

FATIMA MATA NATIONAL COLLEGE

AUTONOMOUS

(Reaccredited with 'A' Grade by NAAC)

Affiliated to University of Kerala



1.3.2 Add-on Course Syllabus

IQAC INTERNAL QUALITY ASSURANCE CELL

**FATIMA MATA NATIONAL COLLEGE
(AUTONOMOUS), KOLLAM**

Syllabus and Textbooks

Add on Course

Name of the course : 'Communicative Hindi'

Prescribed Textbook
Bolchal Ki Hindi aur Sanchar

By Dr. Madhu Dhavan

Vani Prakashan

Module I Bolchal Ki Hindi

Conversations in Home, Picnic place, Rail Journey, Bank, Hospital, Police Station and in a phone call should be studied.

Application letter for Employment should be studied.

Module 2 Technical Terminology

Text - Bolchal ki Hindi aur Sanchar

Module 3 Grammar

Text Book - Vyavaharik Hindi Vyakaran

By Dr. H. Parameswaran

Radhakrishna Prakashan, Delhi

Kal (Tense) only

Books for General Reading

1. Bolchal ki Hindi - Dr. Suseela Gupt
Lokbharathi Prakashan
2. Hindi Patrakaritha - Mahendra Kumar Mishra
Rashtreeya Hindi Sahitya Parishad
3. Subodh hindi Vyakaran - Dr. Meenakshi Agarval
Rajkamal Prakashan

DEPARTMENT OF COMMERCE.

Add on course in Applied Business Accounting.

The add on programme runs through six semesters of the undergraduate programme, one paper in each year covering two semesters (S1&S2, S3&S4 and S5&S6). The following are the papers to be covered in each year.

1. Essentials of Applied Book-keeping.
2. Basic Accounting Applications
3. IT Based Applied Accounting.

After having been successfully completed the paper Essentials of Applied Book-keeping during the first year of the U G programme the candidate is considered completed certificate programme. The successive and successful completion of the paper, Applied Accounting and AS, the candidate will be awarded a diploma. Similarly, on completion of all the three papers in the third year, the candidate will be awarded advanced diploma.

Course objectives/outcomes

The overall objective of the programme is to enable the students to handle independently the accounting vocation in industries under different organisational set up. It also facilitates them in continuing advanced studies in professional accounting. The following are specific objectives:

1. To equip the students with strong practical fundamentals in applied book keeping.
2. To enable the students on applied aspects of preparation of general purpose financial statements and to elicit information there from.
3. To familiarise the students about Indian Accounting Standards in professional accounting practices.
4. To make the students capable of preparing and generating electronic form of accounting information.
5. To enable the students to explore advanced level applied aspects of accounting and to pursue themselves for professional accounting programmes.

Paper I: COA 101 - Essentials of Applied Book-keeping.

No. of instructional hours: 30

Aim of the paper: To equip the students with the preparation of accounts of various business areas and to acquire strong practical fundamentals in applied book keeping.

Course Objectives

1. To create conceptual and practical awareness on accounting cycle.
2. To enable the students to understand the underpinnings bill transactions.

Module 1: Review of accounting cycle-I : Financial information – Concepts and conventions – Journal – Ledger – Subsidiary books.

(10 Hrs)

Module 2: Review of accounting cycle-II : Errors and rectification – Bank reconciliation statement – Bill Transactions - Trial balance.

(10 Hrs)

Module 3: Financial Statements : Final accounts with advanced adjustments – Balance sheet – Significance and implications.

(10 Hrs)

Structure for preparing question paper: Theory 20% , Problem 60% and Practical 20%

Books Recommended:

1. Gupta R.L. and Radhaswamy. M. *Advanced Accountancy*, Sultan Chand & Sons, New Delhi.
2. Shukla M.C., Grewal T.S and Gupta S.C. *Advanced Accounts*, S. Chand & Co. Ltd., New Delhi.
3. Jain S.P. and Narang. K.L. *Advanced Accountancy*, Kalyani Publishers, New Delhi.
4. Naseem Ahmed, Nawab Ali Khan and Gupta M.L. *Fundamentals of Financial Accounting Theory and Practice*, Ane Books Pvt. Ltd., New Delhi.
5. Maheswari S.N. and Maheswari S.K. *Advanced Accountancy*, Vikas Publishing House, New Delhi.
6. Mukkerji & Haneef. *Advanced Accountancy*, TMH, New Delhi.

Paper II: COA 201 - Basic Accounting Applications

No. of instructional hours: 30

Module I: Cash flow analysis - Cash Flow statement– meaning- objectives and uses-differences between Cash Flow Statement and Fund Flow Statement- Preparation of Cash Flow Statement.

(6 hrs)

Module II: Fund flow analysis - Fund flow statement- Meaning - objectives-uses of Fund Flow statement- differences between Fund Flow Statement and Balance sheet- differences between Fund Flow Statement and Income statement- Preparation of Fund Flow Statement.

(6 hrs)

Module III: Ratio Analysis – Meaning – Importance – Temporal analysis and cross sectional analysis – Liquidity ratios – Solvency ratios – Profitability ratios – Leverage ratios – Coverage ratios – Interrelationships between ratios – Preparation of Final statements using ratios (simple problems)

(18 hrs)

Books Recommended:

1. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*, Tata McGraw Hill Co. New Delhi
2. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
3. Man Mohan, Goyal S.N. *Principles of Management Accounting*, SahityaBhawan Publications, Agra.
4. ShashiK. Gupta and Sharma R.K. *Management Accounting*, Kalyani Publishers, New Delhi.
5. Gupta S.P and Sharma R.K. *Management Accounting*, SahityaBhawan Publications, Agra.
6. Kulshustia and Ramanathan. *Management Accounting*, Sultan Chand & Sons, New Delhi.
7. Maheswari S.N. *Management Accounting and Financial Control*, Sultan Chand & Sons Delhi.
8. Pandey I.M *Principles of Management Accounting*, Vikas Publishing House, New Delhi.
9. Khan M.Y & Jain P.K. *Management Accounting*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
10. Revi M. Kishore. *Management Accounting*, Taxman Publications Pvt.Ltd., New Delhi.

Paper III: COA 301 - IT Based Applied Accounting.

No. of instructional hours: 30

Aim of the course: To update and expand the skills in the application of accounting packages.

Course objectives:

1. To expose the students to computer application in the field of Accounting.
2. To develop practical skills in the application of Accounting Package.

Module I: Company creation and set-up of accounts in Tally (8.1 or higher version), Creation of a Company, Alteration, deleting, and shut a Company - concepts of Grouping of Accounts – Predefined account groups, display or alter groups. Creating Ledger Accounts – Predefined ledger accounts, creation, display, alter and deleting ledger accounts - Inventory – items, groups, units, creating a single stock group, creating a multiple stock group, stock items.

(10Hrs)

Module II: Accounting vouchers: - Vouchers, Types of Vouchers , Creation of Voucher type, Types of accounting Vouchers , Cost centre and cost category, interest calculation, Reversing journals and optional voucher, Memorandum Voucher - Inventory vouchers – stock journal, Stock category, bill-wise details, multiple Godowns, - Working with payroll info menu- payroll configuration - pay roll vouchers- payroll reports

(10 Hrs)

Module III: Report Generation and Printing - Display of Trial balance, profit and loss accounts, balance sheets, consolidated statements companies/branches. printing reports.

(10 Hrs)

Recommended Practicals: Application of Tally - creation of companies; creation of primary groups, secondary groups; creation of ledgers; creation of inventory – items, groups, units etc.; Creation of different types of vouchers; bills wise details; interest calculation, creation of godowns; Preparing, display and alter books of accounts, preparing stock reports, stock query, branch accounts, invoices, and price list and bank reconciliation statement.; Creating payroll vouchers , Generating fund flow statements, ratio analysis statements, budgets; preparation of TDS return. ; Generating Trial balance, Profit and Loss Accounts, Balance Sheets,

Books Recommended:

1. Institute of Computer Accountants .*Tally*, Vikas Publishing House, New Delhi.
2. Tally Academy .*Tally Manual*.
3. TALLY 9 Upto release 3.0, Computech Publications Ltd., New Delhi.

FATIMA MATA NATIONAL COLLEGE (AUTONOMOUS), KOLLAM
DEPARTMENT OF ECONOMICS
ADD ON COURSE
(Skill Enhancement Course)

DATA ANALYSIS

Course Description:

This course introduces the student to collection and presentation of data. It also discusses how data can be summarized and analyzed for drawing statistical inferences. The students will be introduced to important data sources that are available and will also be trained in Excel Software to Analyse data.

Course Outline:

1. Sources of data. Population census versus Sample surveys. Random sampling.
2. Univariate frequency distributions. Measures of central tendency: mean, median and mode; arithmetic, geometric and harmonic mean. Measures of dispersion, skewness and kurtosis.
3. Bivariate frequency distribution. Correlation and regression. Rank correlation.
4. Estimation of population parameters from sample data. Unbiased estimators for population mean and variance.
5. Basics of index numbers: price and quantity index numbers.
6. Introduction to data analysis – Excel tables- Basic pivot tables-Dashboards- Profitability Analysis-Comparing year over year in pivot tables- Reporting Hierarchical data- multi table pivot tables.
7. Describe data using charts and basic statistical measures, defining Data, Histograms and Skewness, Descriptive Statistics with Analysis Tool Pack, Boxplots, Categorical Data, Pivot Tables, and Pivot Charts, Summarizing Hierarchical Data-using Excel

Readings:

- 1 Tamhane, Ajit C., and Dorothy D. Dunlop. Statistics and Data Analysis: From Elementary to Intermediate. Prentice Hall, 1999.

2. M.R. Spiegel (2003), *Theory and Problems of Probability and Statistics* (Schaum Series).

Add on Course

Proficiency in English and Soft Skills

Duration : 30 Hours

Course Objective

Today's world is all about relationship, communication and presenting oneself and one's ideas in the most positive and effective way. Language is the most commonly used medium of self-expression in all spheres of human life-- personal, social and professional. A student must have a fair knowledge of English language and the skills to communicate effectively in order to handle various jobs in future. The objective of this course is to enable the students to acquire proficiency, both in spoken and written language.

Course Outcome

At the end of the course, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills and enhance skills in spoken English. In addition the student can cultivate basic interpersonal communicative skills and soft skills. Eventually the student can achieve excellence in both personal and professional life.

Module I

Grammar and Vocabulary

Introduction to parts of Speech –articles –comparative adjectives – the difference between countable and uncountable nouns – application of tenses –imperatives – different question types .Building up English words of daily usage with correct pronunciation.

Module II

Principles of Communication

LSRW (Listening, Speaking, Reading and Writing) in communication. Definition— Significance—development of the Skills--Introduction to English Sounds / Rhythm.

Letter Writing: formal and informal-- Paragraph writing--, Writing Memos, Circulars, Notices, Reports, etc.

Listening: comprehension/ accent/ pronunciation.

Reading -Intensive and extensive.

Module III

Soft Skills

Introduction to soft skills – Developing positive attitude- Improving perceptions – Forming values – Interpersonal skills/understanding others – Team building – group dynamics – Net working – Improved work relationship – Developing body language – Practicing etiquette and mannerism – Stress management – Goal setting – Career planning.

Module IV

Practical Session

Listening to pre-recorded English Language Learning programmes

Paper reading before an audience (reading unseen passages)

Study of essentials of a good speech—to respond and comprehend visual themes, situations or stimulus and practice before select gathering.

Greetings for different occasions

Introducing oneself, others and leave taking.

Encouraging students to write blogs, tweet, text and email employing appropriate language

Group Discussion/ Interview/ Role play/ Debate

ADD ON COURSE
CERTIFICATE IN COUNSELLING

Enable the participants to gain firsthand knowledge about the basic counselling skills and techniques, and also empower them with the holistic aspects of counselling. Fine tuning of the skills is made possible through the practicum sessions and through the mandatory clinical hours required. Case reporting will also add to the experiential element. The focus and attention to the practicum sessions as well as the report submission requirements will increase the employability of the students of this course, and also provide them with a greater advantage over their peers in other institutions.

Module – I: Introduction

(4 hrs.)

Meaning – Definition - Goal, Scope, Qualities of an effective counsellor, Types and approaches to counselling (A brief overview) - Ethical and legal issues in counselling

Module – II: Counselling Relationship

(3 hrs.)

Nature of relationship – Physical setting – Privacy – Contracting – Setting boundaries & expectations – Empathy – Rapport building – Transference and Counter transference – Resistance.

Module – III: Counselling Skills

(3 hrs.)

Attitudinal skills: Respect, Unconditional Positive Regard, Empathy, Self – disclosure, Confrontation – Listening skills – Communication skills: Verbal and non-verbal – Leads: Restatement of contents, Asking Questions, Reflection of feelings, Reassurance, Interpretation and Feedback.

Module – IV: Steps and Processes in Counselling

(10 hrs.)

Client self-exploration – First interview – Initial Counselling session – Diagnosis – Deeper exploration and Analysis – Implementation – Follow up – Termination of Counselling relationship.

Practicum

A minimum of 10 Practical hours are considered mandatory for the completion of the course, supplemented by the submission of at least 4 counselling case summaries from different areas.

Reference

- Rao, N. & Shajpal, P. (2013). Counselling and guidance, New Delhi: McGraw Hill Education(India) Pvt. Ltd
- Nelson-Jones, R. (2002). Basic Counselling Skills. London: Sage.
- Seligman, L. W., & Reichenberg, L. W. (2013). Theories of Counselling and psychotherapy (4th ed.). New Delhi: Pearson.
- Gibson, R. L., & Mitchell, M. (2008). Introduction to Counselling and guidance. Upper Saddle River, NJ: Pearson/Merrill/Prentice Hall.
- Gladding, S. T. (2018). Counselling: A comprehensive profession.
- Singh, K. (2015). Counselling skills for managers. New Delhi: Prentice Hall India.

FATIMA MATA NATIONAL COLLEGE (AUTONOMOUS), KOLLAM.

ADD- ON COURSE OFFERED BY THE DEPARTMENT OF ZOOLOGY

AQUARIUM CONSTRUCTION AND MAINTENANCE

AIM OF THE COURSE:

To equip the student to construct an aquarium and also to master the technique of maintenance such that it enhances his chances of self-employability in the field of ornamental fish farming and trading.

OBJECTIVES OF THE COURSE

- To learn the scientific method of setting an aquarium
- To learn the culture of live feed and formulated feed of fish
- To identify the common diseases of ornamental aquarium fishes and their effective treatment.

SYLLABUS

DURATION: 30 HRS

MODULE I

(5 Hrs)

Importance and history of aquarium fish keeping. Design and construction of aquaria: aquarium fabrication- shape, size, volume, type of glass tank, cutting of glass, preparation of glass tank, strengthening and supporting of tank, fitting of tanks into room settings; aquarium floor setting- type and size of pebbles, gravels, granites used for bed setting and its advantages. Filters- biological, chemical and mechanical. Aquarium accessories like aerators, decorative, lighting, heating and feeding trays.

MODULE II

(3 hrs)

Water quality management in aquarium systems- sources of water, containers, storage, temperature, pH, dissolved CO₂, ammonia, hardness, turbidity and ozone in aquarium.

MODULE III**(4 Hrs)**

Aquarium plants: uses of aquarium plants, different varieties of plants like submerged plants (tubers, rooted plants, cutting plants) and emerged plants, indoor and outdoor plants, selection of plants, planting techniques, propagation and maintenance of aquarium plants. Advantages of natural plants over artificial plants.

MODULE IV**(8 hrs)**

Aquarium maintenance-setting up of a freshwater community tank and its maintenance. Food and feeding- live feed and formulated feed. Preparation and culture of live feed (Artemia, Infusoria, Spirulina). Control of algal growth, snails and other predators. Common diseases of ornamental aquarium fishes-their causative agents-virus, bacteria, fungi, protozoa and nematode; symptoms, treatment and prophylactic measures

MODULE V**(10 hrs)**

Hands-on training and practical session

Course Co-ordinator : Mrs. Nisha Thomas Panikkaveetil

ADD ON COURSE ON
“MUSHROOM CULTIVATION”

From

Post Graduate and Research Department of Botany

Fatima Mata National College

Kollam-1

Course Coordinator: Dr. B. Sinilal, Assistant Professor



COURSE CURRICULUM & SYLLABUS

With the motto of 'Earn while Learn', Post Graduate and Research Department of Botany, Fatima Mata National College, Kollam, is proposing an add-on course on 'Mushroom Cultivation'. The course will offer the basic concepts of mushroom growth, along with the hands on experience in cultivation of selected edible mushrooms. The course is designed in such way for attaining the major goals listed below:

1. Get an appreciation on the importance of embarking on self-employment and developing the confidence and personal skills for the same.
2. Identification of business opportunities in chosen sector / sub-sector and making a plan for marketing the products / services
3. Starting a small business enterprise by liaoning with different stake holders
4. Managing a small scale business enterprise
5. To equip for taking up Mushroom Cultivation as a profession and run it profitably
6. Selection of important types of Mushroom and their cultivation
7. Maintain Mushroom farm in a hygienic and scientific way
8. Work out the economics of Mushroom Cultivation
9. Take up value added products of Mushroom i.e. preparation of Mushroom Pickle, Powder, Papad and different items of Food

Distribution of Teaching Hours

Class room teaching	10 Hrs
Lab training	20 Hrs
Total Teaching Hours	30 Hrs

COURSE SYLLABUS

Unit: I Economic Importance of Fungi: Types based on usage-Edible, Poisonous, Pathogenic, Saprophytic, Industrial usage; Key to differentiate Edible from Poisonous mushrooms.

Unit: II Mushroom morphology: Different parts of a typical mushroom, general structure of fungal hyphae, morphology of fruiting bodies; Types of fungi- Epigenous & Hypogenous, Natural Habitats-Humicolous, Lignicolous & Coprophilous.

Unit: III Biology of Mushrooms: Button, Straw & Oyster- General morphology, distinguishing characteristics, spore germination and life cycle.

Unit: IV Health benefits of Mushroom: Nutritional value- Protein, aminoacids, carbohydrates , fats, vitamins & minerals and calorific value. Antiviral, antibacterial, antifungal and anti-tumour effects, haematological value cardiovascular & renal effects, in therapeutic diets, adolescence, for aged persons & diabetes mellitus.

Unit: V Cultivation System & Farm design: Fundamentals of cultivation system-small village unit & larger commercial unit. Principles of mushroom farm layout-location of building plot, design of farm, bulk chamber, composting platform, equipments & facilities , pasteurization room & growing rooms.

Unit: VI Compost & Composting: Principles of composting, machinery required for compost making, materials for compost preparation. Methods of Composting- Long method of composting (LMC) & Short method of composting (SMC).

Unit: VII Spawn & Spawning: Facilities required for spawn preparation, Preparation of spawn substrate, preparation of pure culture, media used in raising pure culture, culture maintenance, storage of spawn.

Unit: VIII Casing materials & Case running: Importance of casing mixture, Quality parameters of casing soil, different types of casing mixtures, commonly used materials.

Unit: IX Cultivation of Button, Oyster and Straw Mushrooms: Collection of raw materials, compost & composting, spawn & spawning, casing & case run, cropping & crop management, picking & packing. Visit to relevant Lab/Field.

BUDGET

Sl. No.	Item	Expenditure incurred (Rs.)
1	Remuneration for Resurce person (30 Hrs x Rs.500/-)	15,000.00
2	Laboratory facilities	25,000.00
3	Mushroom spawn	10,000.00
4	Organisational expenses	5,000.00
	Grand Total	55,000.00

FMNC

PHYSICS DEPARTMENT
ADD-ON COURSE–RADIATION PHYSICS
SYLLABUS

Radiation (5 hours)

Definition, Types of radiation, Ionizing and non-ionizing radiation, Radiation Protection :Instruments for personnel monitoring, Contamination monitors for alpha, beta and gamma radiation. radiation exposure criteria.

Awareness about Mobile phone radiation(5 hours)

Radiation rate, biological effect of mobile phone radiation include cancer, electromagnetic hypersensitivity, tumor ,hereditary disorders, Autism etc.

Radiation Quantities and Units: (5 hours)

Radiation quantities and units -Absorbed dose- Radiation and tissue weighting factors, equivalent dose, effective dose, committed equivalent dose, committed effected dose – Concepts of collective dose ,Specific absorption rate.

Biological Effects of Radiation: (5 hours)

Somatic effects of radiation – Dependence on dose, dose rate, type and energy of radiation - Acute radiation sickness – Effects of chronic exposure to radiation – Radiation Carcinogenesis – – Genetic effects of radiation – Factors affecting frequency of radiation induced mutations – Dose-effects relationship – first generation effects – Effects due to mutation of recessive characteristics – Spontaneous mutation rate .

Practical (10 hours)

1. Estimate the radiation rate from mobile phones using radiation leakage detectors.
2. Comparison of specific absorption rate of different SIMs using same mobile phones.
3. Estimate the power densities of radiation for different instant of a long duration call.
4. Estimate the effective dose of gamma radiation.
5. Calculation of absorption rate of radiation of Wi-Fi from different rotors.

Radiation Physics –Add-on Course

Objectives

- Introduce the fundamentals in radiation physics.
- Introduce the radiation dose rate and the international limit of radiation.
- This course introduce the protective techniques about radiation.
- Outline the biological effects of both ionizing and non-ionizing radiation.
- Give awareness to young generation about the silent killer –the mobile phone radiation, and thereby save the incoming generation from hereditary disorders like autism, and other birth problems.

Outcomes

- Students will aware about the radiation dosimetry and international limit for ionizing and non-ionizing radiation.
- Students will understand the biological effects of radiation.
- Students will aware about the radiation protective measurements.
- Most significantly this course contain the biological effects of mobile phone radiation and its dosimetry.
- The knowledge about mobile phone radiation will save our young generation from the deep addiction of mobile phone.

CAREER OPTIONS FOR RADIATION PHYSICS

Given below is the tabulated details of the degree/diploma and the career options available in Radiation Physics.

S.No	Degree/Diploma	Essential Qualification	Career option
1	M.Sc.(Radiation Physics)	B.Sc.(Life Sciences /Physics/chemistry/mathematics)	Research, option for higher studies in radiation physics, Medical Physicist in Hospitals and Oncology Departments
2	M.Sc. (Medical Physics)	B.Sc.(Life Sciences /Physics/chemistry/mathematics)	Research, option for higher studies in radiation physics or medical physics, Medical Physicist in Hospitals and Oncology Departments
3	Dip.In Radiological Physics(Dip.R.P)	M.Sc. (Physics)	Radiation safety officer, in Hospitals as medical physicist, Oncology Dept. as Medical physicist.
4	Diploma in medical radioisotope techniques (DMRIT)	B.Sc. (Chemistry/Physics/ Life Sciences/ Biotech./ Biochemistry/ Microbiology/Biophysics), B.Sc. (Nuclear Medicine Technology) or B.Sc. (Medical Radiological Technology)	Nuclear Medicine centers, Cancer hospitals and radiological centers as Medical Physicist

Medical Physicist:

- The treatment of patients with radiation involves planning, dosimetry, quality assurance checks to be done meticulously in which the medical physicists play an important role.
- A lot of private hospitals are coming up with modern radiation therapy facilities in India and there is a definite demand for medical physicists. So the most shot of job for the medical Physicist is in the cancer hospitals.
- They can work alongside clinicians in providing scientific and technical expertise and conducting research.
- They are also qualified to serve as Radiological Safety Officers(RSO) in research and industrial institutions handling radioisotopes and ionizing radiations.

Radiation Physicist:

- The professionals with degree/diploma/training on radiation Physics can work as Radiological Safety Officers(RSO) in research and industrial institutions where ionizing radiations are used.
- Another area where radiation Physicist plays an important role is in increasing the shelf life of perishable agricultural products during large-scale packaging for export, the professionals are in demand in this sector too.
- Gamma irradiator is used in food irradiation plants to package the products. Along with this, Gamma irradiation can be used for irradiating seeds in order to make them fungal proof or disease resistance. So the radiation Physicist can have important role in all such places.

Educational Opportunities

Details of the Universities with courses offered, duration and minimum Qualifications are listed below:

S.No	University/Institution	Degree/Diploma	Duration	Minimum Qualification
1	Department of Physics, Anna University, Chennai http://www.annauniv.edu/	M.Sc Medical Physics	2 Years	B.Sc. (Physics and Maths) or B.Sc. (Applied Sciences)
2	BARC, Mumbai	Dip.In Radiological Physics(Dip.R.P)	1 Year	M.Sc. in Physics
		Diploma in medical radioisotope techniques (DMRIT)	1 Year	B.Sc(Chemistry, Physics/ Life Sciences/ Biotech./ Biochemistry/Microbiolog y/ Biophysics), B.Sc. (Nuclear Medicine Technology) or B.Sc. (Medical Radiological Technology)
		Diploma in Radiation Medicine(D.R.M)	2 Years	MBBS
3	University of Calicut	MSc - Radiation Physics	2 Years	B.Sc. (Physics, Chemistry and Maths)

4	Dept. Of Physics, Panjab University	M.Sc. in Medical Physics	2 Years	B.Sc. (Physics as the core subject). or B.Sc. (Radiotherapy, Biophysics, Radiodiagnosis and Medical Physics)
5	Mangalore University, Karnataka	M.Sc. (Radiation Physics)	2 years	B.Sc. (Physics and Maths)
6	Dept. Of Physics, Manipal Univ., Karnataka	M.Sc. (Medical Radiation Physics)	2 Years	B.Sc. (Physics and Mathematics)
		M.Sc. (Nuclear Medicine Technology)	2 Years	BSc (Nuclear Medicine Technology) with DNMT or DMRIT (Diploma in Medical Radio Isotopes Technology) or PG Diploma in Nuclear Medicine Technology or BSc (Medical Imaging Technology) or BSc (Maths, Physics and Biology)
7	Osmania Univ., Hyderabad http://www.osmania.ac.in /	Dip.In Radiological Physics(Dip.R.P)	1 Year	M.Sc. in Physics / Medical Physics / Nuclear Physics or an equivalent course
8	Inst. Of Nuclear Medicine	Diploma in	2 Years	MBBS

	and Allied Sciences, affiliated to Delhi University http://www.drdo.org/	Radiation Medicine(D.R.M)		
9	AIIMS, New Delhi http://www.aiims.edu/	M.Sc. (Nuclear Medicine Technology)	2 Years	B.Sc.(Physics, Mathematics and Biology) or DMRIT (Diploma in Medical Radio Isotopes Technology) or PG Diploma in Nuclear Medicine Technology
10	Bharathiar University, Coimbatore http://www.buc.edu.in/	M.Sc. (Medical Physics)	2 Years	B.Sc.(Physics and Mathematics)

**Dept. of Mathematics
Add-on Course**

Mathematics Software L^AT_EX

Text: L^AT_EX Tutorials – A Primer, Indian T_EX Users Group.

Here we introduce a software which is commonly used by people working in Mathematics-a science typesetting software L^AT_EX.

Course Outcome: This software can be used by people working in Mathematics and Science project/ theses typesetting. This has high scope for employability and is a good source of financial income.

Graphical User Interface (GUI)/ Editor like Kile or TeXstudio should be used for providing training to the students.

The main topics are the following

Module I

Chapter I: **The Basics** - What is L^AT_EX?, Simple Typesetting, Fonts, Type size.

Chapter II: **The Document** - Document class, Page style, Page numbering, Formatting lengths, Parts of a document, Dividing the document.

Chapter III: **Bibliography** - Introduction, *natbib*

Module II

Chapter V: **Table of contents, Index and Glossary** – Table of contents, Index, Glossary

Chapter VI: **Displayed text** – Borrowed words, Poetry in typesetting, Making lists, When order matters, Descriptions and Definitions

Chapter VII: **Rows and Columns** – Keeping tabs, Tables

Module III

Chapter VIII: **Typesetting Mathematics**- The basics, Custom commands, More on Mathematics, Mathematics miscellany, New operators, The Many faces of Mathematics, Symbols

Chapter IX: **Typesetting Theorems**- Theorems in L^AT_EX, Designer theorems- the *amsthm* package, Housekeeping

Chapter XII: **Cross References in L^AT_EX**- Why cross references? Let L^AT_EX do it, Pointing to a page- the package *varioref*, Pointing outside- the package *xr*.

Evaluation: Lab exam of 2 hours duration at the end of the course

References

1. Tobias Oetiker, Hubert Partl, Irene Hyna and Elisabeth Schlegl. The (Not So) Short Introduction to L^AT_EX₂ε, Samurai Media Limited (or available online at <http://mirrors.ctan.org/info/lshort/english/lshort.pdf>)
2. Leslie Lamport. L^AT_EX: A Document Preparation System. Addison-Wesley, Reading, Massachusetts, second edition, 1994
3. H. J. Greenberg. A Simplified introduction to L^AT_EX, available online at <https://www.ctan.org/tex-archive/info/simplified-latex/>
4. TeXstudio : user manual, http://texstudio.sourceforge.net/manual/current/usermanual_en.html

DEPARTMENT OF CHEMISTRY

Add on Course: Drinking Water Quality Analysis

Syllabus

Theory (15 hours)

(4 hours)

Module I: - Water quality parameters and their effects

Physical parameters- pH, Color (Hazen), odour, taste, turbidity, General parameters – Hardness, Total Dissolved Solids, Chloride, Sulphate, Nitrate, Fluoride, Calcium, Magnesium, Iron, Manganese, Heavy metals, Pesticides, Dissolved Oxygen, Coliform bacteria, Drinking Water Specifications – Indian Standards

Module II: -Procedures for the measurement of physical parameters

(3 hours)

Water sampling and preservation, Procedures for the measurement of pH, Conductivity and Turbidity.

Module III: -Procedures for the measurement of Chemical parameters

(8 hours)

Procedures for the measurement of total hardness, Chloride, Fluoride, Nitrate, Iron, Dissolved Oxygen, Biological Oxygen Demand, Heavy metals and Pesticides.

Practicals (7 hours)

1. Estimation of Hardness of water – by complexometric titration using EDTA (Ethylene diamine tetra acetic acid)
2. Estimation of Iron and Fluoride – by Colourimetry using UV-Visible Spectrophotometer.
3. Estimation of Physical parameters like pH, Conductivity, TDS (Total dissolved solids), Salinity, DO (Dissolved Oxygen) – using suitable probes in the water analysis kit.

Field Project (8 hours)

The students collect water samples from different localities, measure the various water quality parameters and prepare a water card as per the guidelines of CWRDM (Centre for Water Resources Development and Management, Kozhikode)

References

1. Standard Methods for the Examination of Water and Wastewater, APHA, AWWA and WEF, 22nd edition 2012.
2. ITRC (1999) Lecture Notes of Post Graduate Training Programme on 'Advanced Water Quality Instruments' under the technical assistance from Hydrology Project, October 11-23, 1999 at Industrial Toxicology research Centre, Lucknow.

3. Jain, C.K. (2003) Gas Chromatography and its applications for the Analysis of Pesticides, Proceeding of Workshop on Groundwater Contamination by Organic Pollutants organized by Japan International Cooperation Agency (JICA) in collaboration with CGWB, MOWR, GOI, pp.66-72.
4. Singh, K.P., Takroo, R. and Ray, P.K. (1987) Analysis of pesticide residues in water, Indian Toxicology research Centre, Lucknow, UP, ITRC Manual No.1, 78
5. Systematic Experiments in Chemistry "Arun Sethi"
6. "Instrumental Methods of Chemical Analysis" Gurdeep R Chatwal and Sham K Anand.
7. "Environmental Chemistry" Ajaykumar Bhagi and G.R.Chatwal.
8. "Methods in Environmental Analysis : Water, Soil and Air" P.K.Gupta

**FATIMA MATA NATIONAL COLLEGE
(AUTONOMOUS), KOLLAM**

Syllabus and Textbooks

Add on Course

Name of the course : 'Communicative Hindi'

Prescribed Textbook
Bolchal Ki Hindi aur Sanchar

By Dr. Madhu Dhavan

Vani Prakashan

Module I Bolchal Ki Hindi

Conversations in Home, Picnic place, Rail Journey, Bank, Hospital, Police Station and in a phone call should be studied.

Application letter for Employment should be studied.

Module 2 Technical Terminology

Text - Bolchal ki Hindi aur Sanchar

Module 3 Grammar

Text Book - Vyavaharik Hindi Vyakaran

By Dr. H. Parameswaran

Radhakrishna Prakashan, Delhi

Kal (Tense) only

Books for General Reading

1. Bolchal ki Hindi - Dr. Suseela Gupt
Lokbharathi Prakashan
2. Hindi Patrakaritha - Mahendra Kumar Mishra
Rashtreeya Hindi Sahitya Parishad
3. Subodh hindi Vyakaran - Dr. Meenakshi Agarval
Rajkamal Prakashan

DEPARTMENT OF COMMERCE.

Add on course in Applied Business Accounting.

The add on programme runs through six semesters of the undergraduate programme, one paper in each year covering two semesters (S1&S2, S3&S4 and S5&S6). The following are the papers to be covered in each year.

1. Essentials of Applied Book-keeping.
2. Basic Accounting Applications
3. IT Based Applied Accounting.

After having been successfully completed the paper Essentials of Applied Book-keeping during the first year of the U G programme the candidate is considered completed certificate programme. The successive and successful completion of the paper, Applied Accounting and AS, the candidate will be awarded a diploma. Similarly, on completion of all the three papers in the third year, the candidate will be awarded advanced diploma.

Course objectives/outcomes

The overall objective of the programme is to enable the students to handle independently the accounting vocation in industries under different organisational set up. It also facilitates them in continuing advanced studies in professional accounting. The following are specific objectives:

1. To equip the students with strong practical fundamentals in applied book keeping.
2. To enable the students on applied aspects of preparation of general purpose financial statements and to elicit information there from.
3. To familiarise the students about Indian Accounting Standards in professional accounting practices.
4. To make the students capable of preparing and generating electronic form of accounting information.
5. To enable the students to explore advanced level applied aspects of accounting and to pursue themselves for professional accounting programmes.

Paper I: COA 101 - Essentials of Applied Book-keeping.

No. of instructional hours: 30

Aim of the paper: To equip the students with the preparation of accounts of various business areas and to acquire strong practical fundamentals in applied book keeping.

Course Objectives

1. To create conceptual and practical awareness on accounting cycle.
2. To enable the students to understand the underpinnings bill transactions.

Module 1: Review of accounting cycle-I : Financial information – Concepts and conventions – Journal – Ledger – Subsidiary books.

(10 Hrs)

Module 2: Review of accounting cycle-II : Errors and rectification – Bank reconciliation statement – Bill Transactions - Trial balance.

(10 Hrs)

Module 3: Financial Statements : Final accounts with advanced adjustments – Balance sheet – Significance and implications.

(10 Hrs)

Structure for preparing question paper: Theory 20% , Problem 60% and Practical 20%

Books Recommended:

1. Gupta R.L. and Radhaswamy. M. *Advanced Accountancy*, Sultan Chand & Sons, New Delhi.
2. Shukla M.C., Grewal T.S and Gupta S.C. *Advanced Accounts*, S. Chand & Co. Ltd., New Delhi.
3. Jain S.P. and Narang. K.L. *Advanced Accountancy*, Kalyani Publishers, New Delhi.
4. Naseem Ahmed, Nawab Ali Khan and Gupta M.L. *Fundamentals of Financial Accounting Theory and Practice*, Ane Books Pvt. Ltd., New Delhi.
5. Maheswari S.N. and Maheswari S.K. *Advanced Accountancy*, Vikas Publishing House, New Delhi.
6. Mukkerji & Haneef. *Advanced Accountancy*, TMH, New Delhi.

Paper II: COA 201 - Basic Accounting Applications

No. of instructional hours: 30

Module I: Cash flow analysis - Cash Flow statement– meaning- objectives and uses-differences between Cash Flow Statement and Fund Flow Statement- Preparation of Cash Flow Statement.

(6 hrs)

Module II: Fund flow analysis - Fund flow statement- Meaning - objectives-uses of Fund Flow statement- differences between Fund Flow Statement and Balance sheet- differences between Fund Flow Statement and Income statement- Preparation of Fund Flow Statement.

(6 hrs)

Module III: Ratio Analysis – Meaning – Importance – Temporal analysis and cross sectional analysis – Liquidity ratios – Solvency ratios – Profitability ratios – Leverage ratios – Coverage ratios – Interrelationships between ratios – Preparation of Final statements using ratios (simple problems)

(18 hrs)

Books Recommended:

1. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*, Tata McGraw Hill Co. New Delhi
2. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
3. Man Mohan, Goyal S.N. *Principles of Management Accounting*, SahityaBhawan Publications, Agra.
4. ShashiK.Gupta and Sharma R.K. *Management Accounting*, Kalyani Publishers, New Delhi.
5. Gupta S.P and Sharma R.K. *Management Accounting*, SahityaBhawan Publications, Agra.
6. Kulshustia and Ramanathan. *Management Accounting*, Sultan Chand & Sons, New Delhi.
7. Maheswari S.N. *Management Accounting and Financial Control*, Sultan Chand & Sons Delhi.
8. Pandey I.M *Principles of Management Accounting*, Vikas Publishing House, New Delhi.
9. Khan M.Y & Jain P.K. *Management Accounting*, Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
10. Revi M. Kishore. *Management Accounting*, Taxman Publications Pvt.Ltd., New Delhi.

Paper III: COA 301 - IT Based Applied Accounting.

No. of instructional hours: 30

Aim of the course: To update and expand the skills in the application of accounting packages.

Course objectives:

1. To expose the students to computer application in the field of Accounting.
2. To develop practical skills in the application of Accounting Package.

Module I: Company creation and set-up of accounts in Tally (8.1 or higher version), Creation of a Company, Alteration, deleting, and shut a Company - concepts of Grouping of Accounts – Predefined account groups, display or alter groups. Creating Ledger Accounts – Predefined ledger accounts, creation, display, alter and deleting ledger accounts - Inventory – items, groups, units, creating a single stock group, creating a multiple stock group, stock items.

(10Hrs)

Module II: Accounting vouchers: - Vouchers, Types of Vouchers , Creation of Voucher type, Types of accounting Vouchers , Cost centre and cost category, interest calculation, Reversing journals and optional voucher, Memorandum Voucher - Inventory vouchers – stock journal, Stock category, bill-wise details, multiple Godowns, - Working with payroll info menu- payroll configuration - pay roll vouchers- payroll reports

(10 Hrs)

Module III: Report Generation and Printing - Display of Trial balance, profit and loss accounts, balance sheets, consolidated statements companies/branches. printing reports.

(10 Hrs)

Recommended Practicals: Application of Tally - creation of companies; creation of primary groups, secondary groups; creation of ledgers; creation of inventory – items, groups, units etc.; Creation of different types of vouchers; bills wise details; interest calculation, creation of godowns; Preparing, display and alter books of accounts, preparing stock reports, stock query, branch accounts, invoices, and price list and bank reconciliation statement.; Creating payroll vouchers , Generating fund flow statements, ratio analysis statements, budgets; preparation of TDS return. ; Generating Trial balance, Profit and Loss Accounts, Balance Sheets,

Books Recommended:

1. Institute of Computer Accountants .*Tally*, Vikas Publishing House, New Delhi.
2. Tally Academy .*Tally Manual*.
3. TALLY 9 Upto release 3.0, Computech Publications Ltd., New Delhi.

FATIMA MATA NATIONAL COLLEGE (AUTONOMOUS), KOLLAM
DEPARTMENT OF ECONOMICS
ADD ON COURSE
(Skill Enhancement Course)

DATA ANALYSIS

Course Description:

This course introduces the student to collection and presentation of data. It also discusses how data can be summarized and analyzed for drawing statistical inferences. The students will be introduced to important data sources that are available and will also be trained in Excel Software to Analyse data.

Course Outline:

1. Sources of data. Population census versus Sample surveys. Random sampling.
2. Univariate frequency distributions. Measures of central tendency: mean, median and mode; arithmetic, geometric and harmonic mean. Measures of dispersion, skewness and kurtosis.
3. Bivariate frequency distribution. Correlation and regression. Rank correlation.
4. Estimation of population parameters from sample data. Unbiased estimators for population mean and variance.
5. Basics of index numbers: price and quantity index numbers.
6. Introduction to data analysis – Excel tables- Basic pivot tables-Dashboards- Profitability Analysis-Comparing year over year in pivot tables- Reporting Hierarchical data- multi table pivot tables.
7. Describe data using charts and basic statistical measures, defining Data, Histograms and Skewness, Descriptive Statistics with Analysis Tool Pack, Boxplots, Categorical Data, Pivot Tables, and Pivot Charts, Summarizing Hierarchical Data-using Excel

Readings:

- 1 Tamhane, Ajit C., and Dorothy D. Dunlop. Statistics and Data Analysis: From Elementary to Intermediate. Prentice Hall, 1999.

2. M.R. Spiegel (2003), *Theory and Problems of Probability and Statistics* (Schaum Series).

Add on Course

Proficiency in English and Soft Skills

Duration : 30 Hours

Course Objective

Today's world is all about relationship, communication and presenting oneself and one's ideas in the most positive and effective way. Language is the most commonly used medium of self-expression in all spheres of human life-- personal, social and professional. A student must have a fair knowledge of English language and the skills to communicate effectively in order to handle various jobs in future. The objective of this course is to enable the students to acquire proficiency, both in spoken and written language.

Course Outcome

At the end of the course, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills and enhance skills in spoken English. In addition the student can cultivate basic interpersonal communicative skills and soft skills. Eventually the student can achieve excellence in both personal and professional life.

Module I

Grammar and Vocabulary

Introduction to parts of Speech –articles –comparative adjectives – the difference between countable and uncountable nouns – application of tenses –imperatives – different question types .Building up English words of daily usage with correct pronunciation.

Module II

Principles of Communication

LSRW (Listening, Speaking, Reading and Writing) in communication. Definition— Significance—development of the Skills--Introduction to English Sounds / Rhythm.

Letter Writing: formal and informal-- Paragraph writing--, Writing Memos, Circulars, Notices, Reports, etc.

Listening: comprehension/ accent/ pronunciation.

Reading -Intensive and extensive.

Module III

Soft Skills

Introduction to soft skills – Developing positive attitude- Improving perceptions – Forming values – Interpersonal skills/understanding others – Team building – group dynamics – Net working – Improved work relationship – Developing body language – Practicing etiquette and mannerism – Stress management – Goal setting – Career planning.

Module IV

Practical Session

Listening to pre-recorded English Language Learning programmes

Paper reading before an audience (reading unseen passages)

Study of essentials of a good speech—to respond and comprehend visual themes, situations or stimulus and practice before select gathering.

Greetings for different occasions

Introducing oneself, others and leave taking.

Encouraging students to write blogs, tweet, text and email employing appropriate language

Group Discussion/ Interview/ Role play/ Debate

ADD ON COURSE
CERTIFICATE IN COUNSELLING

Enable the participants to gain firsthand knowledge about the basic counselling skills and techniques, and also empower them with the holistic aspects of counselling. Fine tuning of the skills is made possible through the practicum sessions and through the mandatory clinical hours required. Case reporting will also add to the experiential element. The focus and attention to the practicum sessions as well as the report submission requirements will increase the employability of the students of this course, and also provide them with a greater advantage over their peers in other institutions.

Module – I: Introduction

(4 hrs.)

Meaning – Definition - Goal, Scope, Qualities of an effective counsellor, Types and approaches to counselling (A brief overview) - Ethical and legal issues in counselling

Module – II: Counselling Relationship

(3 hrs.)

Nature of relationship – Physical setting – Privacy – Contracting – Setting boundaries & expectations – Empathy – Rapport building – Transference and Counter transference – Resistance.

Module – III: Counselling Skills

(3 hrs.)

Attitudinal skills: Respect, Unconditional Positive Regard, Empathy, Self – disclosure, Confrontation – Listening skills – Communication skills: Verbal and non-verbal – Leads: Restatement of contents, Asking Questions, Reflection of feelings, Reassurance, Interpretation and Feedback.

Module – IV: Steps and Processes in Counselling

(10 hrs.)

Client self-exploration – First interview – Initial Counselling session – Diagnosis – Deeper exploration and Analysis – Implementation – Follow up – Termination of Counselling relationship.

Practicum

A minimum of 10 Practical hours are considered mandatory for the completion of the course, supplemented by the submission of at least 4 counselling case summaries from different areas.

Reference

- Rao, N. & Shajpal, P. (2013). Counselling and guidance, New Delhi: McGraw Hill Education(India) Pvt. Ltd
- Nelson-Jones, R. (2002). Basic Counselling Skills. London: Sage.
- Seligman, L. W., & Reichenberg, L. W. (2013). Theories of Counselling and psychotherapy (4th ed.). New Delhi: Pearson.
- Gibson, R. L., & Mitchell, M. (2008). Introduction to Counselling and guidance. Upper Saddle River, NJ: Pearson/Merrill/Prentice Hall.
- Gladding, S. T. (2018). Counselling: A comprehensive profession.
- Singh, K. (2015). Counselling skills for managers. New Delhi: Prentice Hall India.

FATIMA MATA NATIONAL COLLEGE (AUTONOMOUS), KOLLAM.

ADD- ON COURSE OFFERED BY THE DEPARTMENT OF ZOOLOGY

AQUARIUM CONSTRUCTION AND MAINTENANCE

AIM OF THE COURSE:

To equip the student to construct an aquarium and also to master the technique of maintenance such that it enhances his chances of self-employability in the field of ornamental fish farming and trading.

OBJECTIVES OF THE COURSE

- To learn the scientific method of setting an aquarium
- To learn the culture of live feed and formulated feed of fish
- To identify the common diseases of ornamental aquarium fishes and their effective treatment.

SYLLABUS

DURATION: 30 HRS

MODULE I

(5 Hrs)

Importance and history of aquarium fish keeping. Design and construction of aquaria: aquarium fabrication- shape, size, volume, type of glass tank, cutting of glass, preparation of glass tank, strengthening and supporting of tank, fitting of tanks into room settings; aquarium floor setting- type and size of pebbles, gravels, granites used for bed setting and its advantages. Filters- biological, chemical and mechanical. Aquarium accessories like aerators, decorative, lighting, heating and feeding trays.

MODULE II

(3 hrs)

Water quality management in aquarium systems- sources of water, containers, storage, temperature, pH, dissolved CO₂, ammonia, hardness, turbidity and ozone in aquarium.

MODULE III**(4 Hrs)**

Aquarium plants: uses of aquarium plants, different varieties of plants like submerged plants (tubers, rooted plants, cutting plants) and emerged plants, indoor and outdoor plants, selection of plants, planting techniques, propagation and maintenance of aquarium plants. Advantages of natural plants over artificial plants.

MODULE IV**(8 hrs)**

Aquarium maintenance-setting up of a freshwater community tank and its maintenance. Food and feeding- live feed and formulated feed. Preparation and culture of live feed (Artemia, Infusoria, Spirulina). Control of algal growth, snails and other predators. Common diseases of ornamental aquarium fishes-their causative agents-virus, bacteria, fungi, protozoa and nematode; symptoms, treatment and prophylactic measures

MODULE V**(10 hrs)**

Hands-on training and practical session

Course Co-ordinator : Mrs. Nisha Thomas Panikkaveetil

ADD ON COURSE ON
“MUSHROOM CULTIVATION”

From

Post Graduate and Research Department of Botany

Fatima Mata National College

Kollam-1

Course Coordinator: Dr. B. Sinilal, Assistant Professor



COURSE CURRICULUM & SYLLABUS

With the motto of 'Earn while Learn', Post Graduate and Research Department of Botany, Fatima Mata National College, Kollam, is proposing an add-on course on 'Mushroom Cultivation'. The course will offer the basic concepts of mushroom growth, along with the hands on experience in cultivation of selected edible mushrooms. The course is designed in such way for attaining the major goals listed below:

1. Get an appreciation on the importance of embarking on self-employment and developing the confidence and personal skills for the same.
2. Identification of business opportunities in chosen sector / sub-sector and making a plan for marketing the products / services
3. Starting a small business enterprise by liaoning with different stake holders
4. Managing a small scale business enterprise
5. To equip for taking up Mushroom Cultivation as a profession and run it profitably
6. Selection of important types of Mushroom and their cultivation
7. Maintain Mushroom farm in a hygienic and scientific way
8. Work out the economics of Mushroom Cultivation
9. Take up value added products of Mushroom i.e. preparation of Mushroom Pickle, Powder, Papad and different items of Food

Distribution of Teaching Hours

Class room teaching	10 Hrs
Lab training	20 Hrs
Total Teaching Hours	30 Hrs

COURSE SYLLABUS

Unit: I Economic Importance of Fungi: Types based on usage-Edible, Poisonous, Pathogenic, Saprophytic, Industrial usage; Key to differentiate Edible from Poisonous mushrooms.

Unit: II Mushroom morphology: Different parts of a typical mushroom, general structure of fungal hyphae, morphology of fruiting bodies; Types of fungi- Epigenous & Hypogenous, Natural Habitats-Humicolous, Lignicolous & Coprophilous.

Unit: III Biology of Mushrooms: Button, Straw & Oyster- General morphology, distinguishing characteristics, spore germination and life cycle.

Unit: IV Health benefits of Mushroom: Nutritional value- Protein, aminoacids, carbohydrates , fats, vitamins & minerals and calorific value. Antiviral, antibacterial, antifungal and anti-tumour effects, haematological value cardiovascular & renal effects, in therapeutic diets, adolescence, for aged persons & diabetes mellitus.

Unit: V Cultivation System & Farm design: Fundamentals of cultivation system-small village unit & larger commercial unit. Principles of mushroom farm layout-location of building plot, design of farm, bulk chamber, composting platform, equipments & facilities , pasteurization room & growing rooms.

Unit: VI Compost & Composting: Principles of composting, machinery required for compost making, materials for compost preparation. Methods of Composting- Long method of composting (LMC) & Short method of composting (SMC).

Unit: VII Spawn & Spawning: Facilities required for spawn preparation, Preparation of spawn substrate, preparation of pure culture, media used in raising pure culture, culture maintenance, storage of spawn.

Unit: VIII Casing materials & Case running: Importance of casing mixture, Quality parameters of casing soil, different types of casing mixtures, commonly used materials.

Unit: IX Cultivation of Button, Oyster and Straw Mushrooms: Collection of raw materials, compost & composting, spawn & spawning, casing & case run, cropping & crop management, picking & packing. Visit to relevant Lab/Field.

BUDGET

Sl. No.	Item	Expenditure incurred (Rs.)
1	Remuneration for Resurce person (30 Hrs x Rs.500/-)	15,000.00
2	Laboratory facilities	25,000.00
3	Mushroom spawn	10,000.00
4	Organisational expenses	5,000.00
	Grand Total	55,000.00

F M M N C

PHYSICS DEPARTMENT
ADD-ON COURSE–RADIATION PHYSICS
SYLLABUS

Radiation (5 hours)

Definition, Types of radiation, Ionizing and non-ionizing radiation, Radiation Protection :Instruments for personnel monitoring, Contamination monitors for alpha, beta and gamma radiation. radiation exposure criteria.

Awareness about Mobile phone radiation(5 hours)

Radiation rate, biological effect of mobile phone radiation include cancer, electromagnetic hypersensitivity, tumor ,hereditary disorders, Autism etc.

Radiation Quantities and Units: (5 hours)

Radiation quantities and units -Absorbed dose- Radiation and tissue weighting factors, equivalent dose, effective dose, committed equivalent dose, committed effected dose – Concepts of collective dose ,Specific absorption rate.

Biological Effects of Radiation: (5 hours)

Somatic effects of radiation – Dependence on dose, dose rate, type and energy of radiation - Acute radiation sickness – Effects of chronic exposure to radiation – Radiation Carcinogenesis – – Genetic effects of radiation – Factors affecting frequency of radiation induced mutations – Dose-effects relationship – first generation effects – Effects due to mutation of recessive characteristics – Spontaneous mutation rate .

Practical (10 hours)

1. Estimate the radiation rate from mobile phones using radiation leakage detectors.
2. Comparison of specific absorption rate of different SIMs using same mobile phones.
3. Estimate the power densities of radiation for different instant of a long duration call.
4. Estimate the effective dose of gamma radiation.
5. Calculation of absorption rate of radiation of Wi-Fi from different rotors.

Radiation Physics –Add-on Course

Objectives

- Introduce the fundamentals in radiation physics.
- Introduce the radiation dose rate and the international limit of radiation.
- This course introduce the protective techniques about radiation.
- Outline the biological effects of both ionizing and non-ionizing radiation.
- Give awareness to young generation about the silent killer –the mobile phone radiation, and thereby save the incoming generation from hereditary disorders like autism, and other birth problems.

Outcomes

- Students will aware about the radiation dosimetry and international limit for ionizing and non-ionizing radiation.
- Students will understand the biological effects of radiation.
- Students will aware about the radiation protective measurements.
- Most significantly this course contain the biological effects of mobile phone radiation and its dosimetry.
- The knowledge about mobile phone radiation will save our young generation from the deep addiction of mobile phone.

CAREER OPTIONS FOR RADIATION PHYSICS

Given below is the tabulated details of the degree/diploma and the career options available in Radiation Physics.

S.No	Degree/Diploma	Essential Qualification	Career option
1	M.Sc.(Radiation Physics)	B.Sc.(Life Sciences /Physics/chemistry/mathematics)	Research, option for higher studies in radiation physics, Medical Physicist in Hospitals and Oncology Departments
2	M.Sc. (Medical Physics)	B.Sc.(Life Sciences /Physics/chemistry/mathematics)	Research, option for higher studies in radiation physics or medical physics, Medical Physicist in Hospitals and Oncology Departments
3	Dip.In Radiological Physics(Dip.R.P)	M.Sc. (Physics)	Radiation safety officer, in Hospitals as medical physicist, Oncology Dept. as Medical physicist.
4	Diploma in medical radioisotope techniques (DMRIT)	B.Sc. (Chemistry/Physics/ Life Sciences/ Biotech./ Biochemistry/ Microbiology/Biophysics), B.Sc. (Nuclear Medicine Technology) or B.Sc. (Medical Radiological Technology)	Nuclear Medicine centers, Cancer hospitals and radiological centers as Medical Physicist

Medical Physicist:

- The treatment of patients with radiation involves planning, dosimetry, quality assurance checks to be done meticulously in which the medical physicists play an important role.
- A lot of private hospitals are coming up with modern radiation therapy facilities in India and there is a definite demand for medical physicists. So the most shot of job for the medical Physicist is in the cancer hospitals.
- They can work alongside clinicians in providing scientific and technical expertise and conducting research.
- They are also qualified to serve as Radiological Safety Officers(RSO) in research and industrial institutions handling radioisotopes and ionizing radiations.

Radiation Physicist:

- The professionals with degree/diploma/training on radiation Physics can work as Radiological Safety Officers(RSO) in research and industrial institutions where ionizing radiations are used.
- Another area where radiation Physicist plays an important role is in increasing the shelf life of perishable agricultural products during large-scale packaging for export, the professionals are in demand in this sector too.
- Gamma irradiator is used in food irradiation plants to package the products. Along with this, Gamma irradiation can be used for irradiating seeds in order to make them fungal proof or disease resistance. So the radiation Physicist can have important role in all such places.

Educational Opportunities

Details of the Universities with courses offered, duration and minimum Qualifications are listed below:

S.No	University/Institution	Degree/Diploma	Duration	Minimum Qualification
1	Department of Physics, Anna University, Chennai http://www.annauniv.edu/	M.Sc Medical Physics	2 Years	B.Sc. (Physics and Maths) or B.Sc. (Applied Sciences)
2	BARC, Mumbai	Dip.In Radiological Physics(Dip.R.P)	1 Year	M.Sc. in Physics
		Diploma in medical radioisotope techniques (DMRIT)	1 Year	B.Sc(Chemistry, Physics/ Life Sciences/ Biotech./ Biochemistry/Microbiolog y/ Biophysics), B.Sc. (Nuclear Medicine Technology) or B.Sc. (Medical Radiological Technology)
		Diploma in Radiation Medicine(D.R.M)	2 Years	MBBS
3	University of Calicut	MSc - Radiation Physics	2 Years	B.Sc. (Physics, Chemistry and Maths)

4	Dept. Of Physics, Panjab University	M.Sc. in Medical Physics	2 Years	B.Sc. (Physics as the core subject). or B.Sc. (Radiotherapy, Biophysics, Radiodiagnosis and Medical Physics)
5	Mangalore University, Karnataka	M.Sc. (Radiation Physics)	2 years	B.Sc. (Physics and Maths)
6	Dept. Of Physics, Manipal Univ., Karnataka	M.Sc. (Medical Radiation Physics)	2 Years	B.Sc. (Physics and Mathematics)
		M.Sc. (Nuclear Medicine Technology)	2 Years	BSc (Nuclear Medicine Technology) with DNMT or DMRIT (Diploma in Medical Radio Isotopes Technology) or PG Diploma in Nuclear Medicine Technology or BSc (Medical Imaging Technology) or BSc (Maths, Physics and Biology)
7	Osmania Univ., Hyderabad http://www.osmania.ac.in /	Dip.In Radiological Physics(Dip.R.P)	1 Year	M.Sc. in Physics / Medical Physics / Nuclear Physics or an equivalent course
8	Inst. Of Nuclear Medicine	Diploma in	2 Years	MBBS

	and Allied Sciences, affiliated to Delhi University http://www.drdo.org/	Radiation Medicine(D.R.M)		
9	AIIMS, New Delhi http://www.aiims.edu/	M.Sc. (Nuclear Medicine Technology)	2 Years	B.Sc.(Physics, Mathematics and Biology) or DMRIT (Diploma in Medical Radio Isotopes Technology) or PG Diploma in Nuclear Medicine Technology
10	Bharathiar University, Coimbatore http://www.buc.edu.in/	M.Sc. (Medical Physics)	2 Years	B.Sc.(Physics and Mathematics)