Kamla Nehru Mahavidyalaya, Nagpur

QLM 1.3.1

SYLLABUS OF VALUE ADDED/ CERTIFICATE PROGRAM OFFERED

Session 2023-24

Kamla Nehru Mahavidyalaya

Department of Environmental Science

Value Added Course (M.Sc. II)

Green Technology for Sustainable Development

Syllabus

Session: 2023-2024

Theory:

Unit I:Introduction to Green Technology & Environmental Challenges:
Overview of green technology & its role in sustainability , Historical perspectives and key milestones in green technology, Identifying global environmental challenges, The role of technology in addressing environmental issues.

Unit II: Renewable Energy Sources and Energy Efficiency : Solar Energy , Wind energy, hydro energy and geothermal energy technologies. Advantages and limitations of each energy sources. Energy efficient building design and technologies, Sustainable architecture ,Energy conservation practices in industries and households.

Unit III: Green Technology in Sustainable Development : Sustainable Transportation: Electric vehicles and their impacts, Public transportation and smart mobility solutions. Sustainable Agriculture: Precision farming and agro-ecology, vertical farming and aquaponics. Waste Management and Recycling: Waste to energy technologies, circular economy principles.

Unit IV: Green material and Pollution Control Technology: Sustainable material and their application , Eco- friendly manufacturing processes, Water purification and air pollution control technologies. Monitoring and measuring

onmental parameters, emerging technology in the green sector , Ethical and cial considerations in green technology.

Practical:

1) Study of Renewable Energy Sources:

a) Solar b) Wind c) Hydropower d) Biomass and Bioenergy

2) Study of waste to energy processes .(Methane Production)

3) Conducting energy audit for residential and commercial spaces (Identifying energy saving opportunities)

4) Hands on training on installation and maintaining solar panels.

5) Sorting and processing of recyclable material.

6) Designing and installing rainwater harvesting system .

7) Study of water purification techniques.

8) Study of practical application of sustainable construction materials.

9) Study of Setting up home automation for energy efficiency.

10) Case study on successful implementation of green technology.

11)Study of eco-friendly building material.

12) Study of E-waste management and recycling.

KAMLA NEHRU MAHAVIDYALAYA, NAGPUR

Mathematics Department

"Value Added course in Vedic Mathematics"

Academic Session: 2023 – 2024 Duration: 15 days

Teaching Plan

Sr. No	Topic	Hours
1	Addition	2 Hours
2	Subtraction	2 Hours
3	Multiplication	2 Hours
4	Square and Square root	2 Hours
5	Cube and Cube root	2 Hours
6	Magic Calendar	2 Hours
7	Digital root	2 Hours
8	Osculation	2 Hours
9	Quadratic Equation	2 Hours
10	Cubic Equation	2 Hours
11	Biquadratic Equation	2 Hours
12	Division	2 Hours
13	Pythagoras Theorem	2 Hours
14	Apollonius's Theorem	2 Hours
15	Compound multiplications	2 Hours

Dr. Manjusha V. Borkar

Head, Department of Mathematics,

Kamla Nehru Mahavidyalaya, Nagpur

Dr. D.S. Badwaik

Kamla Nehru Mahavidyalaya, Nagpur

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Kamla Nehru Mahavidyalaya

Department of Environmental Science

Value Added Course (M.Sc. I)

Environmental Monitoring & Instrumentation

Syllabus

Session: 2023-2024

Theory:

Unit I:Environmental Monitoring & Parameters : Introduction to Environmental Monitoring , importance of monitoring for sustainability, Regulatory framework and standards . Environmental parameters : Temperature, humidity and pressure measurement, Air Quality Parameters(PM, VOCs, gases), Water Quality Parameters(Physico-chemical, Demand, Nutrients, metal & organic analysis) , Soil Quality parameters (Physico-chemical , nutrients)

Unit II: Sampling Techniques & data analysis: Sampling methodology and strategies , sample collection and preservation . Data interpretation and analysis, Data visualization and statistical analysis, trend analysis and anomaly detection, Reporting and presentation of findings.

Unit III: Environmental Monitoring Instrument : Air Quality Monitoring Instruments (PM sampler and analyzers, Gas analyzer for SOx NOx &CO, Continuous emission monitoring), Water Quality Monitoring Instruments (Water quality sensors and probe ,Instruments for nutrients analysis and metal analysis eg . Colorimeter, UV- Visible spectrophotometer, Turbidity meter, pH meter, AAS),Soil and ground water Quality Instruments (Soil moisture sensor and geophysical method ,Contaminants monitoring in soil and ground water , different instruments for analysis eg. Flame photometer)

nit IV: Noise and vibration measurement: Sound level meter and no ise pollution assessment , decibel scale , intensity and frequency , different instruments use for noise measurements,. Vibration sensors and impact on environment , mitigation strategies . .

Practical:

1) Estimation of oil and grease from industrial water sample.

2) Determination of SPM and RSPM in ambient air by using High Volume Sampler.

3) Determination of SOx concentration in ambient air by using high volume sampler.

4) Determination of NOx concentration in ambient air by using high volume sampler.

5) Measurement of noise pollution by Noise Meter and comparison with standards.

6) Detection of metal ions by paper Chromatography

7) Demonstration of Colorimeter .

8) Demonstration of UV- Visible spectrophotometer

9) Demonstration of pH meter and conductivity meter.

10) Demonstration of Turbidity meter or Nephelometer.

11)Demonstration of Flame photometer.

12) Demonstration of Atomic Absorption Spectrophotometer.

13)Demonstration of Thin Layer chromatography

14) Demonstration of Gas Chromatography.

15) Comparison of environmental Parameters with standards (Air , Water , Wastewater disposal , Noise and Soil)

KAMLA NEHRU MAHAVIDYALAYA, NAGPUR

Mathematics Department

Skill Based Certificate Course in Quantitative Aptitude(2023-24)

Syllabus

Paper I – Arithmetic Ability : (30Hours) (2 Credits)

LCM & HCF, Simplification, Average, Problems of Ages, Percentage, Ratio & Proportion, Time & Work, Time & Distance Problems, Permutation & Combination, Probability,

Paper II – Reasoning and Mental Ability :(15Hours) (1 Credits)

Series Completion A.P. & G.P., Data Interpretation, Direction sense Test, Mirror Image and Water Image, Problems on Pattern,

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Department of Sociology

Skill Oriented Certificate Course

On

Gender Sensitisation

2023-24 Duration: one Month

Teaching Plan

Day	Lecture Topic/sub topics	Hours
1	Introduction to Women's Studies	1 hour
2	Sex and Gender	1 hour
3	socialization, Definition, Nature	1 hour
4	socialization Scope and various dimensions	1 hour
5	Approaches of Feminism	1 hour
6	Feminist ideology, Feminism and Patriarchy	1 hour
7	Feminist Movements in brief	1 hour
8	Basic concepts of Gender and Society	1 hour
9	Sexual division of Labour Masculinity & feminity	1 hour
10	Man and Woman relationship	1 hour
11	Self awareness, consciousness raising consciousness raising	1 hour
12	Women and Law Constitutional	1 hour
13	Laws and Fundamental rights	1 hour
14	Human Rights, Women related Law	1 hour
15	The Dowry Prohibition Act, 1961	1 hour

16	**Protection of Women from Domestic Violence Act, 2005**	1 hour
17	**The Sexual Harassment of Women at Workplace**	1 hour
18	**The Criminal Law**	1 hour
19	Women in Politics – PRI.	1 hour
20	Skill development and presentation	1 hour
21	Film/Documentary Screening	2 hour
22	Field Visits,	3 hour
23	Group discussion and debate plays	3 hour
24	theatre and presentation skills for personality development.	2 hour
	Total	30 hours

Dr.Sucheta Parkar

Associat Professor

Department of Sociology

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Dr.D.S.Badwaik

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DEPARTMENT OF BIOTECHNOLOGY

Session 2023-24

Value-added course on

"Clinical Research"

Syllabus

UNIT I:

Introduction to clinical research

Clinical Research: An Overview, Different types of Clinical Research, Terminologies and definition in Clinical Research, Treatment research, Prevention Research, Diagnostic research, Screening research, Genetic studies and Epidemiological studies.

UNIT II :

Clinical Pharmacology: Pharmacokinetics, absorption, distribution, metabolism, and excretion of drugs, Pharmacodynamics, molecular, biochemical, and physiological effects of drugs, including drug mechanism of action,Pharmacoepidomology, Descriptive and analytical,

UNIT III:

Bioavailability- Absolute bioavailability and Relative bioavailability, time curve and dose response graphs, Bioequivalence, non-replicated or replicated, two-period, two-formulation, two-sequence crossover study.

UNIT IV:

Drug Development Process: Preclinical trail, In Vivo, In Vitro, And Ex Vivo Assays, Human Pharmacology (Phase-I,II,III & IV), Therapeutic treatment discovery, preclinical studies, clinical development and market approval.

Kamla Nehru Mahavidyalaya

Department of Environmental Science

Value Added Course

Syllabus

Session: 2023-2024

Theory:

Unit I:Water Chemistry : definition, Composition, Structure, bonding of water molecule and formula, formation of hydrogen bonding, state of water and anamalous behavior of water , Solubility of gases in water, water as universal solvent.

Unit II: Water Sampling: Necessity of water sampling , Objectives, selection of sampling site, Types of water samples, Collection, Handling and preservation, sampling equipment.

Unit III: Water Quality Parameter: Classification of water quality parameters (Inorganic, Organic and nutrients, Parameters analyzed on the spot (field parameter), Data interpretation, Basic concepts, significance and measurement of DO and BOD.

Unit IV: Water resources: water availability on earth, hydrological cycle, sources of water: Surface water ground water, use of water, Water pollution: sources, effects, Control measures. Standards of drinking water quality (WHO Guideline)

Practical:

1)Water sampling for ground and surface water and its storage techniques.

2) Physical parameters (colour , Temperature ,Turbidity) for characterizing and evaluation of water quality.

3) Relative density test for sample of water.

4) Determination of hydrogen ion concentration (pH) and conductivity of water.

5) Estimation of total solid, total dissolved and total suspended solids by gravimetric method of water and waste water.

6)Estimation of chlorides of water and waste water by Argentometric method.

7) Estimation of alkalinity and acidity of water and waste water.

8)Estimation of total hardness of water and waste water.

9)Estimation of Nitrogen by Kjeldahl methods.

10)Estimation of sulphate and Phosphate in water sample.

11)Estimation of dissolved oxygen (DO) in water sample.

12) Determination of iron and manganese by spectrophotometer.

13)Determination of total coliform of water by MPN technique.

14)Determination of residual chlorine , demand and dose in a provided water sample.

15)Determination of optimum coagulant dose by Jar Test Apparatus.

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Department of Cosmetic Technology
Value Added Course on Skin Care
Session: 2023-24
Bachelor of Cosmetic Technology Semester II

Syllabus:

Theory: **15 hours**

Skin Care:

- Skin
- Structure and of Skin
- Functions of Skin
- Types of Skin
- Analysis of Skin type
- Daily Skin Care
- Specific skin care for different ages
- Skin care for Summer
- Skin care for Winter
- Skin care for Rainy season
- Diet and Exercisefor healthy skin
- Common skin problems
- Skin care products
- Skin care treatments
- Basics of Depilation

Practicals: **15 hours**

- Cleansing
- Toning
- Moisturizing
- Facial
- Waxing

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Department of Cosmetic Technology
Value Added Course on Hand and Feet Care
Session: 2023-24
Bachelor of Cosmetic Technology Semester IV

Syllabus:

Theory: 15 Hours

- Anatomy of Hand
- Anatomy of Feet
- Anatomy of Nail
- Basic Hand and Feet Care
- Hand and Feet Care for Summer
- Hand and Feet for Winter
- Hand and Feet for Rainy season
- DIY Hand and Feet care
- Common Hand and Feet problems
- Footwear and foot health
- Role of massage in Hand and Feet Care
- Hand and Feet massage techniques
- Importance of Exercise in Hand and Feet Care
- Remedies for sore feet
- Nail Care

Practicals :15 Hours

- Manicure — 5 hour
- Pedicure — 5 hour
- Nail art — 5 hour

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Department of Cosmetic Technology
Value Added Course on Professional Make-up Techniques
Session: 2023-24
Bachelor of Cosmetic Technology Semester VI

Syllabus:

Theory: 15 hours

- Introduction to Makeup
- Types of Makeup
- Corrective Makeup
- Makeup Tools and accessories
- Colour Theory
- Brush types and uses
- Makeup products
- Concealing
- Face-Foundation and powdering
- Lips
- Eye makeup
- Bridal makeup
- Airbrush makeup
- Fashion makeup
- Specialized makeup

Practicals: 15 hours

• Bridal makeup	5 hour
• HD/3D Makeup	5 hour
• Airbrush Makeup	5 hour

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Department of Cosmetic Technology
Value Added Course on Personality Development
Session: 2023-24
Bachelor of Cosmetic Technology Semester VIII

Syllabus:

Theory: 15 hours

- Communication Skills
- Stress Management
- Time management
- Listening ability
- Decision Making
- Problem solving
- Goal setting
- Attitude and motivation
- Self awareness
- Empathy
- Body language
- Confidence building
- Interpersonal skills
- Resilience
- Adaptability

Practicals:15 hours

• Public speaking/Group Discussion	5 hour
• Meditation	5 hour
• Body language	5 hour

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Department of Cosmetic Technology
Value Added Course on Entrepreneurship Skill Development
Session: 2023-24
Master of Cosmetic Technology Semester IV

Syllabus:

Theory: 15 hours

- Theories of entrepreneurship,
- Dimensions of entrepreneurship
- Socio-economic environment and entrepreneur.
- emerging trends and social entrepreneurship
- External environmental forces, economic, social, technological and competitive factors, establishment of a new unit.
- Innovation and entrepreneurship,
- Entrepreneurial behavior and social responsibility
- Entrepreneurial development programme relevance and achievements,
- Role of government
- Small business management
- Business communication and ethics in business
- Marketing support for entrepreneurs
- Role of e-commerce in business
- Business opportunities and start-up policy
- Entrepreneurial motivation

Practical:15 hours

- Emerging Trends in Entrepreneurship Development — 5 hour
- Market Survey — 5 hour
- Project Work — 5 hour

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Department of Cosmetic Technology
In Collaboration with Department of Lifelong Learning and Extension, RTM Nagpur University, Nagpur
Organized Certificate Course in Beautification
(Session 2023-24)
Syllabus

Theory Syllabus

T-1. Skin Care – Basic skin care, skin types, daily skin care routine

- Cleansing
- Toning
- Moisturizing
- Theory and causes of Skin Tanning and basic information on sunscreens

T-2. Hair Care – Basic hair structure, types of hairs, hair care routine,

- Hair cleansing and Oiling
- Shampooing and Conditioning
- Hair packs for hair treatments
- Concept of Hair Colouring

T-3. Health Care and Yoga

- Diet and nutrition
- Beauty nutrients
- Exercise and Yoga- facial yogic exercises for anti-aging and anti-wrinkle effect.
- Relaxation
- Personal Hygiene

T-4. Make up

- Preparing face for make up and Advance techniques used for make
- Use of foundation, Recently launched international brands for makeup
- Eye make up
- Lip makeup
- Hairstyle
- Bridal makeup
- Party make up
- Day makeup

Practical Syllabus

P-1. Skin Care Practical

- Skin treatment by using recent techniques

P-2. Make up

- Preparing face for make up and Advance techniques used for make
- Use of foundation, Recently launched international brands for makeup
- Eye make up
- Lip makeup
- Hairstyle
- Bridal makeup
- Party make up
- Day makeup, Office make up

P-3. Health Care and Yoga

- Exercise and Yoga- facial yogic exercises for anti-aging and anti-wrinkle effect.
- Yogasana to improve blood circulation all over body/ facial blood circulation

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Department of Cosmetic Technology
Value Added Course on Effective Writing
Session: 2023-24
Master of Science Cosmetic Technology Semester II

Syllabus:

Theory: 15 hours

- Introduction to Effective Writing
- Principles of Effective Writing
- Types and Stages of Effective Writing
- Notions of Correctness and Appropriateness
- Essay Writing
- Types of Essays
- Essentials of Academic Writing,
- Business Writing and its Functions
- Mechanics of Business Writing
- Business Letters and Memos
- Format of Business Letters and Memos
- Types of Business Letter
- Sales, Complaint and Adjustment Letters
- Report Writing
- Style of Report Writing

Practicals:15 hours

- Essay Writing — 5 hour
- Business Letters Writing — 5 hour
- Report Writing — 5 hour

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Department of Botany

Value Added Certificate Course

'FLOWER ARRANGEMENT'

2023-2024

Syllabus (Under Graduate)

UNIT I: ORIGIN OF FLOWER DESIGN AND IDENTIFCATION OF FLOWER

- Origin of flower designing
- Flower & plant Identification
- Care & handling of Cut flowers

UNIT II: TYPES & CHOICE OF FLOWERS

- Floral bouquets, baskets, wreaths.
- Table Centerpiece
- Ikebana

UNIT III: PRINCIPLES OF FLOWERS ARRANGEMENTS

- Design & balance.
- Arrangement, scale & rhythm.
- Emphasis (Focal point, harmony & unit)

UNIT IV: DIFFERENT STYLES OF FLOWER ARRANGEMENTS

- Oriental flower arrangements
- Traditions/Western flower arrangements
- Modern Flower design.

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Department of Botany

Value Added Certificate Course

'Preservation Techniques for Plants'

2023-2024

Syllabus (Post Graduate)

M.Sc I yr

UNIT I: INTRODUCTION

- Introduction of specimens, targeting collection locations and date with permits.
- Study of types of pressed, dried and wet plant.

UNIT II: ALGAL HERBARIUM

- Herbarium for algae with collection, cleaning, pressing, mounting, storage and conservation with all details.

UNIT III: PTERIDOPHYTE AND FLOWERING PLANT HERBARIUM

- Herbarium for Pteridophytes and Flowering plant with collection, cleaning, pressing, mounting, drying, storage and conservation with all details.

UNIT IV: USES AND MANAGEMENT

- Key to use of Herbarium details.
- Operation and maintenance importance.

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Department of Botany

Value Added Certificate Course

'Miniature Gardens '

2023-2024

Syllabus (Post Graduate)

M.Sc II yr

UNIT I: INTRODUCTION TO MINIATURE GARDEN

- Scope and objectives of gardening
- Style of gardens: Formal, Informal, gardening tools, potting soil, types of propagation
- Principles and making of Terrarium and Kokedama.

UNIT II: TYPES AND IMPORTANCE OF MINIATURE GARNDEN

- Concept of vertical gardens, Small area greening.
- Plants suitable for office space with aesthetic value, break office monotony, air purifier.

UNIT III: LAYOUTS OF MINIATURE GARDEN AND COMPOSTING

- Importance of layout and principles in kitchen and balcony garden.
- Composting and micro greens.

UNIT IV: MINIATURE GARDEN MANAGEMENT

- Gardening management operations: soil laying, manuring, watering.
- Management of pests and diseases with complete cure.

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DEPARTMENT OF MICROBIOLOGY

VALUE ADDED CERTIFICATE COURSE

SYLLABUS OF

"HEALTH AND HYGIENE"

SESSION: 2023-2024

The course is designed to provide a complete guidance on health and hygiene systems. guidelines for implementing and role of government and public in maintaining a healthy life. At the end of the course the student shall be able to understand --

- The importance of health and hygiene in life
- The importance of nutrition for a healthy life
- Different health care programmers of India
- Basic concept of health impact assessment as a means of assessing the policies, plans and projects using quantitative and qualitative techniques
- Importance of community and personal health & hygiene measures
- Importance of food, social tenets, mental condition, physical activity on health

Learning Objectives:

- To provide knowledge on different health indicators and types of hygiene methods
- To impart knowledge on different health care programmes taken up by India
- To create awareness on community health and hygiene
- To enrich knowledge on communicable and non-communicable diseases and their control
- To aware the student on the importance of food, social strategies, mental status and physical activities on health
- To introduce different community-based mobile apps on health to student and thereby to the community

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Learning / Course Outcomes: On completion of this course, the students will be able to understand -

- What is a healthy diet
- How can we use available information to optimize our diet?
- Can nutrition be used for a healthy life?
- Is there a one-size-fits-all "good" diet or should we individualize our dietary goals?
- Disaster management and responsiveness of public in pandemic and epidemicdiseases
- Assess the impact of policies on health and hygiene Health measures to considerwhile travelling
- Awareness in public through digital media viz., mobile apps

Unit I: Basics of Nutrition

1. Nutrition – definition, importance, Good nutrition and mal nutrition; Balanced Diet:Basics of Meal Planning
2. Carbohydrates –functions, dietary sources, effects of deficiency.
3. Lipids –functions, dietary sources, effects of deficiency.
4. Proteins –functions, dietary sources, effects of deficiency.
5. Brief account of Vitamins- functions, food sources, effects of deficiency,
6. Macro and micro minerals –functions, effects of deficiency; food sources of Calcium,Potassium and Sodium; food sources of Iron, Iodine and Zinc
7. Importance of water– functions, sources, requirement and effects of deficiency.

UNIT: II Health Hazards: Health dynamicity

1. Definition, factors influencing health, health as a medium of socio-economic Development.
2. Diseases -- Common food borne and water borne diseases (gastroenteritis, jaundice, Cholera, salmonellosis, travellers' diarrhoea and Escherichia coli infection, typhoid)

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3. Mode of transmission, causative agents, symptoms, prevention and control. Sexually transmitted infections– AIDS, genital herpes, hepatitis B, syphilis, gonorrhoea causative Agents, symptoms, modes of transmission and prevention. Dengue, chikunguniya, rat fever (general methods of mosquito control and the need to prevent mosquito breeding in and around our homes).

4. Lifestyle habits – excessive usage of T.V., computer, mobile phones, two wheelers, and their impacts on health. Lack of physical exercise and its deleterious effects on the body and mind.

Unit III: Hygiene

1. Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (Water, Sanitation and Hygiene) programme
2. Rural Community Health: Village health sanitation & Nutritional committee (Roles & Responsibilities); About Accredited Social Health Activist (ASHA): Village Health Nutrition Day, Rogi Kalyan Samitis
3. Community & Personal Hygiene: Environmental Sanitation and Sanitation in Public places
4. Public Awareness through Digital Media - An Introduction to Mobile Apps of Government of India: NHP, Swasth Bharat, No More Tension, Pradhan Mantri Surakshit Mantritva Abhiyan (PM Suman Yojana), My Hospital (Mera aspataal). India fights Dengue, JSK Helpline, Ayushman Bhava, Arogya Setu, Covid 19AP.

UNIT IV: Adulteration of food:

1. Food hygiene – hygiene of milk, meat, fish, eggs, fruits and vegetables,.

2. Common food adulterants – harmful effects and their detection, food additives, fortification of food;

3. Food Adulteration Act and its stringent implementation.

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DEPARTMENT OF PHYSICS

VALUE ADDED PROGRAM

2023-2024

Name of Program: 1. Basics of Instrumentations

2. Identification & Study of Electronics

When working with such heavy and dangerous equipment, getting accurate measurements can be a very difficult process. This is why instrumentation is so important. Because of the number of processes involved in modern machines, accurate instrumentation is needed to ensure that everything is operating properly. In the present value-added program go through a well-defined syllabus as follows;

1. Basics of Instrumentations

Least counts and measurements using calculation of

a) Vernier Calliper

b) Screw Gauge

c) Travelling Microscope

d) Spectrometer

e) Ammeter

f) Voltmeter, Analog Multimeter and Digital Multimeter

2. Identification and Study of Electronics Components

a) Capacitors

b) Resistors

c) Potentiometer

d) Transistor

e) Diodes

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Syllabus of Value Added Course

on

" Computer Networking"

MCM-II

UNIT 1: INTRODUCTION OF NETWORKING

Network applications, network hardware, network software, Reference models: OSI, TCP/IP, Internet, The public switched telephone Domain name space, DNS in internet,electronic mail, FTP, WWW, HTTP,SNMP, multi-media, network security, Connection oriented network - X.25,frame relay.

UNIT 2: TRANSMISSION MEDIA

Guided transmission media, wireless transmission THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, Sliding window protocols, example data link protocols - ACCESS SUBLAYER: Channel allocations problem, multiple access protocols,Ethernet.

UNIT 3: THE NETWORK LAYER

Network layer design issues, routing algorithms,Congestion control algorithms Internetworking, ,TCP/IP Networking ,Network Security Ensuring Integrity and Availability Network Management Ensuring Integrity and Availability Service.

UNIT 4:

THE TRANSPORT LAYER

Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP. THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web: architectural overview, dynamic web document and Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

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MSc-I

Syllabus of Value Aided Course

On

Data Warehousing

UNIT – I :

Introduction to Data Warehousing: Data Warehouse Architectural Strategies, Data Content, Building a Data Warehouse, Performance Considerations, Crucial Decisions in Designing a Data Warehouse, Different Case Studies.
Various Technological Considerations: OLTP and OLAP Systems, Data Modeling, Managed Query Environment (MQE).

UNIT – II :

(Data Mart and Data Mining Tools) Data Mart: Data Mart, Type of Data Mart, Loading a Data Mart, Metadata for a Data Mart, Data Model for a Data Mart,

Data Mining and Tools:
Introduction, From Data Warehouse to Data Mining, Steps of Data Mining, Data Mining Algorithm, Database Segmentation, Predictive Modeling, Link Analysis, Tools for Data Mining.

UNIT – III :

(SQL Server, Components and Queries) SQL Server Architecture: SQL Server Data Storage Architecture, The Data Engine, System Databases.
SQL Components: SQL"s Basic Object, Data Types, Transact-SQL Functions, Scalar OperatorsQueries, Modification of Table Contents, Stored Procedures and User-Defined Functions, Views.

UNIT – IV :

(Data Integrity, User Security and Concurrency Control) Managing Data Integrity: Data Integrity Controls, Working with Constraints, DML Triggers. Principles and Authentication, Implementing Permission in SQL Server.
Backup and Concurrency Control: Transaction Architecture, Locking, Backup Types, n, Using Transaction Logs, Using Triggers, Replication Methods

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Department of Marathi

सर्टिफिकेट कोर्स -

1) सुलेखन - 16 सप्टेंबर 2023 ते 10 आक्टोबर 2023.

2) सूत्रसंचालन -25 एप्रिल 2022 ते 10 में 2022.

3) सूत्रसंचालन - 14 मार्च 2020 ते 30 मार्च 2020

Kamla Nehru Mahavidyalay
Department of Music
Skill Based Certificate Course
Syllabus
Session - 2023-24

- Some Basic information
- Scales (C,D,E,F,G,A,B)
- Basic chords(major) and (minor)
- Sharp Scale [(C#, D#, (E#), f#,G#, A#, (B#)]
- Advance chords (major and minor)
- Few Songs - Hollywood or Bollywood
- Arpeggios pattern

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KAMLA NEHRU MAHAVIDYALAYA, NAGPUR
DEPARTMENT OF ELECTRONICS

SESSION 2023- 24

Value Added Course
On
Computer Hardware Maintenance

Unit – 1 **4 hrs.**

Basic computer System and Peripherals: Input and Output devices, their types and specification, CPU, Memory devices: Primary and Secondary.
Mother board: Study of Motherboard RAM, ROM, CMOS, POST, BUS (Address, Data System) Motherboard troubleshooting.

Unit – 2 **4 hrs.**

Connections of various devices such as display adapter, ports (Serial, Parallel, and USB) and modem on the mother board. Importance of CPU cooling.
Storage Devices:

a) HDD: HDD types, integrated, SCSI, Magnetic recording, Formatting (Track, Sector) Cluster, Defragmentation, Bad Sector, Jumper Setting, Common Problems and its trouble shooting, External Drive (HDD), Optical Drives.
b) FDD: FDD types and working and its related problems
c) CD and DVD drives: ROM and Writer, combo drives Mass storage devices
d) USB Devices: Hub, Pen Drives

Unit – 3 **4 hrs.**

Input Devices:

a) Keyboard: Switches, keyboard organization, key board type, wireless keyboard trouble shooting.
b) Mouse: Mouse types : Scroll and optical mouse, function connecting mouse, trouble shooting mouse
c) Ports
d) Modems

Output Devices: Printers: working of DMP, Inkjet, Laser Printer, Line Printer, Multifunction Printer and Trouble shooting

Unit – 4 **4 hrs.**

Other Output Devices:

a) Scanner: Working method and its trouble shooting
b) Plotters

Types of Software; System software, application software driver software installation, windows and other software and antivirus

Unit –5 **4 hrs.**

Boot process: setting of CMOS/BIOS setup
Power supply; operating characteristics, types and maintenance
Types of PC Desktop, Laptop, Palmtop,
PC Tools

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Computer Hardware Maintenance (Practical)

Practical Set

i. Study of devices on mother board
ii. Study of keyboard and keyboard decoder
iii. Study of video adapter and display controllers
iv. Study of floppy drives, CD, DVD, Pen Drive and Hard disk
v. Study of Multifunction Input/output controllers

Books:

1. IBM PC Advanced Troubleshooting and Repair: Robert Bernner, PHI
2. Inside the PC: Peter Norton, Techmedia Publication
3. Upgrading and Repairing PCs: Scott Mueller PHI
4. Computer Fundamentals and Introduction to IBM PC: Pankaj Nagar
5. Computer Fundamentals: P. K. Sinha, Priti Sinha, BPB Publications

The total workload for the course is 30 hrs and is divided as follows:

Theory = 20 hrs

Practical = 10 hrs

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KAMLA NEHRU MAHAVIDYALAYA, SAKKARDARA, NAGPUR

DEPARTMENT OF ELECTRONICS

Short term Certification Course on "*Electronics Equipment*"

(Session 2023-24)

SYLLABUS

ELECTRONICS EQUIPMENT

Topic 1: Digital based Equipment

Need of measuring digital based Equipment, their categories of digital Instrumentation devices and their proper uses in digital electronics built Equipment and their accuracy.

Topic 2: Analog based Equipment

Need of measuring analog based Equipment, their categories of digital Instrumentation devices and their proper uses in analog electronics built Equipment and their accuracy.

Topic 3: PLC Automation based Equipment

Basics of Microprocessor and Microcontrollers, basic functions of PLC, advantages over microcontroller, basic architecture, register basics, timer functions, counter function, ladder diagram, overview of PLC systems, I/O modules, power supplies, isolators, programming PLC.

Topic 4: Virtual Instrumentation

Virtual Instrumentation: Historical perspective, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow Comparison with conventional programming. Development of Virtual Instrument using GUI.

Topic 5: Biomedical Instrumentation

Man-instrument basic biomedical system, infrared thermometer (non-contact device), recording system, and patient monitoring system, Biomedical imaging techniques: MRI, ultrasonic, CT SCAN, X-ray tomography, ventilators, Biomedical instruments: Electrocardiography (ECG), hemodialysis machine, cardiac pacemakers, use of telemetry in diagnosis, Lasers in biomedical field.

Topic 6: Communication based Equipment

Fundamentals of antenna, antenna radiation pattern, Frii's transmission formula, field zones, linear, elliptical and circular polarization. The antenna family, short dipole antenna, antenna arrays, broad-side and end-fire arrays, linear arrays, folded dipole, Yagi-Uda array, helical beam antenna, horn antenna, rhombic antenna, parabolic reflectors.

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MCA - I
Syllabus for Value Added Course
On
"Cyber Security"

Module 1:

Defining Cyberspace , Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.

Module 2:

Apply and evaluate the cyber security needs of an organization.

Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.

Module 3:

Evaluate cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools

Design and develop security architecture for an organization.

Module 4:

Design operational and strategic cyber security strategies and policies.

Introduction to Cyber Crime Investigation Firewalls and Packet Filters, Cybercrime and offences, Organizations dealing with Cybercrime and Cyber security in India, Case studies

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Syllabus For Value Added Course

" Certificate Course On IOT"

MCA II

1. Introduction to IOT

- Understanding IoT fundamentals
- IOT Architecture and protocols
- Various Platforms for IoT
- Real time Examples of IoT
- Overview of IoT components and IoT Communication Technologies
- Challenges in IOT

2. Arduino Simulation Environment

- Arduino Uno Architecture
- Setup the IDE, Writing Arduino Software
- Arduino Libraries
- Basics of Embedded C programming for Arduino
- Interfacing Arduino with LCD

3. Sensor & Actuators with Arduino

- Overview of Sensors working
- Analog and Digital Sensors
- Interfacing of Temperature, Humidity, Motion, Light and Gas Sensor with Arduino
- Interfacing of Actuators with Arduino.
- Interfacing of Relay Switch and Servo Motor with Arduino

4. Basic Networking with ESP8266 WiFi module

- Basics of Wireless Networking
- Introduction to ESP8266 Wi-Fi Module
- Various Wi-Fi library
- Web server- introduction, installation, configuration
- Posting sensor(s) data to web server

5. IoT Protocols

- M2M vs. IOT
- Communication Protocols

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DEPARTMENT OF COMMERCE

CERTIFICATE COURSE IN BANKING AND FINANCE

SYLLABUS

Sr. No.	Particulars	Duration
1	Indian Financial System – An Overview Role of RBI, Commercial Banks, NBFCs, PDs, FIs, Cooperative Banks, CRR, SLR; Equity & Debt Market; IRDA Banking Regulation Constitution, Objectives, Functions of RBI; Tools of Monetary Control; Regulatory Restrictions on Lending Retail Banking, Wholesale and International Banking Retail Banking- Products, Opportunities; Wholesale Banking, Products; International Banking, Requirements of Importers & Exporters, Remittance Services; Universal Banking; ADRs; GDRs; Participatory Notes	9 Days
2	Role of Money Markets, Debt Markets & Forex Market Types of Money & Debt Market Instruments including G-Secs ; ADs, FEMA, LIBOR, MIBOR, etc. Role and Functions of Capital Markets, SEBI Overview of Capital Market; Stock Exchange; Commonly used Terms; Types of Capital Issues; Financial Products/ Instruments including ASBA, QIP; SEBI; Registration of Stock Brokers, Sub-brokers, Share Transfer Agents, etc. QIBs.	8 Days
3	Cash Operations Cash Management Services and its Importance Principles of Lending, Working Capital Assessment and Credit Monitoring Cardinal Principles; Non-fund Based Limits; WC; Term Loans; Credit Appraisal Techniques; Sources of WC Funds & its Estimation; Operating Cycle; Projected Net WC; Turnover Method; Cash Budget; Credit Monitoring & Its Management; Base Rate	5 Days

KAMLA NEHRU MAHAVIDYALAYA NAGPUR

4	Capital Budgeting Present Value and Discounting; Discounted Technique for Investment Appraisal; Internal Rate of Return (IRR); Method of Investment Appraisal; NPV and IRR compared; Investment Opportunities with Capital Rationing; Investment Decision making under condition of uncertainty; Expected NPV Rule; Risk Adjusted Discount Rate Approach for NPV Determination; Sensitivity Analysis for NPV Determination; Decision Tree Analysis for NPV Estimation; Payback Methods; ARR.	8 Days

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KAMLA NEHRU MAHAVIDYALAYA

Sakkardara Square, Nagpur

Reaccredited A+ Grade with CGPA 3.53

Certificate Course on
Instrumental Methods of Analysis
Department of Chemistry

Session 2023-24

Teaching Plan for Certificate Course

Time : 12.30 to 1.30 pm

Theoretical Session

Sr. No	Date	Duration	Name of Faculty Member	Topic and Sub-topics (Theory)
1.	Day-1	1.00 Hr	Prof. N. N. Karde	NMR Spectroscopy for Characterization of Nanomaterials
2.	Day-2	1,00 Hr	Prof. Ravin M. Jugade	Ion-Exchange method of analysis
3.	Day-3	1.00 Hr	Prof. W. B. Gurnule	HPLC Method of Analysis
4.	Day-4	1.00 Hr	Dr. Neeta Mohabansi	FTIR spectroscopy
5.	Day-5	1,00 Hr	Dr, Meghna Jumle	TLC Technique
6.	Day-6	1.00 Hr	Dr. S. S. Rahangdale	Electrical Conductance studies by LCR- Q meter
7.	Day-7	1.00 Hr	Ms. Swati Burade	UV-visible spectra
8.	Day-8	1,00 Hr	Dr. R. R. Dubey	Conductometry and Potentiometry
9	Day-9	1.00 Hr	Dr. Pratibha Agarwal	Calorimetric, Principle &

				Applications
10	Day-10	1.00 Hr	Dr. S. Mandavgade	Molecular weight determination of compounds
11	Day-11	1.00 Hr	Ms. Urvi Purohit	Potentiometry and Conductoretry Methods
12	Day-12	1.00 Hr	Dr. S. S. Umare	Conductivity Measuremen t
13	Day-13	1.00 Hr	Ms. Tejaswini Bhalerao	Confirmation of structure by TGA method
14	Day-14	1.00 Hr	Ms. Swati Nagare	Synthesis, Characterization of Copolymer Applications
15	Day-15	1.00 Hr	Dr. M. S. Wagh	Ultrasonic Inter-ferrometer for liquids
			TOTAL	**15 Hrs**

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Certificate Course on

Instrumental Methods of Analysis

Department of Chemistry

Session 2023-24

Teaching Plan for Certificate Course

Time: 1.30 to 3.30 pm

Practical Session

Sr. No	Date	Duration	Name of Faculty Members	Name of Instruments (Practicals)
1.	Day-1	2.00 Hr	Dr. R. R. Dubey	Calibration, Principle & Applications of Potentiometry
2.	Day-2	2.00 Hr	Dr. R. R. Dubey	Calibration, Principle & Applications of Conductometery,
3.	Day-3	2.00 Hr	Dr. M. S. Wagh	Determination of Sound velocity by Ultrasonic Inter-ferrometer for liquids
4.	Day-4	2.00 Hr	Ms. S. S. Nagre	Callibration and Applications of UV-Visible Spectrophotometer
5.	Day-5	2.00 Hr	Ms Swati Burde	Calibration and Applications of Coloured samples by Colorimetry
6.	Day-6	1.00 Hr	Ms. Swati Burde	LCR Bridge Meter, Electrical conductivity and measurements
7.	Day-7	2.00 Hr	Ms.Ankita Dhande	Preparation of samples

				by polymerization technique and Making pallets by using Hydraulic press Machine
8.	Day-8	1.00 Hr	Prof. W. B. Gurnule	Ion meter, determination of pH and ions
9	Day-9	1.00 Hr	Dr. W. B. Gurnule	FTIR Spectrophotometer, Measurements of IR frequency of different **Solid** samples for functional groups and identification of compounds(DRS System)
10	Day-10	1.00 Hr	Dr. W. B. Gurnule	FTIR Spectrophotometer, Measurements of IR frequency of **Liquid** samples
11	Day-11	1.00 Hr	Ms. Swati Burde	LCR Bridge meter, Measurement of electrical conductivity
12	Day-12	1.00 Hr	Ms. Swati Nagare	Analysis of samples by HPLC
13	Day-13	2.00 Hr	Dr. R. R. Dubey	TLC Techniques and Chromatography
14	Day-14	2.00 Hr	Dr. S. P. Puppalwar	PL Meter, Excitation and emission peaks of solid samples
15	Day-15	2.00 Hr	Ms. Swati Nagre	Ion-exchange and Solvent Extraction techniques
			TOTAL	**24 Hrs**

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DEPARTMENT OF MICROBIOLOGY

CERTIFICATE COURSE "COOKERY AND FOOD PRESERVATION"

UNDER JEEVAN SHIKSHAN ABHIYAN, RTM NAGPUR UNIVERSITY

SESSION 2023-24

SYLLABUS

OBJECTIVE:

- To impart students with basic knowledge related to food safety and principle of preservations.
- To introduce students about the concept of processing and preservation of fruits and vegetables.

SYLLABUS

SR.NO.	CONTENT
1.	UNIT I
	PURPOSE AND SCOPE OF PRESERVATION • Types of preservatives • Objectives of preservation and processing • Scope of preservation industry in India **INTRODUCTION OF FOOD MICROBIOLOGY** • Concept Of Microorganism • Types Of Microorganism • Food Contamination And Spoilage • Used Necessity of Microbes in Food Preparations

2.	UNIT II **PRINCIPLES OF FOOD FERMENTATION** • Basic of food fermentation process • Food fermentation products and beneficial microbes **PRINCIPLES OF FOOD MICROBIOLOGICAL ANALYSIS** • Sampling and preparation of microbiological analysis • Qualitative and quantitative microbiological analysis
3.	UNIT III
	PRINCIPLES OF FOOD PRESERVATION BY CONTROLLING MICROBIAL GROWTH • Microbial control by applying sanitation methods and temperature control • Microbial control by drying, irradiation and modified atmosphere • Microbial control by using antimicrobial preservatives and acid; applying non thermal processing and combination of methods (hurdle concept) **FUNDAMENTALS OF FOOD CHEMISTRY** • Carbohydrates, protein, fats • Vitamins and minerals
4.	UNIT IV **POST HARVEST CHANGES AND SPOILAGE & FOOD PROCESSING** • Importance of Microbes in Food • Signs of Contamination and Spoilage In Food • Introduction to Disease Caused by Spoiled Food Contamination of Different Food **FOOD PROCESSING** • Milk and Milk Processing • UHT Milk • Dairy Products-Curd, Yogurt,Bread and role of other ingredients
5.	UNIT V
	FOOD SAFETY • Key terms , factors affecting food safety Recent concern Food laws standards and regulations

	• Food additives and contaminants Hygiene and Sanitation • HACCP

PRACTICALS

- Introduction to basic microbiology, laboratory practices, sterilization, media preparation
- Culturing and sub-culturing of microorganism
- Staining and microscopic examination of bacteria, yeast and molds
- Detection of coliforms by MPN method, confirmed and completed tests
- Detection of effects of various preservatives on the suppression of microbial growth.
- Detection of common dairy pathogen dairy/ (E.Coli/B. Cerus/Salmonella/Listeria) by rapid detection techniques

OUTCOME:

- Upon successful completion of this course student should be able to:

  ¬ Explain the interactions between microorganisms and the food environment, and factors influencing their growth and survival.

  ¬ Explain the significance and activities of microorganisms in food.

  ¬ Describe the characteristics of foodborne, waterborne and spoilage microorganisms, and methods for their isolation, detection and identification.

- Job placements in dairy, quality control and food industries.

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DEPARTMENT OF MICROBIOLOGY

FACULTY OF SCIENCE

VALUE ADDED COURSE (VAC)

ADVANCED TECHIQUES IN CLINICAL MICROBIOLOGY

M.Sc IInd Year

SESSION -2023-24

Learning Objective (LOS)

To Learn the basic and Advanced techniques in clinical laboratory .

UNIT- 1 Laboratory Safety

Organization Of laboratory and safety precaution in laboratory - personal hygiene and care – General health care – Vaccination schedule for technicians –Laboratory and caution – Do'S and Dont's – Lab Accident - cut and wounds - Fire Accident

(Chemical Gas – Flammable Chemicals Electrical ,Spirit Lamp ,Gas)

UNIT 2 - Sample Analysis

Sample Collection ,Processing ,Preservation and transportation Various Clinical Pathology Sample .Pathological Analysis Of Clinical Specimen .

UNIT – 3 Microscopic Analysis

Microscopic Analysis Of Clinical specimens – Urine, Stool, Sputum, Pus, Blood ,CSF and Other Body Fluids.

UNIT -4 Culture Method

Culture Method and Culturing and Isolation of Pathogens From Clinical Specimens .Culture Media - General purpose Media – special media – Selective Media – Differential Media – Transport Media.

- To develop the ability of the students to transform the society through their education.
- To acquaint the students about the methods used in the maintenance of different natural resources.
- Critical Thinking: to include creative thinking, innovation, inquiry and analysis and evaluation.

EXPECTED OUTCOME

As the course include both fundamental and applied aspects of phycology, the students will be benefitted by both and this can direct them towards research in the field of phycology.

Microbiology is one of the most vital fields hence studying microbiology will make the students skilful in understanding the basic concept if role of microorganisms in several industries.

SYLLABUS

THEORY

General characteristics and classification (on the basis of morphology), fine structure of bacterial cell, Gram positive and Gram negative bacteria. Economic importance. Microbial Biotechnology.

General characteristics, types of viruses based on structure and genetic material. Multiplication of viruses (General account) Economic importance.

Habitat, Thallus organization: Cell ultrastructure

General Characteristics, Distribution, Reproduction, Life Cycle, Economic and Ecological importance

Introduction to fungi Salient features; Classification; Thallus organization; Cell wall composition; Nutrition; Classification. Mycorrhiza (Ectomycorrhiza, Endomycorrhiza and their significance); Lichen: & Economic Importance.

PRACTICAL

Safety measures and Good Laboratory Practices in microbiology laboratory.

Introduction, operation, precautions and use of common microbiology laboratory instruments: Incubator, Hot air oven, Autoclave, Colorimeter, Laminar air flow hood, Clinical centrifuge. 2 2 i. Construction (mechanical and optical), working and care of bright field microscope.

Basic staining techniques: i. Monochrome staining ii. Gram staining of bacteria .

Microscopic observation of Algae and Fungi.

Observation of motility in bacteria using: Hanging drop method.

Algal Biomass Production .

SCP Production

Bakers Yeast Production

Kamla Nehru Mahavidyalaya, Nagpur
Department of Biochemistry
Value Added Course
Hands on training in Empirical Biochemistry
Session-2023-2024

The objective of the course "Hands on training in Empirical Biochemistry" for explaining the essentials of Biochemistry related technology to develop enthusiasm amongst students. This course intends to provide fundamental understanding and practical handling as well as research application associated with the techniques.

Learning outcome

Through this course students are exposed to biological molecules. They will acquire knowledge about qualitative and quantitative estimation of biomolecules. This skill based course introduces the students to the concepts in biophysical, biochemical and molecular techniques. Through this course students will be acquainted with the principles, applications and instrumentation used in biochemistry.

Course Content

Section I

Basic equipment used in biochemistry.

Handling of pH meter, Colorimeter, Spectrophotometer, Weighing balance, Centrifuge, incubator oven, heating bath, Water bath, distillation assembly, autoclave, micropipettes etc.

Section II

Basic Biochemical tests

Basic biochemical tests for qualitative and quantitative estimation for Protein, Lipid, Nucleic acid and carbohydrate.

Section II

Separation techniques.

Separation of Biomolecules by using different types of separation techniques including Chromatography, Electrophoresis.

Section III

Molecular Biology Techniques

Isolation of DNA from bacteria/blood sample.
Agarose gel electrophoresis of DNA.
Visualization of DNA by UV transilluminator
Demonstration of Polymerase Chain Reaction technique.

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Principal
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'Maintenance and Repairing of Domestic Appliances'

Total -30 Hours (2 Credits)

Paper - I

Basic Electrical Engineering and Safety Precautions

Total periods: 08

Max Marks: 30

Major Topics

Sr. No.	Topic	No. Of Periods Alloted
1.	Basic Electrical Engineering	06
2.	Safety Precautions: First Aid	02
	Total	08

Syllabus content:

Basic Electrical Engineering

1.1 OHM's Law: Electric current - conductors - insulators Semi-conductors-Electric potential-Resistance-Ohm's Law - Resistances in series and parallel simple problem.

1.2 Work-power-Energy: Definitions of work, power & energy simple problems on power & energy, DC, A.C. power

1.3 Cells: primary cells - secondary cells - lead acid cell construction and working - efficiencies of cells defects in cells - charging methods - maintenance.

Safety Precautions: First Aid

Precaution to be taken at various stages, while handling tools during wiring- electric fire-precautions against shocks-first aid artificial respiration.

Lab - I

Electrical Lab

Practical No. 01

Total Periods 07

Max Marks: 20

1. Measurement of power of a Appliance / Circuit
2. Testing and charging of cells
3. To Verify Ohm's Law
4. Connecting, starting of running and reversing of a I-Q capacitor motor.

aper - II

Domestic Appliances

Total periods: 08 Max Marks: 30

Major Topics

Sr. No.	Topic	No. Of Periods Allotted
1.	Heating Appliances	04
2.	Motorise and Other Appliances	04
	Total	08

Syllabus content:

Heating Appliances:

Electric Iron - Electric Stove - Immersion coater Heater Geyser –Table lamp - Testing & Repairing. A.C. Motor Winding

Motorised Appliances:

Electric Fans (Ceiling Fan, Table Fan, Pedastal Fan etc.) Electric Mixer - coat Grainders - Coashing Machine - vacuum cleaner – Electric Hand drill - Domestic water pump sets : Installation, Testing, Servicing and Repairing of above Mentioned Appliances.

Other Appliances:

Installation, Testing, Servicing and Repairing of Emergency Light –Invertors.

Lab - II

Domestic Appliances Lab

Practical No. 02

Total Periods 07 Max Marks: 20

1. Testing of various Domestic Appliances mentioned in the Theory Subject - II
2. Dismantling of various Domestic Appliances mentioned

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DEPARTMENT OF PHYSICS

VALUE ADDED PROGRAM

2023-2024

Name of Program: Designing Regulated and un-regulated Power Supply

SYLLABUS

In the world of electronics, power supply plays an essential role. It provides the necessary power for electronic devices to function correctly. The power supply can either be regulated or unregulated. Both regulated and unregulated power supply have their advantages and disadvantages, and it's essential to understand the difference between them to make an informed decision on which type of power supply to use. In the present value-added program go through a well-defined syllabus as follows

1. Introduction of the resistor, capacitor, Diodes, Transistor, Integrated circuits (ICs) Transformer, printed circuit board

2. Unregulated Power Supply-Regulated Power Supply, Steady and Pulsating DC Voltages Rectifiers Half-wave Rectifier, Full-wave Rectifier-Full-wave Bridge Rectifier, Filters, Series Inductor Filter Shunt Capacitor Filter Effect of Increasing Filter Capacitance-LC Filter, The CLC or Pi Filter-Bleeder Resistor-Voltage Regulation-Zener Diode Shunt Regulator, Transistor Series Voltage Regulator Controlled Transistor Series Regulator, Transistor Shunt Voltage Regulator, Transistor Current Regulator, Voltage Dividers Complete Power Supply Voltage Multipliers Half-wave Voltage Doubler, Full- wave Voltage Doubler-Voltage Tripler and Quadrupler

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DEPARTMENT OF BIOTECHNOLOGY

Session 2023-24

Syllabus

Unit I: Major sector

Academic
Agriculture
Pharma and health sector
Pollution control Board
Genetic Engineering
Industrial Sector (At production level)

Unit II: Opportunities in industries

Industries working experience in the area of microbial, plant, health care, Basic experience, skills.
knowledge required for the industries, Small, Big and multinational industries.
Small Scale Industrial units, advantage and
support by Govt. for SSI,
Opportunities in services provided by the industry research, Opportunities in reagents preparation, packaging and distribution. R&D in industries.
Major industrial groups in India.
International industrial organization.

Unit III: Opportunities in research

General Organizational structures of Research Institute,
Qualifications for researcher positions.
JRF, SRF, RA, PDF.
Scientist positions in Government and private research institutes.
Research outcome - Publication, Patent and technology transfer.
Training man power, Conduct of Seminar, Symposia and Workshop.
Advantages, Challenges and Risks of employment in research institute.

Unit IV: Funding agencies

Types of funding,
Government funding institutes like DBT, ICMR, CSIR, aCSIR, and UGC
Preparations of Project proposals.
Importance of research publications.
Preparation of projects and Basic requirement for funding.
Funding from Agricultural institutes, Private funding, Research grants, Collaborative research.
International funding for higher studies and Research.
International collaborations and sharing of resources across the country.