MADURAI KAMARAJ UNIVERSITY

RASHTRIYA UCHCHATAR SHIKSHA ABHIYAN(RUSA)

National Higher Education Mission

ENTREPRENEURSHIP SKILL CAREER HUB

MKU-RUSA SKILL DEVELOPMENT COURSES

SKILLING OPPORTUNITY FOR STUDENTS AT MKU CAMPUS!

The enclosed list of skill development courses are planned to be offered to the students, scholars and administrative staff of MKU by the expert Faculty members and Experts in the field during October 2023 to January 2024. These courses are to be conducted in the week ends and in the evening hours without disturbing the regular classes or the examination schedules of the students, and to be held at MKU campus. The students are asked to select three courses of their choice. Based on students' selection, the high demand courses opted by the students, will be scheduled and conducted with the assistance of MKU-RUSA-SKILL HUB.

Maximise your employability with trailblazing Skill courses!

Submit Your Preferred Courses Before ***3rd October.***

Registration link: https://forms.gle/1GYdyiQjD3yZXpZcA

MKU RUSA SKILL HUB

Skill Courses to be offered during October 2023 – January 2024

Administration

1. Usage of Public Financial Management System
2. Procurement in Gem Portal

English Language

1. International English Language Testing System
2. Content Writing

Bioscience

1. Molecular Diagnostic Techniques
2. Real time PCR & Applications
3. Introduction to Bioinformatics
4. Good Lab practises & Diagnostic lab Accreditation
5. Bio printing, 3D Design and 3D Printing
6. Plant Genome Engineering
7. Analysis of Biological samples by – GC-MS/MS
8. Human Cellular Functional Assays
9. NGS – Genomic Data Analysis
10. Computing methods for Biologists- Primer for Genomic Data Analysis

Performing Arts

1. Digitizing Cultural Memories
2. Visual Ethnography

Artist Skills

1. Designing Jute based Products
2. Home Gardening
3. Floriculture/Flower Designing
4. Paraiyattam

Chemistry

1. In-Silico & Natural Product Drug design
2. Solar Water Splitting and Artificial Photosynthesis (SWAP)
3. Fundamentals of Electron Microscope (SEM & TEM) & Applications
4. Electrochemical and Optical Techniques for the Development of Biosensors
5. Industrial Metal Finishing
6. Nuclear Magnetic Resonance (NMR) Spectroscopy
7. Detection Tools for Molecules: Mass Spectrometry Techniques
8. Fundamentals skills on Chromatography Techniques
9. Fabrication and testing of Dyesensitized solar cells (DSSC)
10. Electron Microscopic techniques

Food Science

1. Entrepreneurship in Food Quality Management
2. Entrepreneurship in Food Industry
3. Food quality testing & certification

Political Science

Science Diplomacy

Energy Science

1. Solar Photo Voltaic(PV) system & Solar Thermal Device Testing
2. Energy Auditing & Management
3. Land Surveying
4. Basic Scuba Skills for under water diving

Linguistics & Communication

1. Multimedia Production
2. Linguistic skills for Business
3. Effective use of language
4. Internet for Tamil Language students
5. Natural Language Processing

Computer Science

1. Cloud Computing
2. Python
3. Algorithms using C & C++
4. Data analysis using Python & its libraries numpy, pandas & matplotlip

Agro Food Trade Centre

1. Grain processing (Laboratory Level)- Physical analysis, Parboiling, Milling, Cooking Analysis, Sensory Analysis
2. Nutritional Analysis of Food Products
3. Quality analysis of Edible Oil
4. Quality Analysis of Spices & Condiments
5. Quality Analysis of Jaggery and Sugar Products

Business Studies/Commerce - EXIM Trade skills

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SKILL DEVELOPMENT COURSE

International English Language Testing System

COURSE OBJECTIVES:

- To introduce the students to IELTS exam
- To acquaint the students with four section of IELTS
- To enable the student to understand the benefits of IELTS in academic and career
- To prepare students to take the exam and reach high band score

Attain your dream score
in IELTS
Test !

SCOPE OF IELTS

- If you want to work, study or migrate to countries like Australia, Canada, New Zealand & the UK, IELTS is mandatory.
- Career Opportunities
  - One can become IELTS trainer
  - In todays world there are lots of online applications that provides training on English communication. As IELTS measures your proficiency in English, you can become a Communication trainer in these platforms with better band score.
  - Wherever there is a demand for fluent English speakers, you will get a priority over there.

HIGHLIGHTS OF THIS COURSE:

- ✔ This course is mainly focused on improving the band score.
- ✔ You will be trained thoroughly with lots of practices.
- ✔ Grammar sessions included
- ✔ Umpteen number of mock test and practices will be covered in the classes.

Course Tutor: Ms. Laxmi Durga. S, RUSA Trainer

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SKILL DEVELOPMENT COURSE

Content Writing

COURSE MODULE

- ✔ Introduction to content writing
- ✔ Digital Content – Articles, Blogging & Webpages
- ✔ Copy writing
- ✔ Marketing collaterals
- ✔ E-mail writing
- ✔ Social Media writing
- ✔ Creative writing
- ✔ SOP & Business listing

WRITING SKILLS YOU WILL LEARN

Keyword Research, Blogging, Article Writing, Press Release, Product Description, Business Listing, Commercial Page, E-book, Book Review, Copy Writing, SOP, Resume, Portfolio, Email Writing, Social Media Writing, Instructional Booklet, Brochures, Flyers, Info graphic

TAKEAWAYS

- ✔ Knowledge of basic tools
- ✔ Writing techniques
- ✔ Learn the significance of research

Course Tutor: Ms. Laxmi Durga. S, RUSA Trainer

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SKILL DEVELOPMENT COURSE

Molecular Diagnostic Techniques

OBJECTIVES:

- To acquire the skills in Immunological and Molecular laboratory techniques
- Acquaintance to Laboratory maintenance and safety procedures
- To understand the ethics to be followed in biomedical research

COURSE CONTENT
Bio safety procedures in clinical laboratory Ethical guidelines for Biomedical Research
Laboratory Reagent preparation
Separation of serum from human peripheral blood Separation of plasma from human peripheral blood
Isolation of PBMC: Boyum's method
DNA from Human blood
Molecular genotyping of IFNɣ (+874T/A) using ARMS PCR
Agarose gel electrophoresis: Separation of PCR amplicons
Hands on - Agarose gel electrophoresis: Separation of PCR amplicons
Rapid Hepatitis B virus surface antigen in vitro screening test
Bacterial agglutination test: Widal & Sero-Diagnosis of Rheumatoid factor

SKILLS

1. Laboratory management skills 2. Safe Handling of Biological Samples 3. Hands on Training in Haematology, Immunological techniques, Molecular Diagnostic

Course Tutor: Dr. M. Jayalakshmi, Associate Professor and Head, Department of Immunology

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SKILL DEVELOPMENT COURSE

Real Time PCR & Its Application

OBJECTIVES:

- To acquire the skills in usage of Real Time PCR & its applications
- To impart the knowledge about the basics and principles of Real Time PCR
- To introduce the students to the developments in the field of Real Time PCR

COURSE CONTENT
Introduction to Real time PCR
Evolution of real time PCR
Principle and applications of real time PCR
Reagents and Requirements for Real time PCR
Primer designing and cyclic conditions for real time PCR
Importance of melting curve in real time PCR
Real time PCR amplification using SYBR Green method
Real time PCR amplification using TaQMan Method
Data Normalization and calculation of ΔCT and ΔΔ CT from Real time PCR generated CT values
Hands on training for PCR amplification using Real time PCR.

SKILLS

- ✔ Primer designing for Real Time PCR
- ✔ PCR by SYBR and TaqMan method
- ✔ Data normalization and internal control
- ✔ ACT and ACT calculation

Course Tutor: Dr. M. Jayalakshmi, Associate Professor and Head, Department of Immunology

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SKILL DEVELOPMENT COURSE

Introduction To Bioinformatics

OBJECTIVES:

- To acquire the skills in Basic Bioinformatics tools and techniques.
- To introduce the students to prominent bioinformatics and their applications.
- To impact bioinformatics skills to early researchers and post graduate

COURSE CONTENT
Introduction and major applications of bioinformatics
Multiple Sequence alignment and phylogenetic analysis
Primer designing and Restriction enzyme site analysis
Integrative gene finder for eukaryotic and prokaryotic genomes by Eugene
Metagenomic analysis by Megan software
Molecular Modelling of protein (Denovo and Homology)
Validation and visualization of protein structure
Drug docking on to the 3D structure of a protein receptor by glide software
Visualization of protein drug interaction
Protein structure upload in Protein Data Bank (PDB)

SKILLS

- ✔ Primer designing and gene finder
- ✔ Multiple sequence and Phylogenetic analysis
- ✔ Metagenomic analysis
- ✔ Molecular modelling
- ✔ Molecular docking

Course Tutor: Dr. Pravin Raj Solomon, Research Associate, Department of Immunology

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ENTREPRENEURSHIP SKILL CAREER HUB

SKILL DEVELOPMENT COURSE

Good laboratory practises and diagnostic lab accreditation process

OBJECTIVES

- To understand the ethics to be followed in biomedical research.
- To acquire knowledge on requirements for establishing a commercial diagnostic laboratory

COURSE CONTENT
Good laboratory practises
Bioethics
Discussion on: Need and scope of accredited laboratories
Accreditation process – an overview
Introduction to Laboratory Accreditation, International perspective & Quality system for laboratories
Accreditation criteria & their interpretations: - Management requirements (IS/ISO 15189)
Accreditation criteria & their interpretations: - Technical Requirements (IS/ISO 15189)
Accreditation criteria & their interpretations: - Technical Requirements (IS/ISO 15189)

MAJOR TOPICS FOCUSED

- ✔ Good laboratory practices
- ✔ Bioethics -Safe handling of biological samples
- ✔ Laboratory Management Skill
- ✔ Bio entrepreneurship - Provides a guideline for establishment of diagnostic laboratory

Course Tutor: Dr. R. Shobana Manoharan, Research Associate C/o Dr. M. Jayalakshmi, Department of Immunology

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SKILL DEVELOPMENT COURSE

BIO PRINTING, 3D DESIGN, AND 3D PRINTING

Course Content

1. 3D Printing and Its Applications
2. Introduction to 3D Printing & 3D
3. Designing using Creo
4. Slicing (Prusa) & 3D Printer Demonstration
5. 3D Printing (FDM & SLA)
6. Two-Photon Laser Assisted Biofabrication in Regenerative Medicine & Bioinks for Bioprinting
7. Introduction to Bioprinting and Its Versatile Applications
8. CELLINK Bio X Bioprinter Demonstration
9. Advancement in 3D Bioprinting sector
10. Demonstration of HiMedia - NBIL Bioprinter
11. Demonstration of
12. HiMedia - NBIL Bioprinter

Course Tutor: Dr. S. Chandrasekaran, Chairperson & Head, Dept. of Plant Morphology and Algology

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SKILL DEVELOPMENT COURSE

Plant Genome Engineering

COURSE CONTENT

Paper C101: Plant Genome Engineering (Theory)
Organization of plant nuclear genes, mitochondrial and chloroplast genes. Agrobacterium and crown gall Ti plasmid vectors, plant transformation, and microprojectile bombardment. Plant genetic engineering for herbicide resistance, pest resistance, fungal resistance and other abiotic stress resistance. Biosafety issues in transgenic plants and genome edited plants.

Paper C102: Plant Functional Genomics (Theory)
Physical organization of plant genomes – Arabidopsis and Rice, Targeted genome editing – ZFNs,
TALENs and CRISPRs. Forward and reverse genetics approaches – map-based cloning, T-DNA
tagging, transposon tagging, TILLING

CL101- Lab in Plant Genome Engineering Plant tissue culture – preparation of MS medium, shoot differentiation in tobacco, Triparental mating in Agrobacterium, electroporation based transformation of Agrobacterium, DNA extraction in Agrobacterium, DIG-based Southern hybridization to confirm transformation of Agrobacterium. Agrobacterium-mediated transformation of tobacco, detection of GUS/GFP in transgenic plants, DNA extraction from transgenic plants, Southern hybridization analysis for T-DNA integration (Demonstration), and transgene copy number determination. Maintenance of transgenic plants in the greenhouse.

Scope of the course

Biotechnology companies and Research Centers with crop improvement programs require expert with practical training in recombinant DNA methods and plant genome engineering. The Course in Plant Genome Manipulation is designed to generate aptitude in research and to provide intense practical training in plant genome engineering to Postgraduate students who aspire for a career in Plant Biotechnology. The course will train students to specialize themselves in the area of Plant Biotechnology (Agriculture and Life Sciences Sector).

Course Tutor: Dr. G. Sridevi, Assistant Professor, Department of Plant Biotechnology

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SKILL DEVELOPMENT COURSE

Analysis of Biological Samples by –GC-MS/MS

Course Tutor	B.Mahalakshmi & Team, SBS, MKU
Duration	60 hours
Objectives	Introduction to GC-MS/MS & Metabolomic studies with GC-MS/MS
Instrument	Shimadzu's GC-MS/MS TQ8040 NX Series

TOPICS
Introduction to GC-MS - Principles of Mass Spectrometry - Injection & Ionization Techniques
Instrumentation part of GC-MS/MS
Pre-Acquisition – Column Conditioning, Tuning & Calibration - Selection of column
GC-MS Analysis of Metabolomics
Sample preparation & analysis of metabolites by GC-MS analysis of Plant extracts
Sample preparation & analysis of metabolites by GC-MS analysis of Cell Lines
Sample preparation & analysis of metabolites by GC-MS analysis of Tumour /Tissues
Sample preparation & analysis of metabolites by GC-MS analysis of Bacterial Cell Supernatant
Sample preparation & analysis of metabolites by GC-MS analysis of Blood Serum
Qualitative and Quantitative analysis - Library Search & Report Generation
Interpretation of Results
Maintenance & Trouble shooting the errors of GC-MS (related to gas inlet, Column selection)

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SKILL DEVELOPMENT COURSE

NGS - Genomic Data Analysis

Course Tutor*:* Prof.G.Kumaresan & Team, Dept of Genetics, SBS, MKU

No	Topics	Description of the Training
1	NGS Platforms	Introduction, Types and their advantages and limitations – Whole genome sequencing, Whole exome sequencing, RNA-Seq.
2	Basic Linux commands & File formats	FASTA, FASTQ, BAM, SAM, VCF, BCF, BED
3	Data pre-processing and Quality control:	Demultiplexing, Adaptor/low quality read trimming, Merging of paired end sequences – Seqprep, Quality check and Quality filtering - FASTQC
4	Genome mapping	Retrieval & pre – processing of reference genomes, Genome aligners – principle / tools - BWA, Bowtie2, MUMmer, HISAT2, STAR, TopHat2.
5	RNA-Seq analysis -	Differential Gene Expression Analysis Alternative splicing - AltAnalyze
6	Duplicate removal and refinement	Samtools, GATK (The Genome Analysis Toolkit)-Picard.
7	Variant Prediction analysis	SnpEff: Genetic variant annotation and functional effect prediction toolbox, SnpSift – Variant filtering, Ensembl - Variant effect Predictor (VEP). Mutation analysis – Mutationtaster, Mutscape, GATK-Mutect2, M-CAP, InMeRF, Mupro, i- mutant, Consurf, MutPred2, VarScan
8	Microarray Data analysis	Introduction, raw data normalization, differential gene expression (TAC & GEO2R), alternative splicing (TAC), pathway activation using Zscore calculation, hierarchical clustering using Dchip, gene set enrichment analysis.

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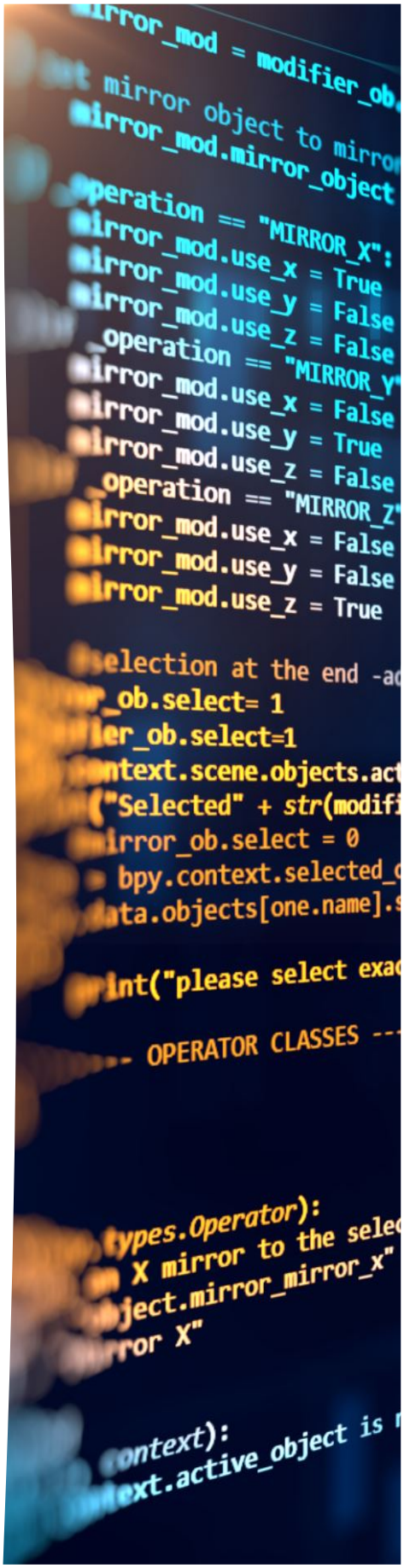
SKILL DEVELOPMENT COURSE

COMUTING METHODS FOR BIOLOGISTS – Primer for Genomic Data Analysis

Course Tutor: Prof.Kumaresan & Team, Dept of Genetics, SBS, MKU

- Basics of Python for Genomics – Control Statements, List, Dictionary & Packages
- Basic Linux commands for Genomics - Control Statements, Regular Expressions & Piping Commands
- Understanding the working background of Pipelines
- Working with Google Colab Online Environment
- Working with Microsoft Visual Studio Offline Environment
- Working with AWS Environment – Setting up the AWS Account, Storing the Data & Running the Pipelines
- Working with Docker – Installation, Pulling & Running the Docker Images
- Working with GPU – GPU based Scripts and Commands
- Tricks and Tips for Handling the Computational Genomic Analysis



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SKILL DEVELOPMENT COURSE

Human Cellular Functional Assays

Course Tutor: Prof.G.Kumaresan & Team, Dept of Genetics, SBS, MKU

- ✔ Cell Line Revival, Culture and Storage Methods
- ✔ Analysis of gene expression across cell lines by semi- quantitative RT-PCR
- ✔ Analysis f genes expression across cell lines by quantitative RT-PCR
- ✔ Killing curve assay for eukaryotic selection markers
- ✔ Transient gene silencing in cell line by liposome mediated siRNA transfection
- ✔ Analysis of the impact of gene expression in human cell proliferation
- ✔ Transient exogenus gene expression in human cell line
- ✔ Engineering of human cell line to continuously express the gene of intrest
- ✔ Stable gene silencing by shRNA plasmid transfection
- ✔ Analysis of protein expression in cell lines by reverse transfection
- ✔ Gene overexpression in human cells by reverse transfection
- ✔ Analysis of signaling pathway activity in human cell lines by dual luciferase reporter assay
- ✔ Impact of the modulation of gene expression on signaling pathway
- ✔ Anlysis of anchorage-independent growth property of human cells
- ✔ Determination of the in-vitro toxicity of a compund on a cell line
- ✔ Investigation of the epigenomics repression of a gene expression in cell line
- ✔ Analysis of cellular differentiation in human cell lines
- ✔ Elucidation of the transcriptional regulation of gene promoters by reporter assay
- ✔ Analysis of cellular apoptosis by flow cytometer
- ✔ Cell cycle phase analysis of human cell lines by flow cytometer
- ✔ Analysis of pluoripotency marker expression in human cell lines by flow cytometry
- ✔ Investigation of the cellular localization of the protein of interest by immuno staining
- ✔ Monitoring of protein expression and localization of the protein of interest by immuno staining
- ✔ Cytochemical staining of autophagosomes in human cell lines
- ✔ Gene silencing by nanoparticles mediated siRNA delivery

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SKILL DEVELOPMENT COURSE

In-Silico Natural Products Drug design

COURSE CONTENT
Role of Natural Products (NP) in Drug Discovery: Case studies of taxol, penicillin, camptothecin, etc.
Ethnopharmacology Based NP Drug Discovery: Case studies of the development of drugs from folk medicine: e.g., Withaferin A, Curcumin
Challenges associated with NP drug discovery
New Trends in the Field of Natural Product Drug Discovery: Multidisciplinary approach to natural products drug discovery using innovative technologies
Introduction, the procedure followed in drug design, the research for lead compounds, molecular modification of lead compounds. Structure-Activity Relationship (SAR)
Quantitative structure-activity relationship (QSAR): Development of QSAR, drug-receptor interactions, the additivity of group contributions
Physico-chemical parameters, lipophilicity parameters, electronic parameters, ionization constants, steric parameters, chelation parameters, redox potential, and indicator variables.
Combinatorial library for constituents obtained from natural resources, extracts used for developing new drugs.
Screening: Hands-on training for the screening of natural compounds from the natural products library through the Stardrop software
Pharmacokinetic and Pharmacodynamic analysis: Hands-on training for the dynamic simulation analysis and drug & receptor interactions of the screen compound through the SeeSAR

Course Tutor: Dr. M.Rajan, Assistant Professor, Department of Natural Products Chemistry

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SKILL DEVELOPMENT COURSE

Solar Water Splitting and artificial photosynthesis(SWAP)

About Solar Water Splitting and artificial photosynthesis(SWAP)

This international Workshop/Summer School & Course Preparation focuses on theconversion of solar energy into electrical energy using solar cells,chemical energy via PEC ,fuel cells,artificial photosynthesis and related materials as well as theoretical and experimental methods for the studey of materials and devices. The program is designed in collaboration with japan,France,Norway and India.SWAP-2033 aims to provide a platform toyoung researchres on the latest developements in these topicsand their prospects The lectures and presentations at the SWAP-2023,will reflect the progress in theabove mentioned topics Participants can showcase their work in progress in oral and poster presentations,receive feedback/suggestions on their projects and make valuable academic contacts in a brainstorming session. The participants can also get individual support combined with opportunities for formal dialogues with lecturers and peers.A short demo and trainingon solar cells characterization and electrochemical workstation will be arranged for the participants to feel the real time performance of the devices.

Course Tutor: Dr. M. Jeyanthinath, Associate Professor
Department of Materials Science

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SKILL DEVELOPMENT COURSE

SEM & TEM

We inform that the Madurai Kamaraj University Centralized instrumentation center is planning to conduct a Skill-based Training on SEM-TEM under RUSA 2.0 to the final year PG students of our Science Schools. In this regard, we would request the School Chairperson and the respective Department Heads to circulate the Flyer among your final year students and encourage them to register their participation for the training session. Based on the number of registered participants, the schedule shall be finalized with the student list.

Aim & Scope of The Training

The "Electron Microscopy Training" is organized to provide basic knowledge of the capabilities and limitations of Electron Microscopes (SEM-TEM) to the Post Graduate students and Researchers in Physics, Chemistry, Biology, Biotechnology and Material Sciences. It will help the participants in selecting the type of electron microscopy best suited for their work. The workshop includes lectures on sample preparation and theoretical aspects of Electron Microscopy, demo sessions by the experts.

Course Highlights

- Interactive Lecture session
- Demo with Different type of samples
- Participation Certificate

Course Tutor: Mr. Sivan, RUSA Trainer

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SKILL DEVELOPMENT COURSE

Electrochemical and Optical techniques for the Development of Biosensors

OBJECTIVES

- To understand the role of electrochemical and optical techniques the developmentof biosensors
- To understand the role of Biosensors for real world applications and the benefits of miniaturized electrochemical and optical devices (implantablesensors) for humans.
- To detect biomarkers like a dopamine, Urea, Uric acid, Glucose, food adulteration using various electroanalytical techniques

CONTENT

Theory intensive

1) Introduction of electrochemistry and electrochemical techniques.
2) Introduction of molecular spectroscopy and optical techniques.
3) Introduction of Biosensors
4) Applications of electrochemical and optical techniques in the development biosensors

Practical intensive

2) Hands on training on electrochemical analyser and UV-Vis spectroscopy towards the developments of the biosensors.
   - Cyclic Voltammetry (CV)
   - Electrical Impedance Spectroscopy (EIS)
   - Differential Pulse Voltammetry (DPV)
   - Chronoamperometry (CA)
   - Colourimetry and Fluorometry

Course Tutor: Dr. V. S. Vasantha, Head & Chairperson
Department of Natural Products Chemistry

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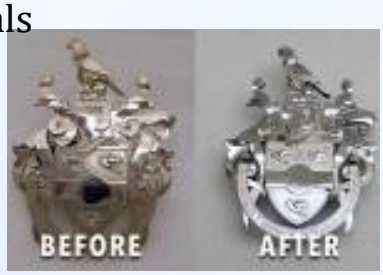
ENTREPRENEURSHIP SKILL CAREER HUB

SKILL DEVELOPMENT COURSE

Industrial Metal Finishing

Objectives

- Understand the basic process for the suberate surface treatment
- To understand the basic principles of electro plating of various metals and alloys
- Hands-on training on basic operations of various electroplating of various metals



Syllabus:

Theory intensive

1) Understand the basic process for the suberate surface treatment
2) To understand the basic principles of electroplating of various metals and alloys
3) Hands-on training on basic operations of various electroplating of various metals

Hands-On Training

1) Optimation of electroplating conditions of various metals (Ni, Cu, Zn), by using following electrochemical techniques
    1. Hull Cell Test
    2. Haring - Blum Cell
    3. Current efficiency calculation
    4. Current density calculation

Course Tutor: Dr. V. S. Vasantha, Head & Chairperson
Department of Natural Products Chemistry

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SKILL DEVELOPMENT COURSE

Nuclear Magnetic Resonance (NMR) Spectroscopy Spectrometry

Course Objective:

- This course can be offered in a hybrid format with lectures on fundamental and hands-on laboratory sessions.
- Each module will include lectures, reference materials, and assignments for self-assessment.
- Practical sessions will include NMR instrument operation, sample preparation, and spectral interpretation exercises.
- NMR spectra plotting training using NMRpipe, TopSpin, and MestReNova software with the help of recorded raw files.

COURSE CONTENT
Introduction to NMR Spectroscopy
Overview of NMR instrumentation
Small Molecules analysis and interpretation
Problem-solving approach
NMR Spectroscopy of Biomolecules
Solid State NMR
Sample Preparation
Solvent Selection
Training on Bruker Topsin and MestReNova Software

Course Tutor: Dr. P. Suresh, Assistant Professor
Department of Natural Products Chemistry

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SKILL DEVELOPMENT COURSE

DETECTION TOOLS FOR MOLECULES: MASS SPECTROMETRY TECHNIQUES

Course Objectives:

- To equip participants with a strong theoretical foundation in Mass Spectrometry principles.
- To provide hands-on training in the operation of Mass Spectrometry instruments and data analysis.
- To educate the participants to choose correct Mass Spectral Techniques for their application.
- To enable participants to confidently apply Mass Spectrometry techniques in their research or professional work.

Course Content
Fundamentals of Mass Spectrometry
Mass Spectrometer Instrumentation
Sample Preparation Techniques
Small Molecule analysis using GC-MS
Larger Molecules and Macromolecules analysis using LC-MS
Difference between Low Resolution mass (LRMS) and High Resolution Mass (HRMS)
Mass Spectrometry Data Analysis
Applications in Fine Chemical analysis, Medicinal Chemistry, Proteomics, Metabolomics, and Environmental Analysis
Advanced Topics and Emerging Trends

Course Tutor: Dr. P. Suresh, Assistant Professor
Department of Natural Products Chemistry

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ENTREPRENEURSHIP SKILL CAREER HUB

SKILL DEVELOPMENT COURSE

Fundamentals Skills on Chromatography Techniques

Course Objectives

- To learn the fundamentals and concepts of GC and HPLC instruments.
- To apply the knowledge of GC to analyse organic and pollutant molecules.
- To apply the knowledge of HPLC in metabolite separation.
- To apply the knowledge of HPLC in natural product separation.
- Programming and method development in HPLC for better separation.
- To understand the fundamentals and concepts of Pharmaceutical Method validation per ICH guidelines.
- To develop the skilled person as per the need of industrial requirements to smooth the function as well as to save the training period of new graduates entering the industries.

COURSE CONTENT
Separation and purification science in Natural products separation
Isolation of bioactive/ medicinal active molecules from plant sources.
Method development knowledge on natural product separation
Separation and purification science in the pharmaceutical Industry
Analytical techniques in quality control
Characterization of Natural Products and synthetic compounds.
How to choose suitable columns for separation.
Troubleshooting of GC and HPLC.

Course Tutor: Dr. P. Suresh, Assistant Professor
Department of Natural Products Chemistry

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SKILL DEVELOPMENT COURSE

Fabrication and testing of Dyesensitized solar cells (DSSC)

COURSE CONTENT
Overview of Energy resources
Introduction to renewable energy
Solar Cell Basics
Working Mechanism of DSSC
Hands on training to Fabricate DSSC
Testing of Solar cells

Course Tutor: Dr. M. Jeyanthinath, Associate Professor
Department of Materials Science

Madurai Kamaraj University

RASHTRIYA UCHCHATAR SHIKSHA ABHIYAN(RUSA)

National Higher Education Mission

ENTREPRENEURSHIP SKILL CAREER HUB

SKILL DEVELOPMENT COURSE

Electron Microscopic techniques

COURSE CONTENT
Optical microscopy and their limitations
Introduction to Microscopy techniques
Basics of Electron microscopy
Hands on training to sample preparation
Training on SEM handling

Course Tutor: Dr. M. Jeyanthinath, Associate Professor
Department of Materials Science

Madurai Kamaraj University

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ENTREPRENEURSHIP SKILL CAREER HUB

SKILL DEVELOPMENT COURSE

SCIENCE DIPLOMACY

COURSE BACKGROUND

The COVID 19 pandemic brought to the fore once again the imperatives of science diplomacy. Earlier science diplomacy did largely bind upon the frontiers of technology transfers across national boundaries. However, the Covid 19 pandemic has expanded the scope of science diplomacy beyond its conventional terrains by incorporating strategic and security concerns as well. Therefore, the Ministry of External Affairs of the Government of India has set up a New and Emerging Strategic Technologies (NEST) Division to engage in technology diplomacy and deal with the foreign policy and international legal aspects of new and emerging technologies.

OBJECTIVES OF THE COURSE

- Exploring the emerging science diplomacy discourses in India;
- Mapping the existing science, technology and innovation ecosystem in India;
- Technology transfer and Foreign policy of India
- Student Mobility and Collaborative Research – India and USA Student Mobility and Collaborative Research – India and European Union
- United Nations and regimes of science and technology treaties

COURSE OUTLINE
Indian Science Policy: Between Theory and Practice
Development, Environment & Science Policy in India
Economics of Science in India
Law and Science
Technology transfer and Democratization of Science
Student Mobility and Science Diplomacy of India

Course Tutor: Dr. R. Pavananthi Vembulu,
Assistant Professor, Department of Political Science

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Skill Development Course

Multimedia Production

Course Objectives

- To learn the Video and Media contents Editing, Enhancing Colour Digital Interface for quality improvement and better viewing experience, Integrating Textual Information and Adding Visual Elements through appropriate software's.

Course Content

Sl. No	Syllabus	Teaching Hours	Outcomes
1	Video Editing – Sequencing, Importing Audio/Video/Image/Mediafiles, Timeline Arrangement, Transitions, Effects & Effect Control, Key Framing, Green Matte, Masking and Rendering. - Adobe Premiere Pro	22 Hours	Raw Videos to Edited Video Content with Audio Video Editing
2	File Importing, Text Animation, Camera Tracking, Key framing, Masking, Compositing, Effects, SFX, Titling, and Rendering. – Adobe After Effects	18 Hours	Edited Videos to Adding Visual Effects
3	Enhancements of Visuals by adding Graphic, Visual Effects and Model Elements. - Blender	22 Hours	Edited Videos to Enhanced Videos
4	Colour Theories, Palettes, Family Colour Identifications. File Importing, Colour Grading, Colour Corrections, Selective Colour, Highlighting. – DaVinci Resolve	18 Hours	Edited Videos to Colour Graded Videos

Course Tutor: Dr. S. Nagarathinam, Head & Chairperson
Department of Communication

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Skill Development Course

Linguistic Skills for Business

Course Objectives:

- Understand how the Tamil and English languages are used in modern written and spoken communication in various business situations such as meeting, presentation, seller – buyer chats, etc.
- Use Translation strategies to convert English text in to Tamil and vice – versa.
- Employ the tactics of using both Tamil and English in a smart way with the stakeholders of business.
- Creatively use Tamil and English in business advertisements for selling and buying goods.

SI.NO	Course title	Theory
I	Tamil in Business Structure of Modern Tamil in business domain – Phonological pattern, Graphological pattern, Morphological Pattern, Morphosyntactical Pattern, Syntactical Pattern, Semantic Pattern, Discourse Pattern.	05
II	English in Business Structure of Modern English in business domain – Phonological pattern, Graphological pattern, Morphological Pattern, Morphosyntactical Pattern, Syntactical Pattern, Semantic Pattern, Discourse Pattern.	05
III	Typology Typological Comparison of Communication processes in Tamil and English – Strategies – word formation- Technical term creation- Borrowing – Code switching and code mixing, etc.	10
IV	Business correspondence Emails – register, style, standard phrasing – notes and memos- business specific language phrases, terms and conventions.	10
V	Telephoning Checking and clarifying information – finance specific clichés, listening to different paralinguistic features, linguistic contexts etc.	10
VI	Translation Theory, Process, Product – Phonological, Morphological, Syntactical and Semantic issues and solutions in translations between Tamil and English.	10
	Total	50 Hrs.

Course Tutor: Dr. K. Umaraj, Associate Professor and Head, Department of Linguistics

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Skill Development Course

Enhancing Employability Skills

Course Objective:

- ✔ To train the students to identify the speech sounds of natural languages
- ✔ To enable the students to understand the manners and points of articulation of speech sounds
- ✔ To make them to acquire knowledge of speech production and equip the students to classify the speech sounds
- ✔ To equip the students to make them familiarity in pronunciation while employing both English and Tamil languages
- ✔ To make the students to understand the fundamental theories in Translation
- ✔ To equip them to translate the text from source language to target language in terms of Tamil and English
- ✔ To enable the students to write language content effectively in print media both in English and Tamil
- ✔ To make the students to analyze the language both in Tamil and English
- ✔ To enable the students as speech synthesizers data mining experts

Enhancing Skills:

- ✔ Phonetic skill
- ✔ Translation skill
- ✔ Media Personal skill
- ✔ Document analysis skill
- ✔ Speech synthesis and data mining skill

Course Tutor: Dr.R.Kumarasamy, Assistant Professor
Department of Linguistics

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Entrepreneurial, Innovation, Skill and Career Hub

Skill Development Course

Internet for Tamil Language Students

Course Objective:

✔Evaluate the usefulness of available resources and services in Tamil language and advising on how to eliminate the existing vulnerabilities and improve the functions in the future.

✔Improve the knowledge of students, who specialize in Tamil Literature to efficiently use Tamil websites. Make them recognize that it is their duty to help our language by bringing the Literature and Textbooks of ancient text writers that are on the verge of extinction to the internet. These websites will help us to carry Tamil Literature worldwide. This will be possible only if the Tamil learners have the required knowledge on the internet.

✔Corporate companies have understood the usage of websites in Tamil and have extended their service in Tamil language. The workshop will help participants to completely understand the use of some of these major web services like Google, Yahoo, Thatstamil for utilizing their available information.

✔The participant will also learn about the pros and existing cons of using the Tamil language on the Internet.

✔Publishing and reading Tamil Books on websites, e-journals, commercialization, researching on organizations that are currently involved in Tamil development on internet.

COURSE CONTENT
Tamil Software, Tamil Digital Dictionary
Tamil online Journal, Tamil you tube Creation
Tamil Application, Tamil Creation of Blocks

Course Tutor: Dr. B. Sankareswari, Assistant Professor
Department of Tamilology

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Skill Development Course

NATURAL LANGUAGE PROCESSING

The objectives of this Training programme

- The objectives of this Training programme is to provide an introduction in the field of Natural Language Processing for Tamil language and promote research in the area of Natural Language Processing for Tamil language among young researchers
- Also it provides a platform for sharing the knowledge among the Computer scientists, Linguists and Tamil scholars.

Course content	
1. Introduction to Natural Language Processing	2. Computational Linguistics
3. Spell and Grammar Checker	4. Data Mining
5. Information Retrieval and Information Extraction	6. Machine Translation
7. e-dictionary	8. CALL and CALT
9. Computer assisted Instructions	10. Text Corpora creation
11. POS tagging	12. HTML, XML language for documentation of languages
13. Phonetics and Phonology	14. Speech Corpora
15. Speech Labelling	16. Automating Speech Recognition
17. Text to Speech Synthesizer	18. Speech and Audio Coding
19. Speech to Speech Translation, Interactive Voice Response System	20. Speech Technology for disabled persons

Course Tutor: Dr. K. Umaraj, Associate Professor and Head, Department of Linguistics

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Entrepreneurial, Innovation, Skill and Career Hub

Skill Development Course

Solar Photo Voltaic(PV) System and Solar Thermal Devices Performance

Course Content:

Module-1	**Introduction to Solar PhotoVoltaics(PV) and Thermal Devices**	▪ **Overview of renewable energy sources** ▪ **Introduction to solar energy and its importance** ▪ **Basics of photovoltaic(PV) technology** ▪ **Types of solar cells and their characteristics** ▪ **PV System components and theor functions** ▪ **Basics of SolarThermal Devices** ▪ **Types of Solar Thermal Devices and their Characteristics** ▪ **Solar Thermal Devices components and their functions**
Module-2	Solar Radiation and Site Assessment	▪ Solar radiation fundamentals ▪ Measurement and estimation of solar radiation ▪ Factors affecting solar panel performance ▪ Site assessment techniques for optimal solar panel placement
Module-3	Study the performance and Characterization of the Solar PhotoVoltaic(PV) panel	▪ Importance of efficiency in solar PV Systems ▪ Overview of efficiency calculation formulas ▪ Performance indicators: I-V curve, P-V curve, and fill factor ▪ Using software tools to model solar PV system efficiency ▪ Analyzing efficiency in different types of PV installations(residential, commercial, utility-scale)
Module-4	Solar Photo Voltaics(PV) Project Management	▪ Monitoring system performance-Remote monitoring technologies and tools ▪ Routine maintenance tasks and schedules ▪ Site Assessment and Design ▪ Sizing a PV System: load analysis, energy consumption, peak demand ▪ Liaisoning tasks for project management with Case Studies

Course Tutor: Prof. C. Gobinathan, Professor & Head
Department Of Solar Energy

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Skill Development Course

Energy Auditing and Management

Course Content

Module-1	**Fundamentals of Energy Auditing**	▪ **Understanding the Importance of Energy Audits** ▪ **Types and benefits of Energy Audits** ▪ **Energy Audit Process Overview** ▪ **Energy Management Systems and Standards**
Module-2	Preliminary Assessment and Data Collection	▪ Site Visit and Preliminary Walkthrough ▪ Energy Consumption Data Collection ▪ Utility Bill Analysis and Energy Benchmarking ▪ Building and Process System Documentation
Module-3	Energy Audit Techniques	▪ Energy Measurement and Instrumentation ▪ Energy Performance Indicators(EPI'S) ▪ Thermal Imaging and Non-Destructive Testing ▪ Energy Audit Software and Tools
Module-4	Analysis, Recommendations and Reporting	▪ Energy Audit Data Analysis ▪ Identifying Energy Saving Opportunities ▪ Cost-Benefit Analysis and ROI Calculations ▪ Developing Energy Conservation Measures(ECM's) ▪ Prioritization of Recommendations ▪ Report Writing and Presentation Skills

Course Tutor: Prof. C. Gobinathan, Professor & Head
Department Of Solar Energy

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Entrepreneurial, Innovation, Skill and Career Hub

SKILL DEVELOPMENT COURSE

Land Surveying

Land surveying is a vital profession that combines mathematics, technology, and equipment to measure and map various terrains. It has a rich history dating back thousands of years and plays a crucial role in modern infrastructure development. This course will empower students with the knowledge and expertise needed for this high-demand profession.

Beneficiaries: The beneficiaries of this skill course will be postgraduate and research students from various disciplines who are interested in gaining expertise in land surveying. These courses will equip them with valuable skills and knowledge that can enhance their academic pursuits, research projects, and career prospects.

COURSE CONTENT
Introduction to Land Surveying Principles and Classification
Concepts of Surveying: Measurement of Distance and Angles, Accuracies and Errors
Photogrammetric Measurements and Basics of Geographic Information System (GIS)
Use of Modern Surveying Equipment: GPS, Total Stations, Ground-Penetrating Radar
Cadastral and Topographic Maps: Understanding Land Records
Practical Field Training and Observation Techniques
Development of Entrepreneurship Skills, Personality Development, and Effective Communication Skills

Course Tutor: Dr. R. S. Suja Rosa, Assistant Professor
DEPARTMENT OF ERAC

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SKILL DEVELOPMENT COURSE

Basic Scuba Skills For Under Water Diving

About the Skill development course

SCUBA is the acronym of 'Self Contained Underwater Breathing Apparatus'. There is plenty of opportunity for scuba diving and biotechnology skills in marine research. Commercial diving is one of the most lucrative diving career paths. Divers get employed in private industries or government. These employers offer jobs like underwater welding, underwater inspections, salvage, oil industry work like exploring or drilling, and underwater testing. Commercial divers are essentially underwater construction workers. Invariably to science students even arts students can learn the additional skill of SCUBA that will leverage a better mileage in their career for marine conservation surveys, marine archeology and also to carry out independent marine research projects in exploring valuable drugs from sea by exploring deep sea organisms.

Course Highlights

Duration : 10 days course
Each day 3 hour class

Course Tutor: Dr. M. Anand, Associate Professor & Head
Department Of Marine And Coastal Studies

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Entrepreneurial, Innovation, Skill and Career Hub

SKILL DEVELOPMENT COURSES

Digitizing Cultural Memories

COURSE CONTENT

Unit-1: Introduction to Cultural Heritage and Memory (5 hours)	· **Defining cultural heritage and its significance** · **Understanding the importance of preserving cultural memories** · **Exploring the challenges in safeguarding intangible cultural heritage** · **Overview of digitization and its role in preserving cultural memories**
Unit 2: Ethical Considerations in Digitization (5 hours)	· Discussing ethical implications in digitizing cultural materials · Addressing concerns related to intellectual property and copyright · Ensuring respectful representation of cultures and communities · Case studies on ethical challenges faced in digitization projects
Unit-3 : Digital Imaging Techniques (8 hours)	· Overview of digital imaging technologies for scanning artifacts and documents · Best practices for capturing high-quality digital images · Image resolution, Colour calibration, and file formats for preservation · Hands-on sessions with scanning equipment and software
Unit 4: Audio-Visual Archiving (8 hours)	· Techniques for digitizing audio recordings and oral histories · Preservation of video footage and motion pictures · Understanding metadata and indexing for audio-visual archives · Practical exercises in digitizing and archiving audio-visual materials

Unit 5: Digitizing Textual Materials (6 hours)	• **Methods for digitizing rare books, manuscripts, and other textual materials** • **Optical Character Recognition (OCR) for converting scanned text to editable digital text** • **Creating digital libraries and databases for textual materials** • **Ensuring long-term access and sustainability of digitized texts**
Unit 6: 3D Scanning and Virtual Reality (6 hours)	• Introduction to 3D scanning technologies for cultural artifacts • Creating 3D models and virtual reality experiences for cultural exhibits • Integrating virtual reality into cultural heritage preservation and education • Virtual reality hands-on session and practical projects
Unit 7: Metadata and Digital Preservation (6 hours)	• Understanding metadata standards and their importance in digitization projects • Developing metadata schemas for various types of cultural materials • Exploring digital preservation strategies and best practices • Creating backup and disaster recovery plans for digitized content
Unit 8: Cultural Heritage and Open Access (4 hours)	• The concept of open access and its application in cultural heritage digitization • Advantages and challenges of making cultural memories openly accessible • Identifying platforms and repositories for sharing digitized cultural content • Implementing open access policies and licenses for cultural heritage materials
Unit 9: Community Involvement and Collaboration (6 hours)	• Engaging with local communities in digitization initiatives • Collaborating with cultural institutions, museums, and libraries • Empowering communities to actively participate in preserving their cultural memories • Case studies on successful community-centered digitization projects
Unit 10: Presenting and Promoting Digitized Content (4 hours)	• Strategies for creating engaging online exhibits and cultural heritage websites • Utilizing social media and digital marketing to promote digitized cultural content • Measuring the impact and reach of digitized cultural memories • Final projects and presentations showcasing digitization outcomes

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SKILL DEVELOPMENT COURSES

VISUAL ETHNOGRAPHY

COURSE CONTENT

Ethnography

Definition – ethno, graph– Types of Ethnography: realistic, critical, post-modern, personal narrative ethnography - residence as research lab –etic and emic approach

Data collection

Field – Techniques of data collection: participatory observation, preparing field notes, taking interviews, conducting surveys – Tools for recording: audio, video and photos, sketches – importance of context

Documentation

Transcription: literal Transcription, Free Transcription – writing field reports – emic interpretations - Indigenous discourse – multiple allegories – cultural subject as source of scientific knowledge – construction of gender – ethnographic production: autobiography, gender.

Visual Ethnography

Making ethnography texts - Qualitative investigation – the need for thin description – interpreting culture - thick description – Clifford Geetz – Structure of ethnography: topography, environment, climate, settlement pattern, material culture, residence pattern, enculturation, subsistence economy, division of labor, customary laws, food, art, religion, kinship etc.

Report on Selected Topic

Selecting a field site – Selecting an element –Data collection in the field – Focus on observation – Classifying and analyzing the data – strategies for representing ethnographic data – Ethnographic description – Presentation of ethnographic study (Visual/Text)

Course Tutor: Dr. C. Justin Selvaraj, Assistant Professor & Head i/C,
Department of Fine Arts and Aesthetics

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Entrepreneurial, Innovation, Skill and Career Hub

SKILL DEVELOPMENT COURSE

EXIM Trade Skills

EXPORT PROMOTION CENTRE (EPC) is an arm of TNCCI, created with goal of hand holding entrepreneurs, MSME exporters to enter export market of India, in a sustainable basis. As a part of process of hand holding one of the core areas we focus is to impart Export and Import Trade knowledge to our members, to society, educational institutions and to other stake holders in the EXIM chain.

Course Content
Brief on EXIM Trade
Need of required industry skills for achieving targets
Documents involved in EXIM Trade
Role, process of pricing/costing for exports
Regulatory agencies and the required compliance
Role, importance, process of various modes of EXIM Trade logistics

Skills to be covered:

We are planning to interact with students in imparting skills covering knowledge, documentation, pricing /costing for exports, compliance (in terms of GST, customs, DGFT, Banks), logistics.

Course Tutor: Dr. D. Deepa, Assistant Professor Department of Management studies

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Entrepreneurial, Innovation, Skill and Career Hub

SKILL DEVELOPMENT COURSE

Designed Jute Based Products

Course Objective:

- ✔ To offer self-employment opportunities in the production of jute products
- ✔ To provide training programme about the eco-friendly nature of jute products
- ✔ To develop jute products by imparting entrepreneurship skills
- ✔ To encourage the production of innovative products from jute

Scope:

Jute is used in the manufacture of fabrics, such as Hessian cloth, sacking, scrim, carpet backing cloth (CBC), and canvas. Hessian is lighter than sacking, and it is used for bags, wrappers, wall-coverings, upholstery, and home furnishings. Sacking, which is a fabric made of heavy jute fibre, has its use in the name.

Vision of the project :

- Have enhanced awareness and improved skills
- Improving income
- Be able to increase marketing ability of product
- Through which women can able to get empowerment
- To enhance self sustainability
- To promote students enterprise through entrepreneurs

Course Tutor: Dr. Radhika Devi, Director i/c
Women's Studies Centre

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SKILL DEVELOPMENT COURSE

HOME GARDEN PROMOTION

Objectives of the programme

- To create the eco-friendly life style
- To ensure the nutritional security of the family
- To minimize the waste through segregation and recycling
- To promote sustainable farming system in available space

COURSE CONTENT

Introduction to Home Garden – Need for home garden, Place selection criteria for gardening, Materials required to install home garden, SWOT in terrace gardening

Cultivation practices – Composition of pot mix to grow vegetables, herbals and flowers, Annual calendar to get year around vegetable harvesting, nutritional requirement of various crops, irrigation management. Pest and disease management.

Allied component of home gardening – Mushroom cultivation, Apiculture, Poultry, Fishery

Yield Maximization tips – Organic manure from kitchen, Composition of various organic health drinks, Tips to harvest optimum yield

Course Tutor: Dr. S. Kannan, Head & Chairperson
Department of Environmental Studies

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SKILL DEVELOPMENT COURSE

Floriculture/Flower Design

Course Objective:

- ✔ The training programme aims to train college students, floriculture business aspirants, floriculture industries and public in understanding the fundamental concepts of floriculture
- ✔ To gain knowledge about the various techniques in floral arrangements
- ✔ To Increase the income of the trainee with minimal investments

Scope:

This training programme is applicable to all colleges, university Departments, floriculture business aspirants, youth and floriculture Industries.

Opportunities:

- Flower farms and nurseries
- Florist shops and floral design studios
- Event management companies
- Horticultural research institutions
- Government departments and agencies related to agriculture and Horticulture
- Landscape design and maintenance companies

COURSE CONTENT
Introduction to Floriculture
Fundamentals of Floral; Arrangement
Flower Decoration
Landscaping & Indoor Gardening

Course Tutor: Dr. S. Kannan, Head & Chairperson
Department of Environmental Studies

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SKILL DEVELOPMENT COURSE

PARAIYATTAM

Objectives of the programme

- The primary objectives of the skill-based course
- To revitalize and skill development opportunities for aspiring various department students for the MKU
- To create awareness about the cultural significance of paraiyattam
- To promote the inclusion of paraiyattam in culture events and festivel

Scope of the course:

The skill-based course on Paraiyattam will encompass the following key components:

- Parai Drumming: Training in playing the parai drum with precision and rhythm
- Dance Movements: Learning traditional dance steps and movements associated with Paraiyattam.
- History and Culture: Understanding the historical and cultural context of Paraiyattam
- Costume and Makeup: Instruction on traditional costumes and makeup used in performances.
- Performance Practice: Regular rehearsals and opportunities to perform in public

Course Tutor: Dr. T.Gobinath, Professor and Head, Department of Folklore and Culture Studies

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Entrepreneurial, Innovation, Skill and Career Hub

SKILL DEVELOPMENT COURSE
In Collaboration with Agro Food Trade Centre

Grain processing

Total hours:30 hrs

Qualification: UG & PG Science Graduate & Students.

Course Objectives:

- Grain Refraction analysis –Physical quality
- Pre Processing
- Solar tunnel Drying- grains, spices, Greens
- Raw and Parboiled milling,, hand bound rice, Broken separation, Polish %, Milling yield calculation.
- Various methods of parboiling
- Sampling and sample preparation for analysis

Career Opportunities

- Storage organizations like TNCSC, CWC,
- TN Ware House corporation private storage organization,
- Food processing Industries
- Food testing lab

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SKILL DEVELOPMENT COURSE
In Collaboration with Agro Food Trade Centre

Nutritional Analysis of Food Products

Total hours:30 hrs

Qualification: UG & PG Science Graduate & Students.

Course Objectives

- ✔ Sampling and sample preparation for analysis
- ✔ Moisture estimation by Moisture meter, Infra red moisture meter, Hot air oven method
- ✔ Protein estimation by Kjeldal digestion and distillation method
- ✔ Fat analysis by soxhlet apparatus method
- ✔ Ash and Acis insoluble ash analysis
- ✔ Crude fibre estimation
- ✔ Carbhohydrate estimation
- ✔ Energy estimation

Career Opportunities

- ❖ Storage organizations like TNCSC, CWC,
- ❖ TN Ware House corporation private storage organization,
- ❖ Food processing Industries
- ❖ Food testing lab

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SKILL DEVELOPMENT COURSE
In Collaboration with Agro Food Trade Centre

Quality analysis of Edible Oil

Total hours:30 hrs

Qualification: UG & PG Science Graduate & Students.

Course Objectives:

- Acid Value (FFA)
- Peroxide value
- Un saponiable matter and Saponification Value
- Butyro Refractometer Reading
- Bellier Turbidity Temperature
- Iodine Value
- Halphens Test (test for presence of Cottonseed Oil)
- Test for presence of Castor Oil

Career Opportunities

- Storage organizations like TNCSC, CWC,
- TN Ware House corporation private storag organization,
- Food processing Industries
- Food testing lab

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SKILL DEVELOPMENT COURSE
In Collaboration with Agro Food Trade Centre

Quality Analysis of Spices & Condiments

Total hours:30
Qualification: UG & PG Science Graduate & Students.

Course Objectives:

- Physical analysis - Extraneous Matter/Foreign Matter, Damaged/Discoloured Fruits, Insect Damaged, Other edible seeds
- Estimation of Moisture
- Total Ash and Acid insoluble ash
- content estimation
- Non-volatile ether extract estimation
- Volatile oil estimation
- Crude fibre

Career Opportunities

- ❖ Storage organizations like TNCSC, CWC,
- ❖ TN Ware House corporation private
- ❖ storage organization,
- ❖ Food processing Industries
- ❖ Food testing lab

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SKILL DEVELOPMENT COURSE

In Collaboration with Agro Food Trade Centre

Quality Analysis of Jaggery and Sugar Products

Total hours:30 hrs

Qualification: **UG & PG Science Graduate & Students.**

Course objectives:

- Moisture
- Extraneous Matter insoluble in water
- Total Ash
- Ash Insoluble in Acid
- Total Sugars

Career Opportunities

- Storage organizations like TNCSC, CWC,
- TN Ware House corporation private storag organization,
- Food processing Industries
- Food testing lab

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SKILL DEVELOPMENT COURSE

PUBLIC FINANCIAL MANAGEMENT SYSTEM – PFMS

Session Includes the hands-on training for the users at different levels.

COURSE CONTENT
Data Administrator
Data Operator
Vendor management
Expenditure management
Data Approver
Reports

For Faculty Members, Administrative Staffs and Students of MKU,DDE & MKU College

Course Tutor: Mr. Manikandan, RUSA Trainer

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SKILL DEVELOPMENT COURSE

USAGE OF GEM PORTAL

Main objectives of GeM Portal

- The main aim of introducing GeM portal is to enhance transparency, efficiency speed in public procurement.
- To increase efficiency, transparency and speed in public procurement.
- One-stop shop for bids / reverse auction on products / services.
- To enable efficient price discovery; economies of scale and dissemination of best practices.

Session Includes

- Introduction to GeM
- GFR (General Financial Rules)-Relevant to GeM
- Procurement Methods in GeM
- Complete demonstration(Slide based of the user creation till the procurement processes)
- New Features in GeM

Course Tutor: Mrs. Brindha Devi, RUSA Trainer

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SKILL DEVELOPMENT COURSE

Entrepreneurship in Food Quality Management

Total hours: 20 hrs

Course objectives:

The scope of a short-term course on Entrepreneurship in Food Quality Management can be quite broad and encompass various aspects related to starting and running a food processing business. The primary objective of such a course would be to equip aspiring entrepreneurs with the knowledge and skills necessary to establish and manage a successful food processing venture.

Key Areas

- Introduction to Food Industry
- Market Analysis
- Food Safety and Quality
- Product Development
- Business Plan Development
- Legal and Regulatory Requirements
- Supply Chain Management
- Marketing and Branding
- Financial Management
- Packaging and Labelling
- Distribution and Sales
- Entrepreneurial Skills
- Case Studies and Industry Insights

Course Tutor: Dr. S. Sugasri, Centre for Tourism and Hotel Management

Syllabus:

Unit 1	Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrap reneur, Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth; Women entrepreneurship: Role and importance, problems
Unit II:	Principles of Management , importance. Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business – identifying, selecting a Good Business opportunity, Market Survey and Research, Techno Economic Feasibility Assessment
Unit III:	Definition- asepsis, preservation, additives. Methods of food preservation / Maintenance of anaerobic conditions Heat processing / pasteurization aseptic packaging / high pressure processing / pascalization
Unit IV:	Food Quality analysis, Canning procedure / methods Heat resistance of micro-organisms important in canning/heat Resistance of enzymes in food/processing by heat.
Unit V:	Definition – food safety management, food laws, Food Adulteration, Food Preservation, Adulterants, Food Additives. Types of common food adulterants test to detect food adulteration. Laws to prevent. Food Standards. Principles of food preservation,

MADURAI KAMARAJ UNIVERSITY

RASHTRIYA UCHCHATAR SHIKSHA ABHIYAN (RUSA)
(National Higher Education Mission)
Entrepreneurial, Innovation, Skill and Career Hub

SKILL DEVELOPMENT COURSE

Entrepreneurship in Food Industry

Total Hours: 20 hrs

Scope of the course:

The scope of a short-term course on Entrepreneurship Development in Food Industry can be quite broad and encompass various aspects related to starting and running a food processing business. The primary objective of such a course would be to equip aspiring entrepreneurs with the knowledge and skills necessary to establish and manage a successful food processing venture.

Key Areas

- Introduction to Food Industry
- Market Analysis
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- Entrepreneurial Skills
- Case Studies and Industry Insights

Course Tutor:
Dr. S. Praveen Kumar, Centre for Tourism and Hotel Management

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SKILL DEVELOPMENT COURSE

FOOD QUALITY TESTING

COURSE CONTENT
Introduction to food and food analysis
Determination of common adulterants in milk
Determination of common adulterants in milk
Determination of adulterants in honey
Determination of adulterants in turmeric
Determination of adulterants in chilli powder
Determination of adulterants in pepper
Determination of adulterants in coffee powder
Determination of adulterants in jaggery
Determination of adulterants in Fish and meat
Determination of adulterants in Saffron
Calorimetric procedure for the detection of food adulterants
Simply do it yourself Home test for Food adulterants
Detection of E.Coli in Idly/Dosa Batter
Detection of Choliform in Drinking Water
Detection of Fungi/Mold in Bread

Major Skills Focused

- Food Testing Laboratory Management Skill
- Safe handling procedure in food industry
- Hands on training in
  - ✔ Food microbiology
  - ✔ Food Chemistry
  - ✔ Food Quality Management

Course Tutor: Dr. M. Jayalakshmi, Associate Professor and Head, Department of Immunology

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SKILL DEVELOPMENT COURSES

CLOUD COMPUTING

Course Objectives:

- To learn how to use cloud services
- To implement cloud service provider resources
- To implement virtualization using cloud service provider Accounts
- Explore AWS, Azure, Google Cloud Platform(GCP) services for networking, compute, storage, databases and monitoring.
- Learn the process of designing optimal IT solutions using the cloud services based on real-life scenarios.

Job Opportunities

- Cloud Engineer
- Cloud Architect
- Cloud Practitioner
- Cloud Administrator
- Cloud Developer

Cloud based Companies

- ✔ Drop box
- ✔ IBM
- ✔ Amazon
- ✔ Google
- ✔ Microsoft

Course Tutor: Mrs. Manilakshmi A, RUSA Trainer

COURSE CONTENT

TOPICS	CONTENT
Introduction to Cloud Computing & AMAZON EC2,EBS,EFS,FSX	Cloud Computing introduction-Deployment and Service Model-AWS Suite-Virtualization in AWS-AWS vs Azure Vs GCP- Xen Hypervisor-Aws Account Creation-Steps-Introduction to EC2Regions and Availability Zones-EC2 Instance Types-What is an AMI-Introduction to EBS-Introduction to EFS-AWS FSx
Introduction To IAM ,Cloud Watch & Elastic Load Balancer	Introduction to IAM-IAM Features and MFA-IAM Policies-IAM Permissions and Roles- Introduction to Cloud Watch -AWS STS-Metrics and Namespaces-Dashboard and Cloud Watch Alarms-Introduction to Elastic Balancer-Types of ELB: Classic, Network, Application and Gateway- Route 53
Virtual Private Cloud (VPC) & AWS Lambda and Beanstalk ,Organizations & Migration	Introduction to VPC-Components of VPC-Security in VPC-Subnets-VPC Peering-VPC Endpoints-Cloud Formation Basics & AWS Lambda, Elastic Beanstalk-AWS Organizations & Migration
Introduction to Microsoft Azure & Networking	Introduction to Microsoft Azure and ARM- Resource Groups-Azure Storage Accounts-Azure Blobs-Azure Virtual Machines-Backups and Lifecycle Management Policies-Azure VNet- VNet Peering-Azure Subnets and DNS-Network Security Groups-Azure Service Tags
Azure Load Balancer ,Active Directory & Monitoring	Azure Load Balancer and It' s Types-Application &VPN Gateway-Azure Site-to-Site Connection-Azure Express Route-Access Management-Windows AD vs Azure AD-Azure Metrics-Azure log Analytics-Azure Kubernetes Service
Google Cloud Platform(GCP)	Introduction to GCP-Cloud VPN-Cloud IAM-Service Account-Compute Engine- GCP Storage-Spanner, Big table, data store & Cloud Deployment- Bigdata, BigQuery, Cloud DataProc-Cloud Data Prep by Trifacta- AutoML-Cloud Deployment Manager-Endpoints

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SKILL DEVELOPMENT COURSES

C++

Course Content:

- ✔ Intro
- ✔ Keywords
- ✔ Variables
- ✔ Data types
- ✔ Operators
- ✔ Expressions
- ✔ Functions
- ✔ if...else statement
- ✔ Loop statements

Mode : Both offline and online

Duration : 40 hours

Highlights : Materials will be provided in soft copy format

Course Tutor: Dr. Rathinasapabathy, Assistant Professor, Department of Computer Applications

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SKILL DEVELOPMENT COURSE

Data Analysis Using Python

Course Objectives:

This course is designed to teach students how to analyze different types of data using Python. Students will learn how to prepare data for analysis, perform simple statistical analysis, create meaningful data visualizations and predict future trends from data.

Course Outcomes:

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

1. Understanding basics of python for performing data analysis
2. 2. Understanding the data, performing preprocessing, processing and data visualization to get insights from data.
3. Use different python packages for mathematical, scientific applications and for web data analysis.
4. Develop the model for data analysis and evaluate the model performance.

Course Tutor: Dr. Rathinasapabathy, Assistant Professor, Department of Computer Applications