval Bhatiya, Vedic Mathematics-Made Easy, Second Edition, 2021.

Course Outcomes:

Vedic math is a system of learning maths for faster calculations with time-saving methods to get answers quickly developing the mental ability of learners and Vedic Maths Syllabus has the tricks and techniques to increase the speed in mathematics.

ADD-ON

CERTIFICATE COURSE

IN

Biophysical technique

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name: Biophysical technique**
- **Course Code: 23UGMICRO6**
- **Course Duration**: 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:15**
- **Aim and Objective: The goal of the biophysical chemist is to provide physical explanations for the ways in which important biological systems function**
- **Course Description: giving knowledge about biophysical tests**
- **Details of course:**

Paper	Total Marks	Passing Marks
Biophysical technique	100 marks mcq based test	33 marks

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"biophysical tecniques"

Prepared by

Department of Microbiology

Sir P. T. Science College, Modasa

Course Co-Ordinator:DR.K.M.PATEL

Year: 2023-24

DATE: 04-12-2023 TO 03-01-2024

(For the all UG students admitted from the academic year 2023-24)

Course Code: 23UGMICRO6

Course Duration: 30 Hours

UNIT -1 NMR Spectroscopy: Quantum model for spin 1/2 nuclei; Classical Model; FT-NMR, NMR spectrometer and pulse sequence, Chemical shift; J-coupling; Relaxation; Rates and mechanisms, Correlation time, Spin decoupling; NOE, Spin echo, Applications of NMR in macromolecules, Multi-dimensional NMR; COSY; TOCSY, Protein NMR; General Principles: Resonance Assignment.

X-Ray Crystallography; Types of lattices and symmetry, Scattering by atoms and molecules; Scattering in terms of Fourier transforms, Interference from sets of atoms and Bragg's Law, Reciprocal lattice and systematic absences, Electron density calculations and phase problem; Solutions to phase problem, Patterson function, Model building and Refinement.

UNIT - 2 Microscopy: Design and fundamental principles of light and fluorescence microscopes; the fundamental principles of transmission and scanning electron microscopy; sample preparation for microscope, diffraction-limited resolution of light microscopy; point spread function and its utility. Structure and function of a confocal laser scanning microscope; the principle and use of deconvolution in fluorescence microscopy.

Chromatography: TLC, Paper, Size exclusion, Ion exchange, Affinity, HPLC, capillary electrophoresis and their applications.

Recommended texts

1. Jackson, M. B. (2006) Molecular and Cellular Biophysics. Cambridge University Press

2. Chary, K. V. R. & Govil, G. (2008) NMR in Biological Systems. From Molecules to Human. Springer.

3. Drenth, J. (2010) Principles of Protein X-ray Crystallography. Springer.

ADD-ON

CERTIFICATE COURSE

IN

BIOSTATISTICS

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name: BIOSTATISTICS**
- **Course Code:** 23UGMICRO5
- **Course Duration**: 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:15**
- **Aim and Objective:**
- **Course Description:**
- **Details of course:**

Paper	Total Marks	Passing Marks
BIOSTATISTICS	**100 marks mcq based test**	**33 marks**

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

" BIOSTATISTICS"

Prepared by
Department of Microbiology
Sir P. T. Science College, Modasa
Course Co-Ordinator:PROF.N.D.CHARAN

Year: 2023-24

DATE:31-01-24 to 29-02-24

(For the all UG students admitted from the academic year 2023-2024)

(For the all UG students admitted from the academic year 2023-24)

(For the all UG students admitted from the academic year 2023-24)

Course Code: 23UGMICRO5

Course Duration: 30 Hours

UNIT-I :- PARAMETRIC STATISTICS (15 HOURS)

- Definition and scope, Organizing a statistical survey and presentation of
- statistically analysed information
- Basic statistical methods: Measures of central tendency, dispersion and standard
- error; Probability distributions: binomial, poisson and normal distribution
- Statistical significance: Hypothesis testing, types of error, level of significance,
- Student's t test, F test and Chi square goodness of fit
- Simple linear regression and correlation analysis

UNIT-II :- NONPARAMETRIC STATISTICS (15 HOURS)

- Comparing Parametric and Non parametric statistics, Rank test, F-max test, Mann
- –Whitney (U) test, and Sign test
- Applications of non parametric statistics in biological research
- Basic computing: MS Office ®, Internet
- Data base management, Use of computers in statistical analysis

REFERENCES:

1.Milton, J.S 1992 Statistical Methods in Biological and Health Science. McGraw-
Hill Inc, New York.

2. Schefler, W.C. 1963 Statistics for biological sciences. Addition - Wesely Publication Co., London.

3. Snedecor, G. Wand Cocham, W. G. 1967 Statistical Methods. Oxford Publication
Co., New Delhi.

4. Spiegel, M.R. 1981 Theory and problems of statistics, Schaum's Outline Series
McGraw -Hill International Book Co., Singapore.

5. Day R.A. 7th Edition. How to write and publish a scientific paper

ADD-ON

CERTIFICATE COURSE

IN

HEMATOLOGY

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name: HEMATOLOGY**
- **Course Code: 23UGMICRO4**
- **Course Duration**: 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:15**
- **Aim and Objective:** The haematology course aims to help the students understand and recognise the pathologies behind benign and malignant disorders of erythrocytes, leucocytes, thrombocytes and the bone marrow.
- **Course Description: To provide in depth knowledge about the pathology and pathophysiology of haematological disorders. To help the students, read and evaluate laboratory values from routine blood examination and be able to differentiate between pathologies.**
- **Details of course:**

Paper	Total Marks	Passing Marks
HEMATOLOGY	100 marks mcq based test	33 marks

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"HEMATOLOGY"

Prepared by

Department of Microbiology

Sir P. T. Science College, Modasa

Course Co-Ordinator:PROF.D.M.JOSHI

Year: 2023-24

DATE:01-01-2024 TO 25-01-2024

HEMATOLOGY

(For the all UG students admitted from the academic year 2023-2024)

Course Code: 23UGMICRO4

Course Duration: 30 Hours

UNIT I–Blood and it's components — 15 hours

A. Plasma And Serum
B. Red Blood Cell
C. White Blood Cells
D. Platelets

UNIT II– Blood transfusion and transfusion reaction — 15 hours

A. Collection, Storage And Transfusion Of Blood
B. Blood Grouping
C. Minor And Major Cross-Matching

REFERENCES

1.Medical Laboratory Technology: Procedure Manual for Routine Diagnostic Tests by Mukherjee, McGraw Hill Education

2. Textbook of medical laboratory technology by Godkar, Bhalani Publishing House

3. Clinical Microbiology Made Ridiculously Simple, GLADWIN,

4. Microbiology an Introduction By Tortora, Benjamin Cummings

5. Medical Microbiology by Kayser

6. Instant Notes In Biochemistry, Hoper

7. Instant Notes In Microbiology,

8. Oxford handbook of clinical and laboratory investigation by Provan

9. District laboratory practice in tropical country by Cheesbrough, Cambridge University Press

ADD-ON

CERTIFICATE COURSE

IN

RESEARCH METHODOLOGY

(EFFECTIVE FROM: ACADEMIC YEAR 2023-2024)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name:** Research Methodology
- **Course Code: 23UGMICRO3**
- **Course Duration**: 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:15**
- **Aim and Objective: giving knowledge about research and its methodologies.**

- **Course Description:** **Prepare a project proposal (to undertake a project) • organize and conduct research (advanced project) in a more appropriate manner • write a research report and thesis • write a research proposal (grants)**

- **Details of course:**

Paper	Total Marks	Passing Marks
Research Methodology	100 marks mcq based test	33 marks

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Research Methodology"

Prepared by

Department of Microbiology

Sir P. T. Science College, Modasa

Course Co-Ordinator:PROF.D.M.JOSHI

Year: 2023-24

DATE:01-01-2024 TO 25-01-2024

RESEARCH METHODOLOGY

(For the all UG students admitted from the academic year 2023-2024)

Course Code: 23UGMICRO3

Course Duration: 30 Hours

UNIT I– Research methodology

15 hours

A. Characteristics and types of scientific research
B. Basics of research methodology
C. Research and Experimental design
D. Method of Data collection

UNIT II– Scientific deliveries

15 hours

A. Scientific Deliveries and Communications: Writing Research proposal, Paper,
B. Thesis, Report and Citations
C. Citations, H-Index, I10-Index, Impact factor and selection criteria of scientific
D. journals for research publications
E. Presenting scientific research: Power point presentations, Posters, Flyers, etc.
F. Publication processes, Review Processes and Significance of scientific
G. Communications

References

1. Milton, J.S 1992 Statistical Methods in Biological and Health Science. McGraw-
Hill Inc, New York.
2. Schefler, W.C. 1963 Statistics for biological sciences. Addition - Wesely Publication Co., London.
3. Snedecor, G. Wand Cocham, W. G. 1967 Statistical Methods. Oxford Publication

Co., New Delhi.
4. Spiegel, M.R. 1981 Theory and problems of statistics, Schaum's Outline Series
McGraw -Hill International Book Co., Singapore.
5. Day R.A. 7th Edition. How to write and publish a scientific paper

ADD ON COURSE

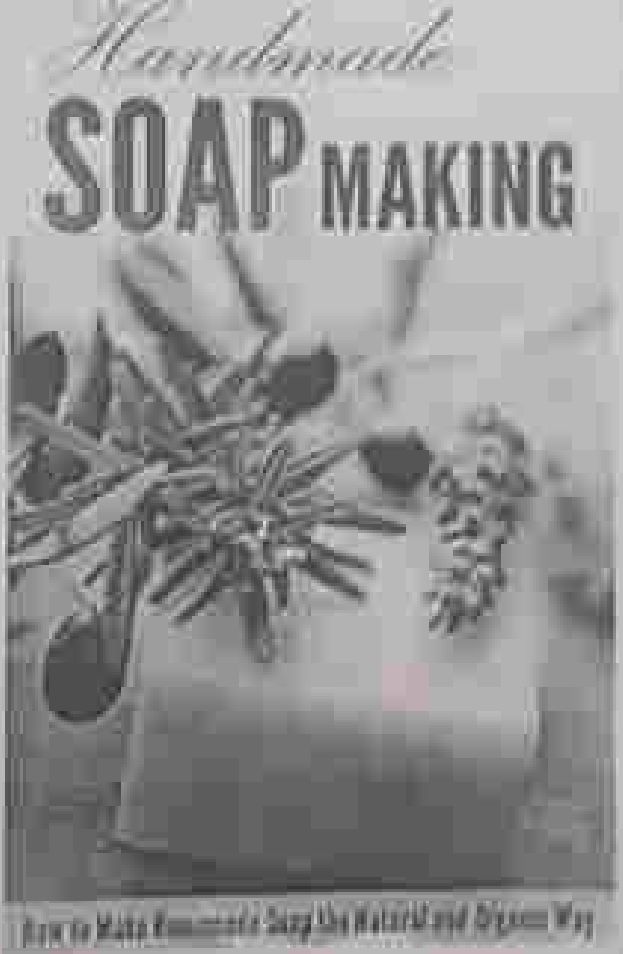
ON

"MANUFACTURING OF SOAP & DETERGENT"

DATE: 15-12-2022 to 02-01-2023

Duration: 30 Hours

Number of Total Students: 30



Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

Course Objectives:

- Discover the start-to-finish process of soap and detergent manufacturing with explanations of and machinery needed for metering, saponification, cooling, washing, neutralizing, drying, and finishing.
- Understand soap products' applications in the personal, fabric, and home care industries. And also understanding of oil, fat, and their sources in India.
- It will be more useful for students who are going to earn money by small business at home.

SIR P.T.SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee comprising by the following members was held on 15-11-2023 Tuesday at 02:00 pm to discuss the syllabus of add on course for Chemistry Department to be started in the college. The following members were present in the meeting.

The attached syllabus of 30 hours "ADD ON COURSE ON: "Manufacturing of Soap & Detergent" -2023 is approved by the committee after required discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P. PATEL	Principal	
2	Dr. S.D.DEVDA	Head of the Botany Department	
3	Dr. P.T.VEKARIA	IQAC Coordinator	
4	Dr. D.H.TUDANI	Head of the Chemistry Department	
5	Dr. R.L.Parmar	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P. GONDHALIA	PG In charge, Chemistry Department	
8	Dr. S. M. DAVE	Assistant Professor	
9	Dr. J. N. PATEL	Assistant Professor	

Course Co-ordinator: Dr. D. H. Tudani

Principal
Science College
MODASA

ADD ON COURSE ON "Manufacturing of Soap & Detergent"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15-12-2022 to 02-01-2023 Course Duration: 30 Hours

Course Syllabus

Unit: 1 Introduction to oil and fats: 4 Hours

1.1 Classification, structure and sources of oil and fats

1.2 Natural sources of oils and fats in India

Unit: 2 Soaps: 6 Hours

2.1 Introduction to soap, synthetic detergents, raw materials and its selection

2.2 Principles of soap making and chemistry of soap

2.3 Boiling, saponification process

Unit: 3 Detergents: 6 Hours

3.1 Types of detergents, classification of detergents (anionic, non-ionic, Amphoteric), biodegradability

3.2 Inorganic compounds of detergents (builder & other additives, phosphates, silicates, zeolites etc.

Unit: 4 Practical: 14 Hours

4.1 Determination of physico-chemical characteristics of oil and fats

i. Moisture content
ii. Acid value
iii. Iodine value
iv. Saponification reaction and Saponification value

4.2 Manufacture of liquid soap and laundry soap (detergent)

APPROVED SYLLABUS FOR ADD ON COURSE ON

"Manufacturing of Soap & Detergent" -2022

Prepared by

Department of Chemistry

Course Co-Ordinator: Dr. D. K. Fuldani

Year: 2022-23

Sir P. T. Science College, Modasa

Date: 15-12-2022 to 02-01-2023

Course Syllabus: (30 Hours)

Unit: 1 Introduction to oil and fats: 4 Hours

1.1 Classification, structure and sources of oil and fats

1.2 Natural sources of oils and fats in India

Unit: 2 Soap: 6 Hours

2.1 Introduction to soap, synthetic detergents, raw materials and its selection

2.2 Principles of soap making and chemistry of soap

2.3 Boiling, saponification process

Unit: 3 Detergents: 6 Hours

3.1 Types of detergents, classification of detergents (anionic, non-ionic, Amphoteric), biodegradability

3.2 Inorganic compounds of detergents (builder & other additives, phosphates, silicates, zeolites etc

Unit: 4 Practical: 14 Hours

4.1 Determination of physico-chemical characteristics of oil and fats

i. Moisture content
ii. Acid value
iii. Iodine value
iv Saponification reaction and Sapon fication value

4.2 Manufacture of liquid soap and laundry soap (detergent)

SIR P.T.SCIENCE COLLEGE, MODASA

ADD ON COURSE ON "Manufacturing of Soap & Detergent"

Organized by Department of Chemistry

Course Distribution (30 Hours)

Unit 1	1.1Classification, structure and sources of oil and fats 1.2Natural sources of oils and fats in India	4 Hours
Unit 2	2.1 Introduction to soap, synthetic detergents, raw materials and its selection 2.2 Principles of soap making and chemistry of soap 2.3 Boiling, saponification process	6 Hours
Unit 3	3.1 Types of detergents, classification of detergents (anionic, non-ionic, Amphoteric), biodegradability 3.2 Inorganic compounds of detergents (builder & other additives, phosphates, silicates, zeolites etc.	6 Hours
Unit 4	4.1 Determination of physico-chemical characteristics of oil and fats i. Find out the moisture value in different oil ii. To determine acid value of given oil sample iii. To determine iodine value in oils and fats iv. To determine saponification value in given oil	8 Hours
	4.2 Manufacture of liquid soap and laundry soap (detergent) a. Preparation of soap base b. Preparation of different type of soap from soap base c. Preparation of liquid detergent	6 Hours

ADD ON COURSE ON "Manufacturing of Soap & Detergent"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15-12-2023 to 02-01-2024

Registration Form

1. Name of Student:
2. Address:
3. E-mail ID:
4. Mobile Number:
5. Semester of Study:
6. Subject:
7. Roll No:
8. Academic Year:
9. Enrollment No:
10. Average of SGPA of all previous semesters:

Date:

Place: Modasa

Signature of Student

ADD-ON

CERTIFICATE COURSE

IN

MICROSOFT OFFICE EXCEL TOOLS USED IN MATHEMATICAL RESEARCH-I

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Microsoft Office Excel Tools used in Mathematical Research-I

Course Code: 22MATAD01

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 10

Aim and Objective: Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis.

Course Description: The course is best suited for students who want to gained their knowledge regarding Microsoft Office Excel Tools.

Details of Course:

Paper	Total Marks -50	Passing Marks
Microsoft Office Excel Tools used in Mathematical Research-I	Attendance -10 Marks Practical based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Microsoft Office Excel Tools used in Mathematical Research-I"

Prepared by
Department of Mathematics
Sir P. T. Science College, Modasa
Course Co-Ordinator: Dr. K. N. Darji
Year: 2022-23
Date: 13-09-2022 to 30-09-2022

Unit 01: Introduction to Excel

- Introduction to Excel interface
- Understanding rows and columns, Naming Cells
- Working with Excel workbook and sheets
- New, Open, Close, Save, Save As
- Formatting Text: Font Size, Font Style
- Font Color, Use Bold, Italic, and Underline
- Wrap text, Merge, and Centre
- Currency, Accounting, and other formats
- Modifying Columns, Rows & Cells

Unit 02 : Perform Calculations with Functions

- Creating Simple Formulas
- Setting up your own formula
- Date and Time Functions, Financial Functions
- Logical Functions, Lookup, and Reference
- Functions Mathematical Functions
- Statistical Functions, Text Functions

Unit 03: Plotting of Graphs

- Plotting graphs of trigonometric functions
- Plotting graphs of inverse trigonometric function
- Plotting graphs of Polynomial equations

Unit 04: Sort and filter data

- Using number filter, Text filter
- Custom filtering
- Removing filters from columns
- Conditional formatting

Books for Reference:

1. "Excel Spreadsheet Manual for Applied Mathematics" by Stela Pudar-Hozo,Indiana University Northwest, Pearson Publication.
2. "Microsoft Excel Data Analysis and Business Modeling" by Wayne L. Winston

Course Outcomes:

Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis. They should be able to use Excel for tasks like organizing data, generating charts, and performing basic statistical analyses.

ADD-ON

CERTIFICATE COURSE

IN

MICROSOFT OFFICE EXCEL TOOLS USED IN MATHEMATICAL RESEARCH-II

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Microsoft Office Excel Tools used in Mathematical Research-II

Course Code: 22MATAI002

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fee: Free of cost

Course Intake: 10

Aim and Objective: Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis.

Course Description: The course is best suited for students who want to gained their knowledge regarding Microsoft Office Excel Tools

Details of Course:

Paper	Total Marks -50	Passing Marks
Microsoft Office Excel Tools used in Mathematical Research-II	Attendance -10 Marks Practical based exam –40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Microsoft Office Excel Tools used in Mathematical Research-II"

Prepared by

Department of Mathematics

Sir P. T. Science College, Modasa

Course Co-Ordinator: Dr. V. R. Patel

Year: 2022-23

Date: 02-01-2023 to 30-01-2023

Unit 01: Create Effective Charts to Present Data Visually

- Inserting Columns, Pie charts, etc.
- Create an effective chart with Chart Tool
- Design, Format, and Layout options
- Adding chart title
- Changing layouts
- Chart styles
- Editing chart data range
- Editing data series
- Changing chart

Unit 02 : Solving Equations

- Using the Quadratic Formula
- Using SOLVER
- Solving Equations Using Graphs

Unit 03 : Functions

- Calculating Numerical Expressions
- Using Function Notation
- Creating Function
- Graphing Function
- Piecewise Functions
- Finding Intersection Points
- Finding Maximum and Minimum

Unit 04: Exponential and Logarithmic Functions

- Evaluating Powers of e
- Evaluating Expressions Involving Logarithms

Books for Reference:

1. "Excel Spreadsheet Manual for Applied Mathematics" by Stela Pudar-Hozo,Indiana University Northwest, Pearson Publication.
2. "Microsoft Excel Data Analysis and Business Modeling" by Wayne L. Winston

Course Outcomes:

Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis. They should be able to use Excel for tasks like organizing data, generating charts, and performing basic statistical analyses.

ADD-ON

CERTIFICATE COURSE

IN

MICROSOFT OFFICE WORD TOOLS USED IN MATHEMATICAL RESEARCH

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Microsoft Office Word Tools used in Mathematical Research

Course Code: 22MATAD03

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 10

Aim and Objective: Students should understand how to use Word features to structure and organize their mathematical research papers effectively.

Course Description: The course is best suited for students who want to gained their knowledge regarding Microsoft Office Word Tools

Details of Course:

Paper	Total Marks -50	Passing Marks
Microsoft Office Word Tools used in Mathematical Research	Attendance -10 Marks Practical based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPROVED SYLLABUS FOR ADD ON COURSE ON

"Microsoft Office Word Tools used in Mathematical Research"

Prepared by

Department of Mathematics

Sir P. T. Science College, Modasa

Course Co-Ordinator: Dr. K. N. Darji

Year: 2022-23

Date: 03-02-2023 to 04-03-2023

Unit 01: Text Basics for Math Type Equations and saving file

- Typing the text, Typing Math Type equations, Alignment of text
- Editing Text: Cut, Copy, Paste, Select All, Clear
- Find & Replace
- New, Open, Close, Save, Save As

Unit 02 : Text Formatting

- Formatting Text: Font Size, Font Style
- Font Color, Use Bold, Italic, and Underline
- Change the Text Case
- Line spacing, Paragraph spacing
- Shading text and paragraph
- Working with Tabs and Indents

Unit 03 : Working with Objects

- Shapes, Clipart and Picture, Word Art, Smart Art
- Columns and Orderings - To Add Columns to a Document
- Change the Order of Objects
- Page Number, Date & Time
- Inserting Text boxes
- Inserting Word art
- Inserting symbols
- Inserting Chart

Unit 04 : Working with Data Tables

- Working with Tables, Table Formatting
- Table Styles
- Alignment option
- Merge and split option * Headers & Footers

Books for Reference:

1. "Microsoft Word 2019 For Dummies" by Dan Gookin
2. "MathType Cookbook" by Richard L. Evans and W. J. "Jerry" Cody.

Course Outcomes:

Students should be able to create and format mathematical documents using Microsoft Word, including equations, symbols, and mathematical notation. They should understand how to use Word features to structure and organize their mathematical research papers effectively.

ADD-ON

CERTIFICATE COURSE

IN

MICROSOFT OFFICE EXCEL TOOLS USED IN MATHEMATICAL RESEARCH-I

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Microsoft Office Excel Tools used in Mathematical Research-I

Course Code: 22MATAD01

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 10

Aim and Objective: Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis.

Course Description: The course is best suited for students who want to gained their knowledge regarding Microsoft Office Excel Tools.

Details of Course:

Paper	Total Marks -50	Passing Marks
Microsoft Office Excel Tools used in Mathematical Research-I	Attendance -10 Marks Practical based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Microsoft Office Excel Tools used in Mathematical Research-I"

Prepared by
Department of Mathematics
Sir P. T. Science College, Modasa
Course Co-Ordinator: Dr. K. N. Darji
Year: 2022-23
Date: 13-09-2022 to 30-09-2022

Unit 01: Introduction to Excel

- Introduction to Excel interface
- Understanding rows and columns, Naming Cells
- Working with Excel workbook and sheets
- New, Open, Close, Save, Save As
- Formatting Text: Font Size, Font Style
- Font Color, Use Bold, Italic, and Underline
- Wrap text, Merge, and Centre
- Currency, Accounting, and other formats
- Modifying Columns, Rows & Cells

Unit 02 : Perform Calculations with Functions

- Creating Simple Formulas
- Setting up your own formula
- Date and Time Functions, Financial Functions
- Logical Functions, Lookup, and Reference
- Functions Mathematical Functions
- Statistical Functions, Text Functions

Unit 03: Plotting of Graphs

- Plotting graphs of trigonometric functions
- Plotting graphs of inverse trigonometric function
- Plotting graphs of Polynomial equations

Unit 04: Sort and filter data

- Using number filter, Text filter
- Custom filtering
- Removing filters from columns
- Conditional formatting

Books for Reference:

1. "Excel Spreadsheet Manual for Applied Mathematics" by Stela Pudar-Hozo,Indiana University Northwest, Pearson Publication.
2. "Microsoft Excel Data Analysis and Business Modeling" by Wayne L. Winston

Course Outcomes:

Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis. They should be able to use Excel for tasks like organizing data, generating charts, and performing basic statistical analyses.

ADD-ON

CERTIFICATE COURSE

IN

MICROSOFT OFFICE EXCEL TOOLS USED IN MATHEMATICAL RESEARCH-II

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Microsoft Office Excel Tools used in Mathematical Research-II

Course Code: 22MATAI002

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fee: Free of cost

Course Intake: 10

Aim and Objective: Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis.

Course Description: The course is best suited for students who want to gained their knowledge regarding Microsoft Office Excel Tools

Details of Course:

Paper	Total Marks -50	Passing Marks
Microsoft Office Excel Tools used in Mathematical Research-II	Attendance -10 Marks Practical based exam –40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

"Microsoft Office Excel Tools used in Mathematical Research-II"

Prepared by

Department of Mathematics

Sir P. T. Science College, Modasa

Course Co-Ordinator: Dr. V. R. Patel

Year: 2022-23

Date: 02-01-2023 to 30-01-2023

Unit 01: Create Effective Charts to Present Data Visually

- Inserting Columns, Pie charts, etc.
- Create an effective chart with Chart Tool
- Design, Format, and Layout options
- Adding chart title
- Changing layouts
- Chart styles
- Editing chart data range
- Editing data series
- Changing chart

Unit 02 : Solving Equations

- Using the Quadratic Formula
- Using SOLVER
- Solving Equations Using Graphs

Unit 03 : Functions

- Calculating Numerical Expressions
- Using Function Notation
- Creating Function
- Graphing Function
- Piecewise Functions
- Finding Intersection Points
- Finding Maximum and Minimum

Unit 04: Exponential and Logarithmic Functions

- Evaluating Powers of e
- Evaluating Expressions Involving Logarithms

Books for Reference:

1. "Excel Spreadsheet Manual for Applied Mathematics" by Stela Pudar-Hozo,Indiana University Northwest, Pearson Publication.
2. "Microsoft Excel Data Analysis and Business Modeling" by Wayne L. Winston

Course Outcomes:

Students should gain a good understanding of Excel functions and tools relevant to mathematical data analysis. They should be able to use Excel for tasks like organizing data, generating charts, and performing basic statistical analyses.

ADD-ON

CERTIFICATE COURSE

IN

MICROSOFT OFFICE WORD TOOLS USED IN MATHEMATICAL RESEARCH

(EFFECTIVE FROM: ACADEMIC YEAR 2022-2023)

Organized By

DEPARTMENT OF MATHEMATICS

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA

COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

Course Type: Add-On Certificate Course

Course Name: Microsoft Office Word Tools used in Mathematical Research

Course Code: 22MATAD03

Course Duration: 30 hours (Teaching will be conducted in week-end or in morning hours)

Eligibility Criteria: 12th Pass from any stream

Course Fees: Free of cost

Course Intake: 10

Aim and Objective: Students should understand how to use Word features to structure and organize their mathematical research papers effectively.

Course Description: The course is best suited for students who want to gained their knowledge regarding Microsoft Office Word Tools

Details of Course:

Paper	Total Marks -50	Passing Marks
Microsoft Office Word Tools used in Mathematical Research	Attendance -10 Marks Practical based exam -40 marks	40% of Total Marks (20 Marks)

Grade System:

Percentage of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPROVED SYLLABUS FOR ADD ON COURSE ON

"Microsoft Office Word Tools used in Mathematical Research"

Prepared by

Department of Mathematics

Sir P. T. Science College, Modasa

Course Co-Ordinator: Dr. K. N. Darji

Year: 2022-23

Date: 03-02-2023 to 04-03-2023

Unit 01: Text Basics for Math Type Equations and saving file

- Typing the text, Typing Math Type equations, Alignment of text
- Editing Text: Cut, Copy, Paste, Select All, Clear
- Find & Replace
- New, Open, Close, Save, Save As

Unit 02 : Text Formatting

- Formatting Text: Font Size, Font Style
- Font Color, Use Bold, Italic, and Underline
- Change the Text Case
- Line spacing, Paragraph spacing
- Shading text and paragraph
- Working with Tabs and Indents

Unit 03 : Working with Objects

- Shapes, Clipart and Picture, Word Art, Smart Art
- Columns and Orderings - To Add Columns to a Document
- Change the Order of Objects
- Page Number, Date & Time
- Inserting Text boxes
- Inserting Word art
- Inserting symbols
- Inserting Chart

Unit 04 : Working with Data Tables

- Working with Tables, Table Formatting
- Table Styles
- Alignment option
- Merge and split option * Headers & Footers

Books for Reference:

1. "Microsoft Word 2019 For Dummies" by Dan Gookin
2. "MathType Cookbook" by Richard L. Evans and W. J. "Jerry" Cody.

Course Outcomes:

Students should be able to create and format mathematical documents using Microsoft Word, including equations, symbols, and mathematical notation. They should understand how to use Word features to structure and organize their mathematical research papers effectively.

Sir P. T. Science College, Modasa

SYLLABUS FOR ADD-ON CERTIFICATE COURSE

ON

Biodiversity and Forest Conservation

(EFFECTIVE FROM THE ACADEMIC SESSION 2022-23)

P. G. CENTER IN BOTANY

DEPARTMENT OF BOTANY

Principal
Sir P. T. Science College
Modasa

► Course Code: BOTBFC 1

► Year of Establishment: 2022

► Course Duration: 30 hours

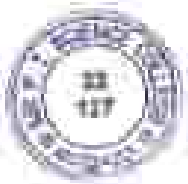
► Entry Requirement : 12th pass (Science) or

B.Sc. Student

► Course Fees: NIL

► Course offered by: Department of Botany

► Seat Availability: 25

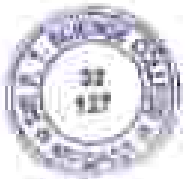


♣ Course Description:

This Course aims to raise awareness of the threats and challenges faced by forest and biodiversity to promote efforts for biodiversity and forest conservation and also for sustainable development. Preserving forest biodiversity will help us fight the climate crisis alleviate poverty, support human health.

Objectives:

- To educate students about nature conservation, forestry and forest.
- Creation of environmental awareness among all sectors of people.
- Creating awareness for protection and conservation of flora, fauna, forests and wildlife, biodiversity conservation.
- To promote the efficient use of forest resources.
- To provide long-term forest productivity and conservation of forest resources through reforestation, soil conservation, a forestation etc.
- Wildlife Habitat Management for In-situ and Ex-situ Conservation of wildlife.



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Sir P. T. Science College

► To protect water quality in streams, lakes, and other water bodies.

Course Outcomes:

►Students will be competent in basic forest management principles and evaluation of forest stands for health, wildlife habitat.

►Students will understand how the environment influences plant growth and crop yields, and ways to modify the environment to improve plant growth and yields.

►Students will be able to identify soil types and how they are formed and ways to modify soil structure and drainage to reduce erosion and improve water quality.

►Students will be able to know and Explain biodiversity, its threats and conservation methods Gain in-depth knowledge on natural processes that sustain life. Predict the consequences of human actions on the web of life, global economy and quality of human life.

►Students will be able to develop critical thinking for determining strategies for environmental protection and conservation of biodiversity and sustainable development.

►Students will be able to participate actively in solving current environmental problems and preventing the future ones.

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►Students will be able to adopt sustainability as a practice in life

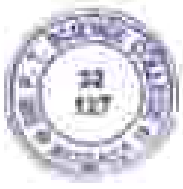
Syllabus: Curriculum Basic certificate course in Biodiversity and Forest Conservation

•Unit- 1. Introduction to Biodiversity: Biodiversity: Species, genetic and ecosystem diversity, levels of biodiversity, Importance and biodiversity indices, values of biodiversity, hotspots of biodiversity, Factors Responsible for Loss of Biodiversity, Preservation and Conservation Strategies for Biodiversity. Endemic species and Endangered Species.

•Unit-2: Biodiversity conservation Biodiversity Conservation: 'Ex-Situ' Conservation, 'In-Situ' Conservation, Restoration of Wilderness and Green Cover, Methods of Conservation, Education awareness, biodiversity act 2002, Biological diversity rules, 2004.

•Unit-3: Introduction to Forest Forest: Introduction, Classification and Importance of Forest. Introduction to Silviculture, Plant Growth Factors, Ecological Succession. Forest Soil: Soil and Soil Profile, Major soil types. Deforestation: Factors leading to deforestation and effects of deforestation.

•Unit- 4: Forest Conservation Forest Measurement: Tree Form, Measurement of tree attributes, Community Based Forestry: Concept, scope, need and objectives of



Sir P. T. Science College, Modasa

SYLLABUS FOR ADD-ON CERTIFICATE COURSE

ON

ENVIRONMENT STUIDES

(EFFECTIVE FROM THE ACADEMIC SESSION 2022-23)

P. G. CENTER IN BOTANY

DEPARTMENT OF BOTANY

Principal
Sir P. T. Science College
Modasa

- Course Code: BOTES
- Year : 2022
- Course Duration: 3 Months
- Eligibility : 12th pass (Science) or B. Sc. Student
- Hours: Theory – 16 Hours
  Practical – 14 Hours
- Course Fees: Rs. 150/-
- Course offered by: Department of Botany
- Seat Availability: 25

Introduction

The environment is an important determinant of health and has a profound impact on why some people are healthy and others are not. Environmental determinants of health and disease are pervasive and integral to the assessment, diagnosis, intervention, planning, and evaluation components of nursing practice. However, environmental factors that affect health are commonly overlooked in routine patient assessments. When environmental health concerns are missed, an opportunity for prevention is lost, and public health is less well served. The code suggests that as part of ethical practice, registered nurses may undertake the ethical Endeavour's of "supporting environmental preservation and restoration and advocating for initiatives that reduce environmentally harmful practices in order to promote health and wellbeing" and "maintaining awareness of broader global health concerns such as environmental pollution.

Goals :

1. Able to understand about earth processes, alternative energy system, pollution control and mitigation, natural resource management.

2. Able to know about biodiversity and its conservation, social issues and the environment, human population and the environment

3. To do the field work – to visit a local area to document environmental assets, polluted site, to study on common plants, insects, birds, and to study on simple ecosystem.

Course objectives:

On completion of this course the learner will be able to

- Identify the multidisciplinary nature of environmental studies
- Enumerate the renewable and non-renewable resources
- Express their knowledge on ecosystem
- Explain biodiversity and its conservation
- Identify the causes, effects and control measures of environmental pollution
- Find out the different types of social issues and environmental legislation
- Explain regarding effects of environment on human health
- Demonstrate their skills in doing field work

Scope :

In today's world because of industrialization and increasing population, the natural resources has been rapidly utilized and our environment is being increasingly

degraded by human activities, so we need to protect the environment. It is not only the duty of government but also the people to take active role for protecting the environment, so protecting our environment is economically more viable than cleaning it up once, it is damaged. The role of mass media such as newspapers, radio, television, etc is also very important to make people aware regarding **environment.**

Course Overview:

This course on environmental studies

Unit	Content	Theory Hours	Practical Hours
I	Multidisciplinary nature of environmental studies	2	1
II	Natural Resources	3	2
III	Ecosystems	2	1
IV	Biodiversity and Its Conservation	2	1
V	Environmental Pollution	2	1
VI	Social issues and the Environment	3	1
VII	Human Population and The Environment	2	1
VIII	Field Work		6

Process of Continuous Assessment and Grading:

It will be based on the following:

► Attendance of the students

► Continuous assessment in both theoretical class and practical

►Multiple Choice Questions

Principal

► Viva – voce

► Project report

Examination Pattern:

- Multipal Choice Question – 10 Marks
- Viva-voce – 10 marks
- Field work – 20 marks

Total marks: 40

Gradation Pattern:

Percentage of marks obtained	Grade
90 -100	Excellent -A+
70-89	Very Good - A
50-69	Good -B
40 -49	Fair – C
Below 40	Not Eligible for Certificate - D

ADD ON COURSE

ON

"Food Adulteration"

DATE: 15-12-2022 to 02-01-2023

Duration: 30 Hours

Number of Total Students: 30

Organized By:

DEPARTMENT OF CHEMISTRY

SIR P.T.SCIENCE COLLEGE, MODASA

Course Objectives:

i. To aware students about basic idea on various foods and about adulteration.
ii. To know about adulteration of common foods and their adverse impact on health
iii. To develop the skills of detecting adulteration of common foods.
iv. To able to extend their knowledge for remedial measures for common food adulterants.

SHRI P.T. SCIENCE COLLEGE, MODASA

Minutes

A meeting of the committee consisting by the following members was held on 28.11.2022, Wednesday at 02.00 pm to prepare the syllabus of add on course in Chemistry Department to be started in the college. The following members were present in this meeting.

The drafted syllabus of 30 hours "**Add ON COURSE On "Food Adulteration" 2023**" is discussed by the committee after intensive discussion.

Sr. No.	Name of Members	Designation	Signature
1	Dr. K.P.PATEL	Principal	
2	Dr. S.J.SWETHA	Head of the Botany Department	
3	Dr. G.J.VYAS	IQAC Coordinator	
4	Dr. H.R.THAKAR	Head of the Chemistry Department	
5	Dr. B.D.PARMAR	Head of the Physics Department	
6	Dr. S.V.PATEL	Associate Professor	
7	Dr. M.P.GONGHWALA	PG in charge Chemistry Department	
8	Dr. S. M. DAVE	Assistant Professor	
9	Dr. J. N. PATEL	Assistant Professor	

Course Co-Ordinator: Dr. M.P. Gonghwala

Shri P. T. Science College
Modasa-383315

ADD ON COURSE ON "Food Adulteration" 2022-23"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15-12-2023 to 02-01-2023

Registration Details

No.	Roll No.	Student Name	Class	Signature
1	10	Parmar Dinnbkumar B.		
2	11	Patel Dishaben Sachinbhai		
3	12	Patel Divitaben Janakbhai		
4	13	Patel Hitanshee Sureshbhai		
5	14	Prajapati Divya S.		
6	15	Bhoi Janakben P.		
7	16	Patel Jasmin Narsinhbhai		
8	17	Rathod Jaykumar Jayantibhai		
9	18	Prajapati Kalyaniben N.		
10	20	Maheshwarri Khushbuben L.		
11	21	Belim Khushnumabanu M.		
12	22	Khant Kirankumar A.		
13	23	Vyas Mahendrakumar A.		
14	24	Patel Manisben Bakeshbhai		
15	26	Chauhan Parth Yogendrabhai		
16	27	Talar Piyushkumar B.		
17	28	Solanki Prabhatsinh R.		
18	29	Pagi Prakash N.		
19	30	Rajpal Pruthviraj V.		
20	31	Patel Purviben Sanjaykumar		
21	32	Desai Rachana Ishwarbhai		
22	33	Patel Rahul Gajabhai		
23	34	Chauhan Ranjit Udesinh		
24	35	Bilvala Upendra J.		
25	37	Valand Rituben Bhanuprasad		
26	38	Patel Sahilkumar H.		
27	39	Lalliana Samaribhai M.		
28	40	Zala Saurabkumar Ranjitsinh		
29	41	Patel Sakiben S.		
30	42	Prajapati Tusharkumar S.		

ADD ON COURSE ON "Food Adulteration"-2022-23"

Organized by Department of Chemistry

SIR P.T.SCIENCE COLLEGE, MODASA

Date: 15-12-2022 to 02-01-2023 **Course Duration: 30 Hours**

Course Syllabus

UNIT-I : Common Foods and Adulteration: **(07hrs)**

Common Foods subjected to Adulteration - Adulteration: Definition, Types: Poisonous substances, Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives - intentional and incidental. General impact on Human Health.

UNIT-II: Methods of Detecting Adulterants: **(10 hrs)**

Means of Adulteration Methods of Detection Adulterants in the following Foods: Milk, Coffee, Oil (Ghee), Grains pulses) , Sugar, Spices (Chili powder, turmeric, coriander)Â and condiments, Processed food, Fruits and vegetables.Analysis of preservative and coloring materials, test enhancing, sweetening flavoring materials (msg)

UNIT-III: Present Laws and Procedures on Adulteration: **(08hrs)**

Basic Highlights of Food Safety and Standards Act 2006 (FSSA) Food Safety and Standards Authority of India's Rules and Procedures of Local Authorities.
Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives
Consumer education, Consumer problems: rights and responsibilities, COPRA 2019 - Offenses and Penalties Procedures to Complain Compensation to Victims.

UNIT-IV -Recommended Co-curricular Activities (including Hands on Exercises): (05hrs)

1. Collection of information on adulteration of some common foods from local market
2. . Demonstration of Adulteration detection methods for a minimum of 5 common foods (one method each
3. Invited lecture/training by local expert
4. Assignments, Group discussion, Quiz etc.

Sir P.T. Science College
Modasa

APPROVED SYLLABUS FOR ADD ON COURSE ON

"Food Adulteration" - 2023

Prepared by

Department of Chemistry

Course Co-Ordinator: Dr. M.P. [illegible]

Year: 2022-23

Sir P. T. Science College, Modasa

Date: 15-12-2022 to 02-01-2023

Course Syllabus (30 Hours)

UNIT-I: Common Foods and Adulteration (05hrs)

Common foods subjected to adulteration - Adulteration: Definition; Types; Poisonous substances, Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through food additives – intentional and incidental. General impact on human health.

UNIT-II: Methods of Detecting Adulterants (10 hrs)

Means of Adulteration. Methods of Detection adulterants in the following foods: Milk, Coffee, Oil, Ghee, Grain, pulses, Sugar, Spices, Chili powder, Turmeric powder & [illegible] Condiments, Processed food, Fruits and vegetables. Analysis of preservatives and coloring materials, taste enhancing, sweetening, flavoring materials, etc.

UNIT-III: Present Laws and Procedures on Adulteration (05hrs)

Basic highlights of Food Safety and Standards Act 2006; FSSAI: Food Safety and Standards Authority of India; Rules and Procedures of Local Authorities.

Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives.

Consumer education, Consumer's problems rights and responsibilities, COPRA 2019. Offences and Penalties, Procedures to Complain, Compensation to Victims.

UNIT-IV: Recommended Co-curricular Activities (including hands on Exercises) (05hrs)

1. Collection of information on adulteration in some common foods from local market.

2. Demonstration of Adulteration detection methods for a minimum of 4 common foods (one method each).

3. Related activities (Seminar, local industry visits, Assignments, Group discussion, Quiz etc.)

ADD-ON

CERTIFICATE COURSE

IN

FOOD TECHNOLOGY

(EFFECTIVE FROM: ACADEMIC YEAR 2021-2022)

Organized By

DEPARTMENT OF MICROBIOLOGY

SIR P. T. SCIENCE COLLEGE, MODASA

MANAGED BY

THE M. L. GHANDHI HIGHER EDUCATION SOCIETY, MODASA COLLEGE CAMPUS, DHANSURA ROAD, MODASA, ARVALLI-383315

- **Course Type:** Add-On Certificate Course
- **Course Name:** FOOD TECHNOLOGY
- **Course Code:** 22UGMICR10
- **Course Duration:** 30 hours (Teaching will be conducted in week-end or in morning hours)
- **Eligibility Criteria:** 12th Pass from any stream
- **Course Fees:** Free of cost
- **Course Intake:10**
- **Aim and Objective:** To understand the history and evolution of food processing
    - To study the structure, composition, nutritional quality and post harvest changes of various plant foods.
    - To study the structure and composition of various animal foods.

- **Course Description:** **Food Technology course** is a branch of Engineering that deals with the techniques involved in the production, processing, preservation, packaging, labeling, quality management, and distribution of food products. The field also involves techniques and processes that transform raw materials into food. Extensive research goes behind making food items edible as well as nutritious.
- **Details of course:**

Paper	Total Marks	Passing Marks
FOOD TECHNOLOGY	**100 marks mcq based test**	**40 marks**

- **Grade system:**

Percentage Of Marks Obtained	Grade
90-100	Excellent-A+
70-89	Very Good-A
50-69	Good-B
40-49	Fair-C
Below 40	Not eligible for certificate-D

APPPROVED SYLLABUS FOR ADD ON COURSE ON

FOOD TECHNOLOGY

Prepared by
Department of Microbiology
Sir P. T. Science College, Modasa
Course Co-Ordinator:DR.K.K.PATEL
Year: 2021-22
DATE:01-01-21 to 29-01-21

(For the all UG students admitted from the academic year 2021-2022)

Course Code: 22UGMICRO10

Course Duration: 30 Hours

UNIT 1 Introduction (4 lectures)

Historical evolution of food processing technology.

UNIT 2 Compositional, Nutritional and Technological aspects of Plant foods

I. Cereals and Millets

Structure and composition of cereals

Wheat- structure and composition, types (hard, soft/ strong, weak)

Diagrammatic representation of longitudinal structure of wheat grain.

Malting, gelatinization of starch, types of browning- Maillard & caramelization.

Rice- structure and composition, parboiling of rice- advantages and disadvantages.

I. Pulses

Structure and composition of pulses, toxic constituents in pulses, processing of pulsessoaking, germination, decortications, cooking and fermentation.

II. Fats and Oils

Classification of lipids, types of fatty acids - saturated fatty acids, unsaturated fatty acids, essential fatty acids, trans fatty acids.

Refining of oils, types- steam refining, alkali refining, bleaching, steam deodorization, hydrogenation.

Rancidity –Types- hydrolytic and oxidative rancidity and its prevention.

IV. Fruits and Vegetables

Classification of fruits and vegetables, general composition, enzymatic browning, names
and sources of pigments, Dietary fibre.
Post harvest changes in fruits and vegetables – Climacteric rise, horticultural maturity,
physiological maturity, physiological changes, physical changes, chemical changes,
pathological changes during the storage of fruits and vegetables.

UNIT 3 Compositional, Nutritional and Technological aspects of Animal foods

1. Flesh Foods - Meat, Fish, Poultry

Meat - Definition of carcass, concept of red meat and white meat, composition of meat,
marbling, post-mortem changes in meat- rigor mortis, tenderization of meat, ageing of
meat.
Fish - Classification of fish (fresh water and marine), aquaculture , composition of fish,
characteristics of fresh fish, spoilage of fish- microbiological, physiological, biochemical.
Poultry - Structure of hen's egg, composition and nutritive value, egg proteins,
characteristics of fresh egg, deterioration of egg quality, difference between broiler and
layers.

REFERENCES

1. Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013
2. Roday,S. Food Science, Oxford publication, 2011.
3. B. Srilakshmi, Food science, New Age Publishers,2002
4. Meyer. Food Chemistry. New Age,2004
5. De Sukumar., Outlines of Dairy Technology, Oxford University Press, 2007

ADD ON COURSE

ON

HERBARIUM TECHNIQUES & METHODOLOGY

(EFFECTIVE FROM THE ACADEMIC SESSION 2022-23)

DEPARTMENT OF BOTANY

SIR P. T. SCIENCE COLLEGE, MODASA

Principal
Sir P. T. Science College
Modasa

Add on Course on Herbarium Techniques & Methodology

INTRODUCTION

Certificate Course on herbarium technique is a specially designed course for graduate students. The herbarium is defined as a storehouse of collected plant specimens. These plant specimens are dried, pressed, and are then preserved in sheets. These sheets are then stored and arranged in a sequence that is universally accepted by the system of classification. The herbarium techniques are part of taxonomical studies in botany.
A herbarium is a collection of preserved plant specimens that have been stored appropriately, databased and arranged systematically to ensure quick access to students, researchers and the general public for scientific research and education.

The herbarium is used as a repository for the study of plants specimen. Herbarium provides instant referrals in taxonomical studies. They give histological and geographical information about different plant species.

REQUIREMENTS:

• Student-participants: Internal (students of B.Sc. Botany)

• Teachers: Internal. Faculty members of Department of Botany. External faculty members, research scholars and scientists may be invited to conduct some classes depending on their willingness and availability.

• Course Fee: Nil.

• Intake Capacity: 20

•Time period of course: 30 days

• Class/Lecture duration: 1 hr

SCOPE

This subject is designed to impart fundamental knowledge on the herbarium and its methodology to preserve plant specimen for research and related field work. The subject emphasizes on the basic introduction and history of herbarium, different role and application of herbarium in research, types of herbaria, functions and importance of herbaria,

methodology and preparation of herbarium. The syllabus also emphasizes on survey, collection, identification and preservation of few important biological species.

OBJECTIVES

1. After completion, the students will have the following skills:
2. Understand the herbarium of history, role and applications.
3. The Ability to collect variety of Plant Specimens properly from different habitat.
4. Understand the different types of herbariums in use for academic and research.
5. Know the methodology and protocol to prepare the herbarium.
6. Study the survey, collection, identification and preservation of few important biological species.
7. The ability to preserve them properly including preparation of Herbarium Specimens and Jar Specimens along with the knowledge of preparing chemical solutions for this process.
8. The knowledge of Safety with special emphasis on Biohazardous chemicals.
9. The basic knowledge of incorporation and maintaining of specimens in a herbarium and museum with special reference to Digital Databases of Herbarium and Museum.

OUTCOME

After completion of the course the student were acquired with A herbarium is a collection of preserved plant specimens that have been stored appropriately, data based and arranged systematically to ensure quick access to students, researchers and the general public for scientific research and education.

SYLLABUS

Herbarium (T): Theory of Herbarium Preparation (15 Hours)

1. Introduction To Herbarium (2 Hours)

Introduction of herbarium, herbarium sheet, history, objective and role of herbarium in research and academics.

2. Types of herbarium (1 Hours)

Details of different types of herbaria, acronyms, functions of herbaria and few important herbaria of world and India.

3. Collection of specimens (2 Hours)

Field equipment, field work, field notebook, and details of collection process of specimen for herbarium.

4. Processing of specimen (4 Hours)

Details of poisoning, pressing, drying, mounting, stitching, leballing, identification and determination of plant, incorporation

5. Maintenance (2 Hours)

Introduction to different methods of maintenance of such as fumigation, heating, chemical treatment, etc.

6. Collection, preservation and identification of few important biological species (4 Hours)

Brief discussion on Collection, preservation and identification of few important species such Algae, wild mushrooms, and bryophytes.

Herbarium (P): Practical's of Herbarium Preparation (15 Hours)

1. Demonstration of Herbarium Technique (5 Hours)
2. Drying and Pressing (5 Hours)
3. Poisoning (5 Hours)

Process of Continuous Assessment and Grading:

It will be based on the following:

- ► Attendance of the students
- ► Continuous assessment in both theoretical class and practical
- ►Multiple Choice Questions
- ►Viva – voce

EXAMINATION PATTERN:

Multiple Choice Question – 10 Marks

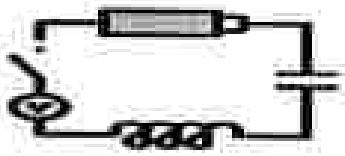
Viva-voce – 10 marks

Field work – 20 marks

Total marks: 40

Add-on Course on "BASIC ELECTRONICS TRAINING"

Registration Fee: Free **Last date: 15 Nov 2022**



Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have a basic understanding of algebra and mathematics.
- Interested in learning electricity and electronics.
- Own a scientific calculator.

Description

"The BASIC ELECTRONICS TRAINING" makes electronics easy!

This course includes Practical's and text explanations of everything in electricity and electronics, and it includes more than 8 Experiments with easy-to-understand explanations. **"BASIC ELECTRONICS TRAINING"** Course' is organized into four sections:

- Basic concepts
- Basic laws
- Methods of analysis
- Experiments

Who this course is for:

- First year students of B Sc..
- University, college or school students taking an electricity or electronics course.
- Anyone interested in gaining mastery of the core concepts of electrical and electronic Sciences.

For Certification require fulfillments evaluation and presence

Course Duration: 30 contacts **Course Commencement From 1st December 2022**

Course Coordinator:- Prof Girish Vekaria **HOD:-Dr R H Parmar**

P. T. SCIENCE COLLEGE 32 127 MODASA

Principal

Modasa-383315, Dist.Aravalli.

Add-on Course on " LED BULB , USAGE AND APPLICATIONS".

Registration Fee: Free **Last date: 10 Aug 2022**

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have a basic understanding of algebra and mathematics.
- Interested in learning electricity and electronics.
- Own a scientific calculator.

Description

" LED BULB , USAGE AND APPLICATIONS" **makes electronics easy!**

This course includes Practical's and text explanations of everything in electricity and electronics, and it includes more than 8 Experiments with easy-to-understand explanations. " LED BULB , USAGE AND APPLICATIONS" Course' is organized into four sections:

- Basic concepts
- Basic laws
- Methods of analysis
- Experiments

Who this course is for:

- First year students of B Sc.
- University, college or school students taking an electricity or electronics course.
- Anyone interested in gaining mastery of the core concepts of electrical and electronic Sciences.

For Certification require fulfillments evaluation and presence

Course Duration: 30 contacts **Course Commencement From 16th August 2022**

Course Coordinator:- Prof Girish Vekaria **HOD:-Dr R H Parmar**

P. T. SCIENCE COLLEGE 32 127 MODASA

Sir P. T. Science College
Modasa-383315,Dist.Aravalli.

Aims of the programme:

- To develop the skills required to gather information from resources and use them.
- To provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
- To give need based education in physics of the highest quality at the undergraduate level.
- To offer courses to the choice of the students.
- To enable students to perform experiments and interpret the results of observation, including an assessment of experimental uncertainties.

Objectives:

By the end of the add on Course on "The BASIC ELECTRONICS TRAINING the students should have attained a common level in basic of Electronics Circuit physics to complement the core for their future courses and developed their experimental and data analysis skills through experiments at laboratories.

SYLLABUS

Module 1 : Electronics & Electrical Components Identification

Vacuum tubes – Resistors- Capacitors- Batteries- switches-Diodes – Transistors – Integrated chips – Bread board – voltage supplies- multimeters

Module 2 : Uses of Electronics components for basics Electronic devices

Use of resistors and capacitors in a circuit- charging and discharging of capacitors- Uses of transistors transistor connections- Uses of diodes- filter circuits- zener diodes- voltage regulators

Module 3 : Cathode Ray Oscilloscope operations

Identification of CRO knobs- Testing of CRO and PROBES- Measurements using CRO- Familiarization of Function Generators- Operation of Function Generator

Module 4 : Skill Development

Soldering of electronic components – full wave & bridge rectifiers – power pack – manufacturing of LED bulbs

Books For Reference

1. Basic Electrical Engineering – V.K Mehta & Rohit Mehta (2008) – S.Chand publishers
2. Electrical Technology – Volume I – B.L Theraja S.Chand publishers
3. Malvino Electronic Principles (1999) sixth edition – Albert Paul Malvino – Tata Mcgraw Hills publishers

S.P.T. SCIENCE COLLEGE MODASA 32 107

Sir P. T. Science College
Modasa-383315, Gujarat

Aims of the programme:

- To develop the skills required to gather information from resources and use them.
- To provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
- To give need based education in physics of the highest quality at the undergraduate level.
- To offer courses to the choice of the students.
- To enable students to perform experiments and interpret the results of observation, including an assessment of experimental uncertainties.

Objectives:

By the end of the add on Course on " LED BULB , USAGE AND APPLICATIONS", the students should have attained a common level in basic of Electric Circuit physics to complement the core for their future courses and developed their experimental and data analysis skills through experiments at laboratories.

SYLLABUS

MODULE I 10 hours

Diodes- basic concepts, Biasing-forward bias and reverse bias, Introduction to LEDs, Semiconductor LEDs- How do they Work, LED's basic theory, LED Voltage Voltage and current, Advantages and disadvantages of LED

MODULE II 10 hours

Multicolour LEDs, White LED, Physics of White LED, White LED no heat, Blue LED- History of Revolutions, LEDs Lighting and Potential for energy savings, Applications of LEDs- Power indicator, seven segment display, why LED lights so good, Organic LEDs

MODULE III – Practical Session 10 hours

How to assemble LED bulbs , Discussion of the circuits , Fabrication of the LED bulbs

Text book for study

1. Principles of Electronics- V.K Metha- S . Chand Publication
2. Principles and Applications of Organic Light Emitting Diodes (OLEDs)- Thejo Kalyani, Hendrik Swart and S. J. Dhoble-Wiley Publication
3. Understanding LED Illumination – M. Nisa Khan
4. Integrated Electronics- Jacob Millman ,Christos Halkias ,Chetan D. Parikh- second edition

Add-on Course on Fundamentals of Computer

Registration Fee: Free **Last date: 1 July 2022**

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have a basic understanding of basic of computers.
- Interested in learning computer.

Description

" **Computer** " makes daily work easy!

This course includes Practicals and text explanations [illegible] **Fundamentals** of Computer, and [illegible] with [illegible] explanations. **Fundamentals of Computer Course** is organized into four sections:

- ➢ Basic concepts
- ➢ Basic laws
- ➢ Methods of analysis
- ➢ Experiments

Who this course is for:

- First/Second year students of M.Sc.
- University, college or school students taking a **Fundamentals of Computer Course**.
- Anyone interested in gaining mastery of the core concepts of Computer Sciences.

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Add on Course on Nano Satellite Design

Registration Fee: Free **Last date:** 10 July 2022

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have a basic understanding of algebra and mathematics
- Interested in learning electricity and electronics
- Own a scientific calculator

Description

"The Electric Circuit Analysis Course" makes electricity and electronics calculations easy!

This course includes Practical's and text explanations of everything in electricity and electronics and it includes more than 8 Experiments with easy-to-understand explanations. The "Electric Circuit Analysis Course" is organized into four sections:

- Basic concepts
- Basic laws
- Methods of analysis
- Experiments

Who this course is for:

- First year students of B.Sc.
- University college or school students taking an electricity or electronics course
- Anyone interested in gaining mastery of the core concepts of electrical and electronic Sciences

For Certification require fulfillment evaluation and presence

Course Duration: 30 contact **Course Commencement From 20th July 2022**

Course Coordinator:- Prof Girish Vekaria **HOD:-Dr R H Parmar**

Aims of the programme:

- To develop the skills required to gather information from resources and use them.
- To provide an intellectually stimulating environment to develop skills and enthusiasm of students to the best of their potential.
- To give need based education in physics of the highest quality at the undergraduate level.
- To offer courses to the choice of the students.
- To enable students to perform experiments and interpret the results of observation, including an assessment of experimental uncertainties.

Objectives:

- To offer a simplified and increased exposure to satellite fabrication technologies, Nano satellite missions
- To provide theoretical course on satellite technology
- To provide intensive course on nano satellite realization, covering mission aspects, design, fabrication, assembly, integration & testing
- To provide hands-on training to assemble, integrate and test a nano satellite

The major topics covered in this module include:

- Nano satellite definition
- Features of Nano satellite and its comparison with large satellite
- Nano satellite Applications
- Nano satellite and laws governing their impact on space debris
- Design drivers for a Nano satellite
- Familiarization exercise with nanosatellite systems
- Reliability & Quality Assurance
- Nano satellite configuration exercise (assigned to the individual group)

Hands-on training on nano satellite assembly, integration and testing. The major topics covered in this module include:

- Introduction to assembly, integration and testing satellites
- Major milestones of spacecraft integration and their importance
- Documents related to AIT activities
- Handling procedures for spacecraft systems
- Inventory checks (mechanical and electrical) and their importance
- AIT sequence

OBJECTIVE : The course is designed to aim at imparting a basic level appreciation programme for the common man. After completing the course the individual is able to the use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails etc. This allows a common man or housewife to be also a part of computer users list by making them digitally literate. This would also aid the PC penetration program. This helps the small business communities, housewives to maintain their small accounts using the computers and enjoy in the world of Information Technology.

Fundamentals of Computer

MICROSOFT WORD

Starting word: Word processor basics, word wrapping, adding or deleting text, Selecting block of text, Copying text, Moving text, search and replace, editing a document, character formatting and style, Margin settings and columns, Justification of text, Line spacing, Setting tabs, Automatic tasks, Creating letters in readymade formats, Change case, Borders and Shading, Bullets and Numbering, Spelling and Grammar checking, Clip Art, Creating Drawing in the Toolbars, Auto correct, Auto Text, Printing a document, Short Keys, Help.

Menus in Microsoft word: Menus, Menu bar, Toolbar, Table etc.

WINDOWS AND POWER POINT

Basic features and simple commands of operating system windows will be used. Accessories: Notepad, Calculator, Disk cleanup, Disk defragmentation, Windows explorer, Control panel. Starting power point, creating presentations, creating presentation using templates, creating blank presentations, Formatting slide, Animation (Transition), slide show, quitting power point.

For Certification require fulfillments evaluation and presence

Course Duration: 30 contacts **Course Commencement : From 2nd July 2022**

Course Coordinator: Dr R H Parmar

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Add-on Course on Mathematica Software

Registration Fee: Free **Last date:** 30 June 2023

Wolfram Mathematica

SIR P. T. SCIENCE COLLEGE 32 127

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have some understanding of basic computer.
- Interested to learn in computer.

Description

For Modern Technical Computing Mathematica Software only!

This course includes Practical's and text explanation of everything in **Mathematica Software**, and it includes more than 5 Experiments with well-illustrated explanations. **'The Mathematica Software Course'** is organized into four sections:

- Basic Concepts
- Basic laws
- Methods of analysis
- Experiments

Who this course is for:

- First / Second year students of M.Sc.
- University, college or school students taking a **Micro Soft Office Course**.
- Anyone interested in gaining mastery of the core concepts of Computer Science.

Course Contain:

Course Duration: 30 contacts **Course Commencement: From 2nd August 2023**

Course Coordinator: Dr R H Parmar

Add on Course on Electronics Instruments and Circuit

Registration Fee: Free **Last date: 30 July 2023**

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have a basic understanding of algebra and mathematics.
- Interested in learning electricity and electronics.
- Own a Scientific Multi-meter.

Description

Various electronic measurement applications range from scientific research to industrial quality control. In scientific research, electronic measurements are used to study the behavior of particles and waves and test theories and models. Industrial quality control applications use electronic measurements to ensure that products meet specifications and standards. Other common applications include measuring the performance of electronic devices and circuits and troubleshooting and repairing electronic equipment.

This course includes Practical's and test explanations of everything in electricity and electronics and it includes more than [illegible] Experiments with easy-to-understand explanations. The Electronics Instruments and Circuits course is organized into four sections:

- Basic concepts
- Basic Constructions of electronics
- Characteristics and Applications
- Experiments

Who this course is for:

- First year students of B.Sc.
- University, college or school students taking an electricity or electronics course.

- Anyone interested in getting acquainted with concepts of classical and electronic Science.

Aims of the programme:

- To develop the skills required to gather information from resources and use them.
- To provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
- To give need based education in physics of the highest quality at the undergraduate level.
- To offer courses to the choice of the students.
- To enable students to perform experiments and interpret the results of observation, including an assessment of experimental uncertainties.

Objectives

By the end of the add on Course on Electronics Circuit Analysis the students should have attained a common level in basic of Electronics Circuit to complement the core for their future courses and developed their experimental and data analysis skills through experiments at laboratories.

Electronics Instruments and Circuit

Week 1 : Metal-Semiconductor (MS) Junctions

Week 2 : PN junctions

Week 3 : Bipolar Junction Transistor (BJT)

Week 4 : Measuring of Electronics Instruments

For Certification require fulfillments evaluation and presence

Course Duration: 30 contacts **Course Commencement From 1st August 2025**

Course Coordinator:- Prof Girish Vekaria **HOD:- Dr R H Parmar**

Add-on Course on Electric Circuit Analysis

Registration Fee: Free **Last date: 30 July 2023**

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- Have a basic understanding of algebra and mathematics.
- Interested in learning electricity and electronics.
- Own a scientific calculator.

Description

"The Electric Circuit Analysis Course" makes electricity and electronics calculations easy

This course includes [illegible] and text explanations of everything in electricity and electronics, [illegible] understand explanations. The Electric Circuit Analysis Course is organised into four sections:

- Basic concepts
- Basic laws
- Methods of analysis
- Experiments

Who this course is for:

- First year students of B.Sc.
- University, college or school students taking an electricity or electronics course
- Anyone interested in gaining mastery of the core concepts of electrical and electronic Sciences

For Certification require fulfillment of [illegible]

Course Duration: 30 contacts **Course Commencement: From 1st August 2023**

Course Coordinator: Prof Girish Vekaria **HOD: Dr R H Parmar**

Course Coordinator:- Prof Girish Vekaria HOD:-Dr R.G Parikh

Aims of the programme:

- To develop the skills required to gather information from resources and use them.
- To provide an intellectually stimulating environment to develop skills and enthusiasm of students to the best of their potential.
- To give need based education in physics of the highest quality at the undergraduate level.
- To offer courses to the choice of the students.
- To enable students to perform experiments and interpret the results of observation including an assessment of experimental uncertainties.

Objectives:

By the end of the add on Course on Optical Instruments the students should have attained a common level in basic of Optical Instrument to complement the core for their future courses and developed their experimental and data analysis skills through experiments in laboratories.

Optical Instruments Course Contains

1.1 Introduction to Ray Optics
1.2 Introduction of Light as Ray
1.3 Reflection through Plane surfaces
1.4 Reflection through Curved Surfaces
1.5 Refraction through Plane surfaces
1.6 Refraction through Spherical surfaces
1.7 Lens
1.8 Prism
1.9 Dispersion and its natural occurrence
1.10 Microscopes & Telescopes

Add-on Course on Basic Knowledge of Computer

Registration Fee: Free **Last date: 30 July 2023**

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- [illegible]
- [illegible] computer

Description

"Micro Soft Office" makes desk top work easy!

- [illegible] **Basic Knowledge of Computer Course**, [illegible] easy to understand explanations. **Basic Knowledge of Computer Course**.

[illegible]

1. [illegible]
2. [illegible]
3. Hands On
4. [illegible]

Who this course is for:

- [illegible] of M.Sc.
- [illegible] **Basic Knowledge of Computer Course**.
- [illegible] Computer Science.

For Certification [illegible]

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Aims of the programme:

- To develop the skills required to gather information from resources and use them.
- To provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
- To give need based education in physics of the highest quality at the undergraduate level.
- To offer courses to the choice of the students.
- To enable students to perform experiments and interpret the results of observation, including an assessment of experimental uncertainties.

Objectives:

By the end of the add on Course on Electrical Circuit Analysis the students should have attained a common level in basic of Electrical Circuit physics to complement the core for their future courses and developed their experimental and data analysis skills through experiments at laboratories.

DC Circuit Analysis

Simple RL Circuit – Growth and decay of current (Kirchhoff's equation), RC Circuit, Measurement of high resistance by method of leakage, Comparison of capacities by De Sauty's Method, [illegible] LC Circuit (Series LCR Circuit)

Network Theorem

- Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Theorem

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Add on Course on Optical Illusions

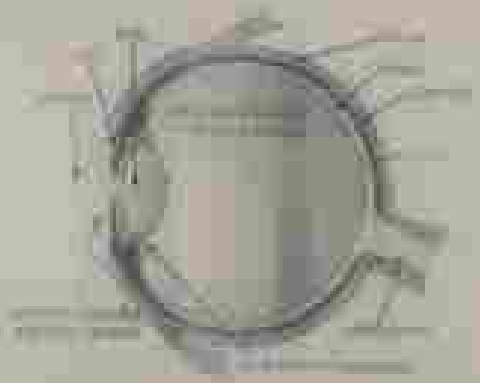
Registration Fee: Free **Last date:** 30 July 2023

Organized by DEPARTMENT OF PHYSICS

Sir P. T. Science College, Modasa

Requirements

- [illegible]
- [illegible]
- [illegible]



Description

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]

Who this course is for:

- [illegible]
- [illegible]
- [illegible]

For Certification course [illegible]

Course Coordinator: [illegible] Course Commencement: From 7th August 2023

Mathematica Fundamentals

a. Mathematica Documentation
b. Numerical Types
c. Introduction to Plots
d. 2D Graphics
e. 3D Graphics
f. Essential Mathematics
g. Solving Equations
h. Polynomial Equations
i. Derivatives
j. Integrals
k. Modular Arithmetic

You'll learn to:

- Get Wolfram Language to compute for you
- Write your first programs in Wolfram Language
- Do computations with real-world data
- Create graphics and visualizations
- Work with state-of-the-art AI methods
- Deploy your programs to the web
- Use modern successful software engineering techniques
- Turn your ideas into computational reality

For Certification require fulfillments evaluation and presence

Course Duration: 30 contacts **Course Commencement: From 1st July 2023**

Course Coordinator: - Dr R H Parmar