THE COCHIN COLLEGE

Koovapadam, Kochi-2

Affiliated To Mahatma Gandhi University
Re-accredited by NAAC With B+ Grade

Fourth Cycle
NAAC Accreditation 2024

Criterion 1
Curricular Aspects

1.2 - Academic Flexibility

Metric No. 1.2.1

Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc.

Brochure and Syllabus- 2021-2022

Submitted to

National Assessment and Accreditation Council

Digitally signed by
Mrudula Menon V.
Principal-in-charge
The Cochin College, Kochi-2

Phone: 0484 2224954, 2226449

THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

THE COCHIN COLLEGE Cochin-2

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Phone: 0484 2224954, 2226449

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B.A. English Language and Literature

Add on Course 2021-22

Mass Communication

Syllabus

POC: Mass Communication is a broad discipline in the field of Journalism that covers various subjects such as Aesthetics and Visual Communication, Photography, Print Media, Electronic Media, and Broadcasting. Journalism, Advertising, and Print Media.

CO1: To understand the basic concepts of communication and its types

CO2: To apprise students the history and growth E Media in India, also to make them aware of impact of TV and radio in society.

Module I

Introduction to Mass Communication

- Principles of Communication
- Types of Communication
- Functions of Mass Communication
- Barriers, Intertextuality.

Module II

Print Journalism

- Fundamentals of Journalism
- Fashion Magazines
- Women Magazines
- Current affairs Magazines
- Travel and Life style Magazines

Module III

Radio Journalism

- Radio Production
- Voice Recording
- Dubbing

Module IV

Television Journalism

- Television News

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Entertainment Programmes

Reality Shows

Sitcoms

Module V

Cyber Journalism

Blogging

Social Networking Site

Trolls

Memes

References

1. Mass Communication in India – By Keval J. Kumar, 1994

2. Mass Communication Theory: Foundations, Ferment and Future – By Stanley J. Baran and Dennis K. Devis, 2015.

3. Introduction to Communication Studies – By John Fiske, 2010.

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ADD ON COURSE - ENGLISH – DIGITAL HUMANITIES
This course is designed to introduce students to the evolution and fundamental concepts of Digital Humanities, by examining the intersection of technology and humanities. It is intended to help learners appreciate the value of theories and practices of humanities in the digital space, in both academic and non-academic contexts. This course introduces the potential for curating/creating a piece of digital scholarship. The students are also encouraged to develop a sense of critical thinking and to acquire the analytic and practical skills necessary to understand and apply computing to the source materials and problems of the humanities.

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome
CO1	Develop an ability to construct meaning and acquire a humanist insight while inquiring into big data
CO2	Acquiring basic knowledge and appreciation of technology in culture and society
CO3	Understanding how new technologies are transforming historical teaching, research, writing and publishing.
CO4	Learning to use digital tools and methods to study and promote Humanities
CO5	Analyse the scope of Digital Humanities beyond the academic field
CO6	Get introduced to the concept of Digital Humanities in Indian Context.

COURSE CONTENT

Module	Course description
1	**Foundations of Digital Humanities**
1.1	Introduction to Digital Humanities – Defining DH
1.2	Historical Context and Significance – Digital pedagogy
1.3	Introduction to Text Analysis - Textual Analysis and Digital Texts

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1.4	Required Reading – The concept of "Distant Reading" introduced by Franco Moretti
2	**Visualization and Data**
2.1	Data Visualization in Humanities
2.2	Principles of Data Visualization – Tools for Data Visualization
2.3	Digital Archives and Libraries
2.4	Required Reading – "Working with Knowledge" – Peter Horsman
3	**Textual Encoding and Spatial Analysis**
3.1	Textual Encoding and Mark-up Languages
3.2	Introduction to TEI – Mark-up Languages XML, HTML
3.3	Spatial Humanities and GIS – Geospatial Analysis in Humanities
3.4	GIS for Humanities Research –Mapping Historical Data with GIS
4	**DH in India**
4.1	Internet and Indian Women's Poetry in English
4.2	Indian Graphic Novel – Indian video games
4.3	DH in Indian classrooms
4.4	Digital Library of India
5	**Social Media, Collaboration and Future Trends**
5.1	Social Media and Digital Culture

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5.2	Required Reading: "The Age of Social Media: A Cultural Perspective" – Jean Burgess
5.3	Collaborative Tools and Project Management – Case Studies of successful Projects
5.4	Required Reading – "Project Management in the Digital Humanities" – Brett D. Hirsch

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Direct Instruction Brainstorming Lectures e-learning Interactive instruction Seminars Library Work Group Discussions
Assessment Types	**MODE OF ASSESSMENT** A. Continuous Comprehensive Assessment (CCA) B. Internal Test – extended answer type C. Mini Project Work – Presentation of the project using ICT D. End Semester Examination

SUGGESTED READINGS

Adolphs, Svenja and Dawn Knight, editors. *The Routledge Handbook of English Language and Digital Humanities*. Routledge, 2020.

Battershill, Claire and Shawna Ross. *Using Digital Humanities in the Classroom*. Bloomsbury Academic, 2022.

Berry, David M. *Understanding Digital Humanities*. Palgrave Macmillan, 2012.

Bulkun, Mestrovic Deyrup and Mary. *Transformative Digital Humanities: Challenges and Opportunities*. Routledge, 2020.

Crompton, Constance, Richard J. Lane, and Ray Siemens, editors. *Doing Digital Humanities: Practice, Training, Research*. Taylor & Francis,

Mrudula Menon V.
Principal-in-Charge
The Cochin College

2016.

Dobson, James E. *Critical Digital Humanities: The Search for a Methodology*. University Illinois of Press, 2019.

Dodd, Maya & Nidhi Kalra. *Exploring Digital Humanities in India*. Routledge, 2021.

Fiormonte, Domenico, Sukanta Chaudhuri, and Paola Ricaurte editors. *Global Debates in the Digital Humanities*. University of Minnesota Press, 2022.

Gold, Matthew, editor. *Debates in the Digital Humanities*. University of Minnesota Press, 2012.

Dodd, Maya and Nidhi Karla. *Exploring Digital Humanities in India Pedagogies, Practices, and Institutional Possibilities*. Routledge India, 2020.

Kung, Kaby Wing-Sze. *Reconceptualizing the Digital Humanities in Asia.* Springer, 2020.

Levenberg, Lewis, Tai Neilson and David Rheams editors. *Research Methods for the Digital Humanities*. Palgrave Macmillan, 2018.

Risam, Roopika. *Postcolonial Digital Humanities in Theory, Praxis and Pedagogy*. North Western University Press, 2018.

Rosenzweig, Roy and Dan Cohen. Digital History: *A Guide to Gathering, Preserving, and Presenting the Past on the Web*. University of Pennsylvania Press, 2005.

Sabharwal, Arjun. *Digital Curation in the Digital Humanities: Preserving and Promoting Archival and Special Collections*. Chandos Publishing, 2015.

Schnapp, Jeffrey. *Digital Humanities*. MIT Press, 2021.

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Add on Course- English Language Teaching (ELT)

Course Duration: 30 Hours

Course Objectives:
1. To introduce students to the fundamental concepts and methodologies of English Language Teaching (ELT).
2. To enhance understanding of language acquisition theories and their application in ELT.

Course Outcomes:
By the end of this course, students will be able to:
1.Demonstrate knowledge of key ELT theories and methodologies.
2. Apply language acquisition theories to classroom teaching.

Module 1: Introduction to ELT
Duration: 6 Hours
- Overview of ELT: History and Development
- Key Concepts and Terminology
- Roles and Responsibilities of an ELT Teacher

Module 2: Theories of Language Acquisition
Duration: 6 Hours
- Behaviorist Theory
- Innatist Theory
- Interactionist Theory
- Sociocultural Theory
- Implications for ELT

Module 3: Teaching Methodologies and Approaches
Duration: 6 Hours
- Grammar-Translation Method
- Direct Method
- Audio-Lingual Method
- Communicative Language Teaching (CLT)
- Task-Based Language Teaching (TBLT)

Module 4: Integrating Literature in ELT
Duration: 6 Hours
- Benefits of Using Literature in ELT
- Criteria for Selecting Literary Texts
- Approaches to Teaching Literature in ELT
- Designing Literature-based Language Activities

Module 5: Practical Teaching Skills
Duration: 6 Hours
- Classroom Management Strategies
- Student Engagement Techniques
- Assessing Language Skills
- Providing Constructive Feedback

Designing assessment tools
Participation in class activities and discussions

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Recommended Reading:

Harmer, J. (2007). The Practice of English Language Teaching. Pearson Longman.
Richards, J.C., & Rodgers, T.S. (2014). Approaches and Methods in Language Teaching. Cambridge University Press.
Brown, H.D. (2007). Principles of Language Learning and Teaching. Pearson Education.
Lazar, G. (1993). Literature and Language Teaching: A Guide for Teachers and Trainers. Cambridge University Press.
This syllabus is designed to provide a comprehensive and practical introduction to English Language Teaching for literature students, equipping them with the knowledge and skills necessary to excel in the field of ELT.

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English Language Teaching (ELT)

Total Marks: 50

Answer all questions.

Section A: Short Answer Questions (2 Marks each)

Answer all questions. Each question should be answered in about 30-50 words.

1.Define the term "Communicative Language Teaching (CLT)".

2.Briefly explain the behaviorist theory of language acquisition.

3.List two roles of an English language teacher.

4.Mention two benefits of using literature in English language teaching.

5.What is the Grammar-Translation Method?

Section B: Medium Answer Questions (5 Marks each)

6. Compare the Audio-Lingual Method and the Direct Method in ELT.

7. Discuss the implications of the sociocultural theory for English language teaching.

8. Describe the criteria for selecting appropriate literary texts for ELT.

9. Explain three classroom management strategies that can be used in an ELT classroom.

10. How can constructive feedback be provided effectively to English language learners?

Section C: Long Answer Questions (15 Marks each.)Answer any two questions.

11.. Design a lesson plan using the Task-Based Language Teaching (TBLT) approach for a 45-minute class. Include objectives, materials, activities, and assessment methods.

12. Critically analyze the role of literature in enhancing language learning, providing examples of how specific literary works can be used in the classroom.

Mrudula Menon V.
Principal-in-Charge
The Cochin College

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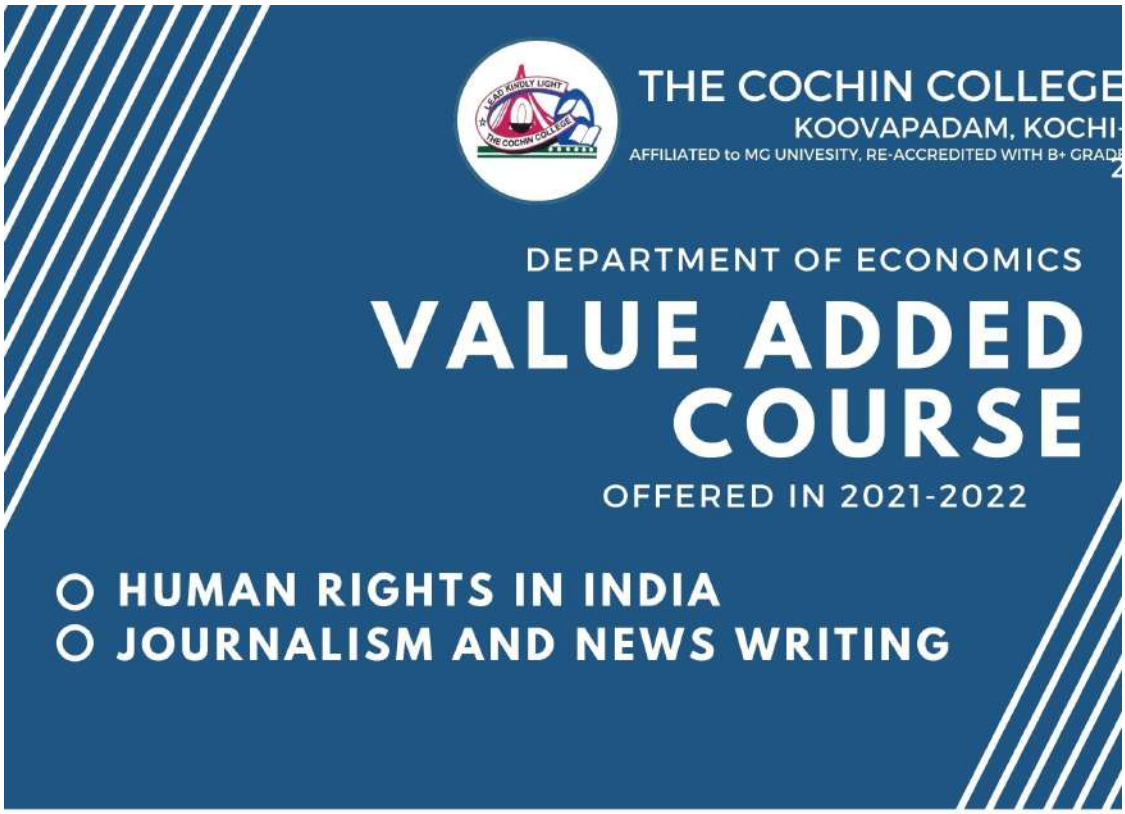
Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in



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Mrudula Menon V.
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The Cochin College

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email: email@thecochincollege.edu.in

DEPARTMENT OF ECONOMICS

ADD ON COURSE 2021-22

Course Title	**Human Rights in India (30 Hours)**
Course Summary	This is designed to provide students with a comprehensive understanding of the concept of human rights, their historical development, and their current status in India. The course covers key human rights issues, legal frameworks, and the role of various stakeholders in the protection and promotion of human rights in the country.
Course outcome	1. understand the concept and evolution of human rights. 2. gain knowledge of the Indian constitutional and legal framework for human rights. 3. explore contemporary human rights issues in India. 4. learn about the role of national and international human rights organizations. 5. develop skills for advocating and protecting human rights.

Module	Content	Hrs
I	**Module 1: Introduction to Human Rights**	5
	Definition and Concept of Human Rights Historical Development of Human Rights Universal Declaration of Human Rights (UDHR) International Human Rights Treaties and Conventions	

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	Principles of Equality, Dignity, and Non-discrimination	
II	**Module 2 : Indian Constitutional and Legal Framework**	5
	Fundamental Rights in the Indian Constitution Directive Principles of State Policy Important Human Rights Legislation in India Role of the Judiciary in Protecting Human Rights Public Interest Litigation (PIL) and Human Rights	
III	**Module 3: Key Human Rights Issues in India**	5
	Rights of Women and Children Rights of Scheduled Castes and Scheduled Tribes Rights of Minorities Rights of Persons with Disabilities Issues of Caste Discrimination and Social Exclusion	
IV	**Module 4: Human Rights and Law Enforcement**	5
	Role of Police and Law Enforcement Agencies Human Rights Violations and Abuse of Power Torture, Custodial Deaths, and Extra-judicial Killings Legal Safeguards and Mechanisms for Redressal Case Studies and Judicial Pronouncements	

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V	**Module 5: Role of National and International Organizations**	5
	National Human Rights Commission (NHRC) and State Human Rights Commissions Role of Non-Governmental Organizations (NGOs) United Nations Human Rights Council (UNHRC) International Non-Governmental Organizations (INGOs) Collaboration between National and International Bodies	
VI	**Module 6: Advocacy and Promotion of Human Rights**	5
	Human Rights Education and Awareness Strategies for Human Rights Advocacy Role of Media in Promoting Human Rights Community Mobilization and Grassroots Initiatives Challenges and Future Directions in Human Rights Protection	
	Assessment Class Participation and Attendance (10%) Quizzes and Assignments (30%) Case Study Analysis and Presentations (30%) Final Examination (30%)	

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Mrudula Menon V.
Principal-in-Charge
The Cochin College

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email: email@thecochincollege.edu.in

DEPARTMENT OF ECONOMICS
ADD ON COURSE 2021-22

Course Title	**Journalism and News Writing (30 Hours)**
Course Summary	This course is designed to provide students with essential skills and knowledge in journalism, including news gathering, writing, and reporting. The course covers the fundamentals of journalism, ethical considerations, and the practical aspects of producing news stories.
Course outcome	1. understand the principles and ethics of journalism. 2. develop skills for gathering, verifying, and writing news stories. 3. learn about different types of journalistic writing and reporting. 4. gain proficiency in using digital tools and platforms for news writing. 5. understand the role of journalism in society.

Module	Content	Hrs
I	**Module 1: Introduction to Journalism**	5
	Definition and Role of Journalism History and Evolution of Journalism Types of Journalism: Print, Broadcast, and Digital Principles of Journalism: Accuracy, Fairness, and Objectivity The Role of Journalists in Society	
II	**Module 2 : News Gathering and Reporting**	5
	Sources of News: Primary and Secondary Techniques for Gathering Information	

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	Conducting Interviews Verifying Facts and Sources Ethical Considerations in News Gathering	
III	**Module 3: News Writing**	5
	Structure of a News Story: Headline, Lead, Body, Conclusion Writing Clear and Concise Leads Inverted Pyramid Style of Writing Writing for Different Media: Print, Broadcast, Online Editing and Proofreading Techniques	
IV	**Module 4:Feature Writing and Other Forms of Journalism**	5
	Difference Between News and Features Writing Human Interest Stories Investigative Journalism Opinion Writing and Editorials Review Writing: Books, Films, and Events	

V	**Module 5: Digital Journalism**	5
	Digital Tools and Platforms for Journalists Blogging and Microblogging Using Social Media for News Reporting Multimedia Journalism: Video, Audio, Infographics	

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	Challenges and Opportunities in Digital Journalism	
VI	**Module 6: Ethics and Legal Issues in Journalism**	5
	Code of Ethics for Journalists Understanding Media Laws and Regulations Defamation, Libel, and Slander Privacy Issues and Public Interest Case Studies of Ethical Dilemmas in Journalism	
	Assessment Class Participation and Attendance (10%) Quizzes and Assignments (30%) Case Study Analysis and Presentations (30%) Final Examination (30%)	

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Brochure & Syllabus

Certificate/Value added courses offered during 2021-22

Mrudula Menon V.
Principal-in-Charge
The Cochin College

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email: email@thecochincollege.edu.in

VALUE ADDED COURSE

Department of Computer Application, The Cochin College.

ADBCA2109 : AWS AND DATA SCIENCE

Duration: 30 Hours

Course Description:

This course covers the fundamentals of data science and its applications on Amazon Web Services (AWS). Students will learn how to collect, store, process, and analyze data using various AWS services, including S3, Glue, Lake Formation, and Sage Maker. The course will also cover machine learning and deep learning techniques using AWS services like Sage Maker and Comprehend.

Course Objectives:

- Understand the basics of data science and its applications

- Learn how to use AWS services for data storage, processing, and analysis

- Understand machine learning and deep learning techniques

- Apply data science techniques to real-world problems using AWS services

Course Outline:

Module 1 (6 hours)

- Introduction to Data Science and AWS
- Overview of data science and its application
- Introduction to AWS and its services
- Setting up AWS account and basic services

Module 2 (6 hours)

- Data Storage and Processing on AWS
- Amazon S3: object storage and data lake
- Amazon Glue: data integration and ETL
- Amazon Lake Formation: data warehousing and governance

Module 3 (6 hours)

- Data Analysis and Visualization on AWS
- Amazon Sage Maker: machine learning and deep learning
- Amazon Comprehend: natural language processing
- Data visualization using AWS Quick Sight

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Module 4 (6 hours)

- Machine Learning and Deep Learning on AWS
- Supervised and unsupervised learning
- Neural networks and deep learning
- Model training and deployment on Sage Maker

Module 5 (6 hours)

- Advanced Topics in AWS and Data Science
- Big data and distributed computing on AWS
- Serverless computing and AWS Lambda
- Security and governance on AWS

Assessment of Outcomes:

- Quizzes and assignments (40%)

- Project development and implementation (30%)

- Final exam (30%)

Reference Books

Data Science on AWS: Implementing End-To-End, Continuous AI and Machine Learning Pipelines by Chris Fregly , Antje Barth

Serverless ETL and Analytics with AWS Glue: by Vishal Pathak

AWS Certified Data Analytics Study Guide: by Asif Abbasi

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VALUE ADDED COURSE

Department of Computer Application, The Cochin College.

ADBCA2108 : INTRODUCTION TO IOT

Duration: 30 Hours

Course Description:

This course provides a comprehensive introduction to the Internet of Things (IoT), including its fundamental concepts, technologies, and applications.

Course Objectives:

- Understand the basics of IoT and its ecosystem
- Learn about IoT devices, sensors, and actuators
- Understand communication protocols and networking in IoT
- Explore IoT applications and use cases
- Learn about IoT security and privacy concerns

Course Outline:

Module 1 (6 hours)

- Introduction to IoT
- Definition and overview of IoT
- IoT ecosystem and stakeholder
- IoT applications and use cases

Module 2 (6 hours)

- IoT Devices and Sensors
- Types of IoT devices (microcontrollers, gateways, etc.),
- Sensors and actuators (temperature, humidity, motion, etc.)
- Device communication protocols (HTTP, MQTT, CoAP, etc.)

Module 3 (6 hours)

- IoT Networking and Communication,
- IoT network architectures (star, mesh, cluster, etc.),
- Communication protocols (Wi-Fi, Bluetooth, LoRaWAN, etc.)
- IoT data transmission and processing

Module 4 (6 hours)

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- IoT Applications and Use Cases
- Industrial IoT (IIoT),Consumer IoT (CIoT)
- Smart cities and smart homes
- Healthcare and wearable devices

Module 5 (6 hours)

- IoT security threats and vulnerabilities
- Security measures (encryption, authentication, etc.),
- Privacy concerns and data protection

Assessmentof Outcomes:

- Quizzes and assignments (40%)

- Group project (30%)

- Final exam (30%)

Reference Books

Introduction to IoT by Sudip Misra , Anandarup Mukherjee , Arijit Roy
Introduction to Internet of Things by Jeeva Jose, Vijo Mathew
Introduction to IoT by V. Manjuladevi

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VALUE ADDED COURSE

Department of Computer Application, The Cochin College.

ADBCA2108 : GAMING AND ANIMATION BASICS

Duration:30 hours

Course Description:

This course introduces the fundamental concepts and techniques of gaming and animation, covering the basics of game design, animation principles, and visual storytelling.

Course Objectives:

- Understand the basics of game design and development
- Learn fundamental animation principles and techniques
- Understand visual storytelling and narrative structure
- Apply basic game development and animation tools

Course Outline:

Module 1 (6 hours)

- Introduction to Game Design
- Overview of game development process
- Game design principles and elements
- Game genres and mechanics

Module 2 (6 hours)

- Animation Fundamentals
- Introduction to animation principles (12 basic principles)
- Understanding timing, spacing, and motion
- Basic animation techniques (key frame, tweening, etc.)

Module 3 (6 hours)

- Visual Storytelling and Narrative Structure
- Introduction to visual storytelling
- Understanding narrative structure (three-act structure, etc.)
- Character development and dialogue

Module 4 (6 hours)

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- Game Development Basics
- Introduction to game engines (Unity, Unreal Engine, etc.)
- Basic game development tools (level editors, etc.),
- Understanding game programming basics (variables, loops, etc.)

Module 5 (6 hours)

- Animation Production and Post-Production
- Animation production pipeline
- Understanding editing and sound design
- Final project development and presentation

Assessment of Outcomes:

- Quizzes and assignments (40%)

- Group project (30%)

- Final exam (30%)

Reference Books

Computer Graphics and Animation by Garth Gardner
Guide to Computer Animation by Vijo Mathew
AI For Games and Animation by John David Funge

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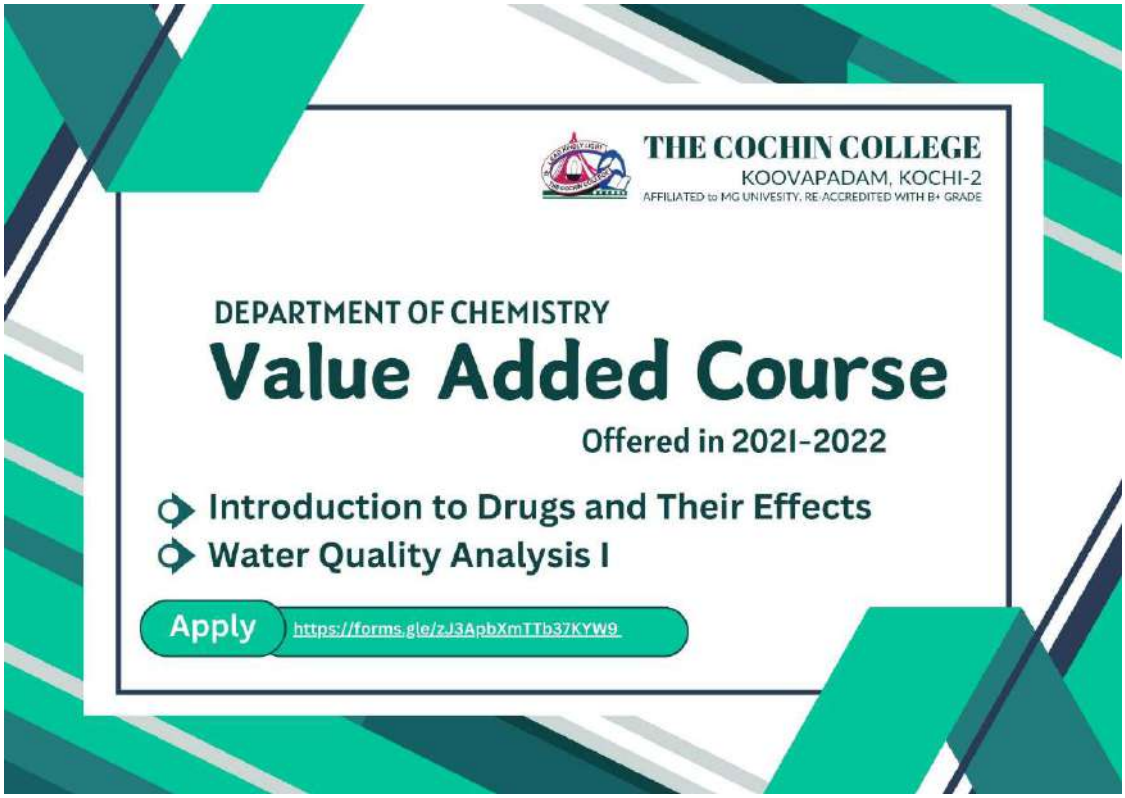

Mrudula Menon V.
Principal-in-Charge
The Cochin College

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email: email@thecochincollege.edu.in

DEPARTMENT OF CHEMISTRY

(Value Added Course Syllabus for UG students)

Course Title: Introduction to Drugs and Their Effects

Course Description

This course provides an in-depth understanding of drugs, including their development, classification, mechanisms of action, therapeutic uses, adverse effects, and the legal and ethical considerations surrounding their use. The course is designed for students pursuing careers in health sciences, pharmacy, medicine, or related fields.

Learning Objectives

By the end of this course, students will be able to:

1. Understand the chemical structure and properties of drugs.
2. Explain the principles of drug design and synthesis.
3. Describe the chemical mechanisms of drug action and metabolism.
4. Analyse the interactions between drugs and biological molecules.
5. Apply chemical knowledge to the development and evaluation of pharmaceuticals.

Course Outline

Module 1: Introduction to Medicinal Chemistry: Definition and scope of medicinal chemistry, Historical development of drugs, Overview of drug discovery and development processes

Module 2: Chemical Structure and Drug Activity: Chemical bonding and molecular structure, Structure-activity relationships (SAR), Functional groups and their role in drug activity.

Module 3: Classification of drugs: Analgesics and anti-inflammatory drugs, Antibiotics and antiviral agents – Ampicillin, Chloramphenicaol, Cardiovascular drugs, Central nervous system (CNS) drugs, Antimalarials- Choroquine, Antacids- Ranitidine, Anti – cancer drugs – Chlorambucil, Anti- HIV agents- Azidothymidine, Antifertility drugs and Psychotropic drugs- Tranquilizers, Antidepressants and stimulants.

Module 4: Therapeutic uses and mode of action of drugs: Antibiotics: Ampicillin and Chloramphenicol, Sulpha drugs: Sulphanilamide, Antipyretics: Paracetamol, Analgesics: Aspirin and Ibuprofen, Antimalarial drug: Chloroquine, Antacids: Ranitidine. Anticancer drugs: Chlorambucil and Anti-HIV agents: Azidothymidine. Chemical toxicology of drugs and environmental contaminants.

Module 5: Drug addiction and Abuse: Drug addiction and its causes, Drug abuse, Effect on brain, Effect on society, Rehabilitation, Prevention and Treatment, Drug Problems.

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Principal-in-Charge
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Assessments

- Weekly quizzes to assess understanding of key concepts
- Final exam covering all course material

Recommended Textbooks and Resources

- "Foye's Principles of Medicinal Chemistry" by David A. Williams and Thomas L. Lemke
- "An Introduction to Medicinal Chemistry" by Graham L. Patrick
- "Burger's Medicinal Chemistry and Drug Discovery" by Donald J. Abraham
- Jain, M.K.& Sharma, S.G Modern Organic Chemistry, Vishal Publishing Co. 2010.

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Department of Chemistry

(Value Added Course Syllabus for UG students)

2021-22

Water Quality Analysis – I

Course Outcomes

1. Describe the principles and methods used for the analysis of physicochemical, chemical, and microbiological parameters in water.
2. Interpret water quality data and assess the health and environmental implications of different water quality parameters.
3. Apply national and international water quality standards and guidelines to assess and manage water quality.
4. Demonstrate proficiency in laboratory techniques used for water quality analysis, including sampling, preservation, and analytical methods.
5. Critically evaluate water quality issues and propose appropriate management strategies based on scientific evidence.

Course Outline

Instructional Hours: 30 Hrs

Module 1: Introduction to Water Quality

Introduction to Water Quality Analysis Definition and importance of water quality, Parameters of interest in water quality analysis **Water Quality Standards and Regulations** Overview of national and international water quality standards (e.g., WHO, EPA) Regulatory frameworks and guidelines **Sampling and Sample Preservation** Importance of representative sampling, Techniques for sample collection and preservation

Module 2: Physicochemical Parameters

pH and Conductivity Principles and measurement techniques, Significance in water quality assessment. **Dissolved Oxygen (DO)** Methods of measurement (Winkler method, electronic methods) Biological and chemical significance **Turbidity and Total Suspended Solids (TSS)** Measurement techniques (nephelometric, gravimetric), Sources and impacts on water quality **Nutrients (Nitrogen and Phosphorus)** Analytical techniques (spectrophotometry, colorimetry) Environmental impacts and management

Module 3: Chemical Parameters

Heavy Metals Sources, toxicity, and regulatory limits

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Organic Compounds Pesticides, pharmaceuticals, and emerging contaminants

Chlorine Residuals Types of chlorine residuals (free, combined) and significance in disinfection

References

- **"Standard Methods for the Examination of Water and Wastewater"**
  - **Authors**: American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF)
  - **Publisher**: APHA Press
  - **Year**: 2017 (23rd Edition)
  - **ISBN**: 978-0875532875

- **"Water Quality: An Introduction"**
  - **Authors**: Claude E. Boyd
  - **Publisher**: Springer
  - **Year**: 2021 (3rd Edition)
  - **ISBN**: 978-3030627734

- **"Environmental Chemistry"**
  - **Authors**: Stanley E. Manahan
  - **Publisher**: CRC Press
  - **Year**: 2017 (10th Edition)
  - **ISBN**: 978-1498776949

- **"Handbook of Water Analysis"**
  - **Editor**: Leo M. L. Nollet
  - **Publisher**: CRC Press
  - **Year**: 2020 (3rd Edition)
  - **ISBN**: 978-1138503597

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Phone: 0484 2224954, 2226449

THE COCHIN COLLEGE

KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

Water Quality Analysis I

Student List (2021-22)

Sl No	Name of Student	Course Enrolled in The College	Add on Couse Code	Title of Add on/Certificate Programme
1	ANJALI K B	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
2	ASWIN V PANICKER	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
3	AVANI K V	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
4	DHANYA KRISHNAN	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
5	KARTHIKA P SOMAN	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
6	KRISHNAPRABHA N G	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
7	MARIA RAINA V R	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
8	MEGHANA P V	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
9	MUHAFIS RAHMAN C K	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
10	NASARUNNISA	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
11	NIKITHA T N	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
12	SALMIYA NOURIN E S	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
13	SHREEHARI J B	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
14	VIDYA BABU	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
15	VYSHNAVI S V	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
16	YADHU P MADHU	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
17	ATHIRA A	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
18	ATHULYA SUDHEESH	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
19	MUHAMMED SAHAL A S	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
20	SALHA K A	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
21	SANDRA SUNU	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
22	SHIRIN IBADI PH	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
23	SWETHA S KAMATH	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
24	VISHAL P V	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
25	AALIA KASIM	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
26	ABHINAV SAJI	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
27	AMRUTHA LAKSHMI N	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
28	DIJO JAMES	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
29	MOHAMMED YASEEN P S	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
30	NESMI N	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
31	ROHITHA R	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
32	SHANTHINI S	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
33	THAMEEZA FATHIMA P.N	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
34	AMRITHESH N G	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
35	ANAGHA UNNI	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
36	ANJITHA C A	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
37	ARJUN VINOD	B Sc Chemistry	ADCHE2106	Water Quality Analysis I

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Mrudula Menon V.
Principal-in-Charge
The Cochin College

Phone: 0484 2224954, 2226449

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KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

38	ATHULYA MOL	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
39	GOWRY K R	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
40	MANU C P	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
41	ADARSH S S	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
42	ADWAITH BHASKAR J	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
43	ALAN T ANAS	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
44	AMRUTHA RAJESH	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
45	ASHNA N N	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
46	JAYADEVAN C M	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
47	SHAHAM.T.C	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
48	SIMNA FATHIMA	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
49	ARJUN BABASAHEB PATIL	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
50	ARYA RAJAN	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
51	DEVI NANDANA K	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
52	DHAYA SANTHOSH	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
53	PRAJITHA J PAI	B Sc Chemistry	ADCHE2106	Water Quality Analysis I
54	PRANNAY P KUMAR	B Sc Chemistry	ADCHE2106	Water Quality Analysis I

B Sc Chemistry Add on Examination 2021-22

Time – 1 hr Max marks – 20

Water Quality Analysis I

1. What is pH and why is it significant in water quality assessment?
2. Explain the principle behind measuring conductivity in water.
3. Describe the Winkler method for measuring dissolved oxygen (DO).
4. Why is dissolved oxygen (DO) important in water quality?
5. Why are pharmaceuticals considered emerging contaminants in water
6. Differentiate between free chlorine and combined chlorine residuals.
7. What is the significance of chlorine residuals in water disinfection?
8. What environmental impacts can excessive nutrients (nitrogen and phosphorus) have on water bodies?
9. List three types of organic compounds that can be contaminants in water.
10. How can pesticides affect water quality and aquatic life?

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Attendance Sheet

Sl.no	Name						
1	ANJALI K B						
2	ASWIN V PANICKER						
3	AVANI K V						
4	DHANYA KRISHNAN						
5	KARTHIKA P SOMAN						
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Brochure & Syllabus
-Certificate/Value added courses offered during 2021-22

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VALUE ADDED COURSE
Department of Zoology, The Cochin College.
ADZOO2105: Wildlife Management
Duration: 30 Hours

Course Outcomes

1. **Understand Key Concepts and Principles of Wildlife Management**
2. **Apply Wildlife Population and Habitat Management Techniques**
3. **Navigate Wildlife Conservation Policies and Legislation**

Module 1: Fundamentals of Wildlife Management (6 hours)

- **Lecture 1:** Introduction to Wildlife Management
  - Definition and scope
  - History and evolution of wildlife management
  - Key principles and objectives
- **Lecture 2:** Ecology and Wildlife Habitats
  - Basic ecological concepts
  - Types of habitats and their characteristics
  - Habitat requirements for different wildlife species
- **Lecture 3:** Biodiversity and Conservation
  - Importance of biodiversity
  - Threats to biodiversity
  - Conservation strategies and practices

Module 2: Wildlife Population Dynamics (6 hours)

- **Lecture 1:** Population Ecology
  - Population growth models
  - Carrying capacity and limiting factors
  - Population dynamics and regulation
- **Lecture 2:** Wildlife Census and Monitoring Techniques
  - Survey methods (transects, quadrats, mark-recapture)
  - Use of technology in wildlife monitoring (camera traps, drones, GIS)
- **Lecture 3:** Population Management
  - Managing overpopulated and endangered species
  - Techniques for population control (translocation, contraception, culling)

Module 3: Wildlife Habitat Management (6 hours)

- **Lecture 1:** Habitat Assessment and Restoration
  - Techniques for assessing habitat quality

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- Principles of habitat restoration and enhancement
- **Lecture 2:** Land Use and Wildlife
  - Impact of agriculture, urbanization, and deforestation on wildlife
  - Mitigating human-wildlife conflicts
- **Lecture 3:** Protected Areas and Reserves
  - Types of protected areas (national parks, wildlife sanctuaries, conservation areas)
  - Management strategies for protected areas

Module 4: Wildlife Policy and Legislation (6 hours)

- **Lecture 1:** International Wildlife Conservation Policies
  - Key international treaties and agreements (CITES, CBD, Ramsar Convention)
  - Role of international organizations in wildlife conservation
- **Lecture 2:** National Wildlife Laws and Regulations
  - Overview of national wildlife protection laws
  - Enforcement and compliance mechanisms
- **Lecture 3:** Community-based Wildlife Management
  - Role of local communities in wildlife conservation
  - Case studies of successful community-based management programs

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Module 5: Practical Wildlife Management Skills (6 hours)

- **Lecture 1:** Field Techniques and Data Collection
  - Tracking and monitoring wildlife
  - Collecting and analyzing field data
- **Lecture 2:** Wildlife Health and Disease Management
  - Common diseases affecting wildlife
  - Disease prevention and control measures
- **Lecture 3:** Case Studies and Practical Applications
  - Analysis of real-world wildlife management cases
  - Group discussions and problem-solving exercises

Course Outcomes

4. **Understand Key Concepts and Principles of Wildlife Management**
   - Demonstrate comprehensive knowledge of wildlife management fundamentals, including ecological principles and biodiversity conservation.
   - Explain the importance of wildlife habitats and the threats they face, along with strategies for habitat management and restoration.
5. **Apply Wildlife Population and Habitat Management Techniques**
   - Utilize various techniques for wildlife population monitoring and management, including census methods and population control strategies.

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- Assess and improve habitat quality through effective management practices and understand the impact of land use on wildlife.

6. **Navigate Wildlife Conservation Policies and Legislation**
   - Understand international and national wildlife conservation policies and their implications for wildlife management.
   - Engage with community-based wildlife management approaches and evaluate their effectiveness through case studies.

Assessment of Outcomes

- **Examinations:** Written tests to assess theoretical understanding and practical application.
- **Practical Assessments:** Hands-on evaluations to demonstrate field techniques and data collection skills.
- **Case Studies:** Analysis and group discussions to develop problem-solving abilities and apply knowledge to real-world scenarios.
- **Assignments and Projects:** Research and presentations on relevant topics to encourage deeper learning and engagement.

Recommended Textbooks and Resources

- "Wildlife Ecology, Conservation, and Management" by John M. Fryxell, Anthony R. E. Sinclair, and Graeme Caughley
- "Essentials of Conservation Biology" by Richard B. Primack
- "Techniques for Wildlife Investigations and Management" by Nova J. Silvy
- Journals: "Journal of Wildlife Management", "Conservation Biology"

Additional Notes

- **Guest Lectures:** Invite experts in wildlife management and conservation to provide insights on specialized topics.
- **Field Trips:** Organize visits to national parks, wildlife reserves, and conservation projects for practical exposure.
- **Workshops:** Conduct workshops on specific skills such as habitat assessment, wildlife tracking, and community engagement.

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VALUE ADDED COURSE
Department of Zoology, The Cochin College.

ADZOO2106: Conservation Biology

Duration: 30 Hours

Course Outcomes

1. **Understand Core Concepts and Challenges in Conservation Biology**
2. **Apply Conservation Techniques and Strategies**
3. **Navigate Conservation Policies and Ethical Consideration**

Module 1: Introduction to Conservation Biology (6 hours)

- **Lecture 1:** Fundamentals of Conservation Biology
  - Definition and scope of conservation biology
  - Historical development and milestones
  - Key principles and goals
- **Lecture 2:** Biodiversity and Its Importance
  - Levels of biodiversity: genetic, species, ecosystem
  - Ecosystem services and their value to humans
  - Current state of global biodiversity
- **Lecture 3:** Threats to Biodiversity
  - Habitat destruction and fragmentation
  - Overexploitation, pollution, invasive species
  - Climate change and its impacts on biodiversity

Module 2: Population Biology and Conservation (6 hours)

- **Lecture 1:** Population Dynamics and Viability
  - Population growth models and life history strategies
  - Concepts of minimum viable population and extinction risk
- **Lecture 2:** Genetic Diversity and Conservation
  - Importance of genetic diversity in populations
  - Inbreeding, genetic drift, and gene flow
  - Conservation genetics and its applications
- **Lecture 3:** Species Recovery and Management
  - Endangered species recovery plans
  - Captive breeding and reintroduction programs
  - Success stories and lessons learned

Module 3: Ecosystem Conservation and Management (6 hours)

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- **Lecture 1:** Ecosystem Function and Health
  - Ecosystem structure and function
  - Indicators of ecosystem health and resilience
- **Lecture 2:** Habitat Restoration and Management
  - Principles of habitat restoration
  - Techniques and case studies in habitat management
- **Lecture 3:** Conservation in Fragmented Landscapes
  - Landscape ecology and connectivity
  - Designing wildlife corridors and buffer zones
  - Managing human-wildlife conflicts

Module 4: Conservation Policy and Ethics (6 hours)

- **Lecture 1:** International Conservation Policies and Agreements
  - Key treaties and conventions (CBD, CITES, Ramsar)
  - Role of international organizations in conservation
- **Lecture 2:** National Conservation Policies and Frameworks
  - Overview of national conservation laws and regulations
  - Protected areas and their management
- **Lecture 3:** Ethical Issues in Conservation
  - Ethical considerations in biodiversity conservation
  - Balancing human needs and conservation goals
  - Case studies in conservation ethics

Module 5: Practical Conservation Strategies (6 hours)

- **Lecture 1:** Conservation Research and Monitoring
  - Methods for assessing biodiversity and ecosystem health
  - Use of technology in conservation research (remote sensing, GIS)
- **Lecture 2:** Community-based Conservation
  - Role of local communities in conservation
  - Strategies for engaging and empowering communities
  - Successful examples of community-based conservation
- **Lecture 3:** Integrated Conservation Approaches
  - Combining in situ and ex situ conservation methods
  - Ecosystem-based management and adaptive management
  - Case studies of integrated conservation projects

Assessment of Outcomes

- **Examinations:** Written tests to assess understanding of theoretical concepts and practical applications.

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- **Practical Assessments:** Fieldwork and data collection to demonstrate proficiency in conservation techniques.
- **Case Studies:** Analysis and group discussions to develop problem-solving abilities and apply knowledge to real-world scenarios.
- **Assignments and Projects:** Research and presentations on relevant topics to encourage deeper learning and engagement.

Recommended Textbooks and Resources

- "Conservation Biology: Foundations, Concepts, Applications" by Fred Van Dyke
- "Principles of Conservation Biology" by Martha J. Groom, Gary K. Meffe, and C. Ronald Carroll
- "Essentials of Conservation Biology" by Richard B. Primack
- Journals: "Conservation Biology", "Biological Conservation"

Additional Notes

- **Guest Lectures:** Invite experts in conservation biology and policy to provide insights on specialized topics.
- **Field Trips:** Organize visits to conservation projects, protected areas, and research centers for practical exposure.
- **Workshops:** Conduct workshops on specific skills such as biodiversity assessment, habitat restoration, and community engagement.

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The Cochin College

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POST GRADUATE AND RESEARCH DEPARTMENT OF COMMERCE

(Add on Course Syllabus for BcomTaxation Students)

Principles and Practice of Insurance

Instructional Hours : 30

Course Objectives

1. To understand of the basic insurance terminology and common insurance policies.
2. To learn about the various dynamics of insurance industry, underwriting process and types of insurance e.g. life insurance, auto insurance etc.
3. To understand insurance as a method to hedge against the risk.

Course Learning Outcomes

After the completion of the course, the learners will be able to:

1. Understand the fundamental concepts of insurance and risk management.
2. Learn the major categories of insurance.
3. Apply the process of risk management in business operation and personal life
4. Relate the elements of an insurance contract in a practical application.
5. Discuss contemporary challenges and ethical issues in insurance industry.

Module I

Introduction to Health Insurance: Definition of Health, Determinants of Health, Factors affecting the health systems in India, Evaluation of health insurance in India, Employees State Insurance Scheme Central Government Health Scheme, Commercial health insurance, Health Insurance Market. Health Insurance Providers, Intermediaries, Insurance selling activities, Insurance Servicing activities, financial product distribution, Other important organizations which from part of the health insurance market.

Module 2

Health Insurance Products: Classification of health insurance product, introduction, Definition, Features of health policies, Broad Classification of health insurance products, IRDA guidelines on standardization in health insurance. Hospitalization indemnity product: Top up covers or high deductible insurance plans, Senior citizen policy, fixed benefit covers, hospital cash, critical illness, hospital daily cash policy, critical illness policy, long term care insurance. Group Health insurance, Underwriting of overseas travel insurance, Underwriting of personal accident insurance. Challenges in health Insurance.

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Module 3

Insurance Problems of educational and religious institutions, hospitals, clubs and associations, Professional package contracts, Errors and omissions insurance, Professional liability insurance, Accountants liability insurance, Limits on amount of insurance, Marketing and underwriting of liability insurance, Finance of liability insurance

Module 4

Nature of losses and their adjustment, Procedure of adjustment, Functions of adjuster's, Responsibilities of adjuster's, Survey of losses, Procedure for preparing claims statements, Documents in use in claim settlement, requirement of the insured in the event of loss. Appointment and loss valuation, statutory control over liability insurance in India. Liability policies by General Insurance Corporation of India.

Module 5

Liability Insurance-Procedure for obtaining liability insurance. Legal position of insurance agent, Construction and issue of policy, Record of liability insurance, Policy conditions, Mandatory Public Liability Insurance; Dwelling property losses: Business interruption and related losses: Theft Insurance contracts, Budgetary covers, Auto Insurance, Medical Benefit Insurance, Personal insurance, Employer's liability, Aviation insurance, Personal and residential insurance, Boiler machinery insurance, Commercial enterprises and industrial property insurance.

Suggested Readings

1. *The Financial Services Fact Book 2013.* New York: Insurance Information Institute, 2013.
2. Graves, Edward E. (Ed.), *McGill's Life Insurance,* 9th ed. Bryn Mawr, PA: The American College, 2013, Chs. 22–23.
3. *The Insurance Fact Book 2015.* New York: Insurance Information Institute, 2015.
4. Lloyd's of London. *Lloyd's Quick Guide, An Introduction to Who We Are and What We Do*. May 2011.
5. *2014 Life Insurers Fact Book.* Washington, DC: American Council of Life Insurers, 2014.
6. LOMA (Life Office Management Association). *Insurance Company Operations*, 3rd ed. Atlanta, GA: ...

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Add on Course for 2021-22

POST GRADUATE AND RESEARCH DEPARTMENT OF COMMERCE

HOSPITALITY MANAGEMENT

Instructional Hours- 30

Objective- To Understand the Essentials of Hospitality Management for Taking up Hospitality Business.

Programme Outcome- Students will gain an understanding about: -

1. Introduction to Hospitality Management
2. Organisation and Function of Hotel Industry
3. Accommodation Marketing
4. Managerial Issues in Hospitality Management
5. Emerging Trends in Hospitality Management

Eligibility: B. Com Marketing

Module I

Concept of Hospitality-Meaning-Definition and Nature of Hospitality- Hospitality in the Cultural Settings of India- Inducting Management in Hospitality Industry Historical Perspective of Hospitality Management- Objectives of Hospitality Management- Prerequisites of Hospitality Management- Hospitality Management in the Indian Scenario.

Module II

Hotel Industry - Concept- Meaning and Scope- Functional Departments of Hotel Industry- Functions of Front Office-Management of Front Office-House-Keeping functions-Nature and Dimensions- Food and Beverages- Managements of Food Services- Restaurant Infrastructure and Management- Food Production Infrastructure- Supporting Services- Purchase- Storage and Sales

Module III

Role of Accommodation in Tourism- Types of Accommodation- Grouping and Categorization of Hotels- Registration Forms of Hotel Ownership- Pricing Strategies of Hotels Price-offs as Sweep Takers in the Competitive Economy- Promotion of Hotel Accommodation- Domestic and Overseas Promotion- Emerging Trends in Promotion of Hotel Accommodation - Public Relation and Hotel Industry.

Module IV

Concept of Managerial Issues Ethical, Cultural and Social Issues- Threats and Challenges of Managing Hotel-Human Resources Management of Hotels Interface between Travel Agencies and Hotelier's- Catering - Types - Railways - Airways - Role of Private and Public Agencies in Catering for Tours

Module V

Changing Scenario of the Hospitality Industry-Ecofriendly Accommodation-Heritage Accommodation - Seasonality and Promoting Domestic Market for Hotel Industry- Multi-Purpose Accommodation- Seminar- Conference- Business Meet- Independent Guest Houses- Private Agencies in Guest House Accommodation- Government and Hotel Industry Fiscal and Non-Fiscal Incentives- Challenges of Hospitality Industry in India

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Suggested Readings:

1. John, R., Warker, Introduction of Hospitality, PHI, New Delhi.
2. Zeithaml, V.A., Service Marketing, McGraw Hill, London
3. Gray & Ligouri, Hotel and Motel Management and Operations, PHI, New Delhi
4. Andrews, Hotel Front Office Training Manual, Tata McGraw Hill, Mumbai
5. Negi, Hotels for Tourism Development, S.Chand, New Delhi.

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Add on Course Syllabus for Academic Year 2021-2022

POST GRADUATE AND RESEARCH DEPARTMENT OF COMMERCE

INDUSTRIAL ECONOMICS

Duration :30 Hours

Objectives of the Course : To provide the students an insight into the basic concepts & analytical tools of economics related to firm/industry/organization. The course involves the understanding of the markets, industrial environment, policies and problems of industrial growth and development.

Course Overview :

- It gives knowledge about over all functions of the market, Cost, Revenue, Demand and Supply of the firms.
- It will help the students to know what determines the rate of growth of an economy, factors causing low or high unemployment and business cycle.
- It gives the students exposure to capital budgeting, risk analysis and decision making.
- It makes the students know the overview of Liberalization, Privatization and Globalization.
- Students are made to understand the importance of fiscal policy for a nation.

Module – 1: INDUCTION TO INDUSTRIALISATION

Meaning of industrialization, features of industrial structure, role of Industrialization in India, factors affecting industrialization in India, Industrialization since independence.

Module - 2: INDUSTRIAL LOCATION

Location, localization and planned location of industries, factors influencing industrial location, advantages and disadvantages of localization, Theories of location: Weber's and Sargent Florence's theory.

Module - 3: INDUSTRIAL GROWTH AND PRODUCTIVITY

Industrial development under plans; Role of public and private sector; Industrial productivity: meaning,definitions, significance and tools of industrial productivity, factors influencing industrial productivity.

Module - 4: INDUSTRIAL FINANCE

Meaning, role need and types of Industrial finance, Internal v/s external, Development FinancialInstitutions: IFCI, SFCs, ICICI, IDBI, SIDBI, IRCI, EXIM Bank etc.

Module - 5: PROBLEMS AND PROSPECT OF SELECTED INDUSTRIES

IT Industries in India: Meaning, major issues, present Status and future Prospects of IT Industries,Contribution of women to IT sector; Problems and prospects of Iron and Steel, Cotton, Textile,Sugar, Cement and Jute industries in India.

References:

Industrial Economics, An Introductory Text Book, R.R. Barthwal; New Age International (P) Limited.

Economics; Samuelson, Nordhaus; Tata Mc Graw Hill, New Delhi.

Industrial Economics, A K Sharma; Anmol Publications.

Industrial Economics: Theory and Evidences, D. Hay and D. J. Morris; Oxford University Press, London

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INTERNATIONAL FINANCE

Duration 30 Hours

Course Overview

This course introduces the principles and practices of international finance, focusing on how financial management is conducted across borders. Students will explore currency markets, international investment, and financial risk management in a global context.

Course Objectives

By the end of this course, students will:

1. Understand the fundamentals of international financial markets.
2. Analyze currency exchange rates and their impact on global trade.
3. Evaluate investment opportunities and financial risks in an international setting.
4. Apply financial theories to real-world international finance issues.

Course Outcomes

Students will be able to:

1. Demonstrate knowledge of international financial systems and instruments.
2. Analyze the impact of currency fluctuations on international business.
3. Develop strategies for managing international financial risks.
4. Present and discuss international finance concepts and solutions effectively.

Course Modules

Module 1: Introduction to International Finance (10 hours)

- Overview of International Financial Markets
- Currency Exchange Rates and Foreign Exchange Markets
- International Monetary System and Institutions

Module 2: International Investment and Financial Risk Management (10 hours)

- Foreign Direct Investment (FDI) and Portfolio Investment
- Risk Management Techniques: Hedging, Diversification, and Currency Swaps
- Case Studies on International Financial Risk

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Module 3: Global Financial Strategies and Practices (10 hours)

- International Financial Management Strategies
- Cross-Border Mergers and Acquisitions
- Financial Regulations and Compliance in Different Countries

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Assessment Procedure

1. **Participation (10%)**: Engagement in class discussions and activities.
2. **Assignments/Quizzes (30%)**: Weekly quizzes and assignments based on module content.
3. **Project (30%)**: Group or individual project analyzing an international finance case, including detailed research and presentation.
4. **Final Exam/Presentation (30%)**: Comprehensive exam or presentation covering all course modules.

References

1. **"International Finance: Theory and Policy"** by J. C. Shapiro
   [Pearson, 2021]
2. **"International Financial Management"** by J. F. Wilson
   [Wiley, 2020]
3. **"Multinational Business Finance"** by D. K. Eiteman, A. I. Stonehill, and M. H. Moffett
   [Pearson, 2022]
4. **"Global Financial Markets and Institutions"** by D. S. Kidwell, R. S. Blackwell, and R. S. Smith
   [McGraw-Hill Education, 2021]

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RETAIL MANAGEMENT

DURATION - 30 HOURS

Course Overview:

This course offers an in-depth understanding of the retail industry, focusing on the strategies and operations involved in managing a retail business. It covers topics ranging from store layout and design to customer service, inventory management, and the impact of digital technologies on retailing. The course is designed for students who aspire to build a career in retail management or enhance their understanding of retail business operations.

Course Objectives:

- To provide students with a comprehensive understanding of the principles and practices of retail management.
- To explore the various components of retail operations, including store management, inventory control, and customer relationship management.
- To analyze the impact of technology on retail management and how it influences consumer behavior.
- To develop strategic thinking skills in the context of retail business planning and execution.

Course Outcomes:

By the end of this course, students will be able to:

1. Understand and apply the fundamental concepts of retail management.
2. Evaluate different retail formats and determine appropriate strategies for each.
3. Analyze the role of technology in transforming retail operations.
4. Develop effective retail strategies, including merchandising, pricing, and promotional activities.
5. Demonstrate the ability to manage retail operations, including inventory and supply chain management.

Module 1: Introduction to Retail Management (10 Hours)

- **Definition and Scope of Retailing**
- **Retail Formats and Types of Retailers**
- **Retail Marketing Mix**
- **Understanding Consumer Behavior in Retail**
- **Retail Market Segmentation and Targeting**
- **Retail Location Strategy**
- **Store Layout and Design**

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- **Visual Merchandising and Displays**
- **Retail Pricing Strategies**
- **Case Studies on Successful Retailers**

Module 2: Retail Operations and Supply Chain Management (10 Hours)

- **Retail Operations Management**
- **Inventory Management in Retail**
- **Category Management**
- **Logistics and Supply Chain in Retail**
- **Vendor Relationship Management**
- **Retail Technology and Information Systems**
- **Omni-Channel Retailing**
- **E-commerce and its Impact on Retail**
- **Retail Store Operations and HR Management**
- **Case Studies on Retail Operations**

Module 3: Retail Strategy and Customer Relationship Management (CRM) (10 Hours)

- **Retail Strategy Formulation**
- **Retail Brand Management**
- **Customer Relationship Management (CRM)**
- **Customer Service in Retail**
- **Retail Promotions and Advertising**
- **Loyalty Programs and Customer Retention**
- **Ethical Issues in Retail Management**
- **Sustainability in Retail**
- **Global Retailing Trends**
- **Case Studies on Retail Strategies**

Assessment Procedure:

1. **Assignments (30%):**
   - Two individual assignments based on real-life retail case studies.
2. **Mid-term Exam (20%):**
   - Written exam covering Modules 1 and 2.
3. **Group Project (20%):**
   - Analysis of a retail business and presentation of a strategic plan.
4. **Final Exam (30%):**
   - Comprehensive exam covering all three modules.

References:

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1. Berman, B., & Evans, J. R. (2018). *Retail Management: A Strategic Approach*. 13th Edition. Pearson.
2. Levy, M., Weitz, B. A., & Grewal, D. (2019). *Retailing Management*. 10th Edition. McGraw-Hill Education.
3. Dunne, P. M., Lusch, R. F., & Carver, J. R. (2013). *Retailing*. 8th Edition. Cengage Learning.
4. Pradhan, S. (2017). *Retailing Management: Text and Cases*. 5th Edition. McGraw-Hill Education.

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ETHICAL HACKING

DURATION - 30 HOURS

Course Overview:

This course is designed to provide students with a comprehensive understanding of ethical hacking and penetration testing methodologies. It covers various aspects of network security, system vulnerabilities, and ethical hacking practices that are essential to protect information systems. The course will equip students with the skills required to assess and improve the security of computer systems and networks through ethical hacking techniques.

Course Objectives:

- To introduce students to the fundamental concepts and techniques of ethical hacking.
- To develop the ability to identify and exploit vulnerabilities in computer systems and networks.
- To provide hands-on experience in using hacking tools and techniques in a controlled and ethical manner.
- To understand the legal and ethical issues associated with hacking and penetration testing.
- To prepare students for certifications in ethical hacking and information security.

Course Outcomes:

By the end of this course, students will be able to:

1. Understand the principles and practices of ethical hacking.
2. Identify security vulnerabilities in computer systems and networks.
3. Apply ethical hacking techniques to perform penetration testing.
4. Use various tools and methodologies to assess the security of information systems.
5. Understand the legal, ethical, and professional issues related to ethical hacking.

Module 1: Introduction to Ethical Hacking (10 Hours)

- **Definition and Scope of Ethical Hacking**
- **Types of Hackers: White Hat, Black Hat, and Grey Hat**
- **Legal and Ethical Considerations in Hacking**
- **Phases of Ethical Hacking**
  - Reconnaissance
  - Scanning
  - Gaining Access
  - Maintaining Access
  - Covering Tracks

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- **Introduction to Penetration Testing**
- **Types of Attacks and Common Vulnerabilities**
- **Case Studies: Ethical Hacking in Action**

Module 2: Hacking Techniques and Tools (10 Hours)

- **Footprinting and Reconnaissance Techniques**
- **Network Scanning and Enumeration**
- **System Hacking and Vulnerability Exploitation**
- **Malware and Trojans**
- **Social Engineering Techniques**
- **Denial of Service (DoS) and Distributed Denial of Service (DDoS) Attacks**
- **Web Application Hacking**
- **Wireless Network Hacking**
- **Introduction to Hacking Tools (e.g., Metasploit, Nmap, Wireshark)**
- **Case Studies: Real-World Hacking Incidents**

Module 3: Advanced Ethical Hacking and Countermeasures (10 Hours)

- **Advanced Network Penetration Testing**
- **Exploitation Frameworks**
- **Buffer Overflows and Exploit Development**
- **Advanced Web Application Hacking**
- **Cloud Security and Hacking**
- **Mobile Platform Hacking**
- **Incident Response and Forensics**
- **Countermeasures and Defensive Techniques**
- **Ethical Hacking Certifications (CEH, OSCP, etc.)**
- **Case Studies: Ethical Hacking for Cybersecurity**

Assessment Procedure:

1. **Assignments (30%):**
   - Two individual assignments based on ethical hacking scenarios.
2. **Mid-term Exam (20%):**
   - Written exam covering Modules 1 and 2.
3. **Lab Work and Practical Assignments (20%):**
   - Hands-on penetration testing and ethical hacking exercises.
4. **Final Exam (30%):**
   - Comprehensive exam covering all three modules.

References:

1. EC-Council. (2018). *Certified Ethical Hacker (CEH) Official Study Guide*. Wiley.

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2. Grimes, R. A. (2017). *Hacking the Hacker: Learn From the Experts Who Take Down Hackers*. Wiley.
3. Engebretson, P. (2013). *The Basics of Hacking and Penetration Testing*. Syngress.
4. Simpson, M., Backman, K., & Corley, J. (2019). *Hands-On Ethical Hacking and Network Defense*. Cengage Learning.
5. Timm, K., & Perez, R. (2018). *Network Security: Assessment and Testing*. Wiley.

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Phone: 0484 2224954, 2226449

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Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

DEPATRMENT OF BUSINESS ADMINISTRATION

ADD ON COURSE: PUBLIC RELATIONS

COURSE CODE:ADBBA2107

Coordinator : Betna Rodrigues

2023-2024 SIXTH SEMESTER

DURATION OF THE COURSE: 30 HOURS

COURSE OVERVIEW

A course overview of Public Relations (PR) typically encompasses a comprehensive study of the principles, strategies, and practices involved in managing and maintaining the relationship between organizations and their various stakeholders. Throughout the course, students delve into the fundamental concepts of PR, including its historical development, theories, and ethical considerations. They explore the role of PR in shaping organizational reputation, managing crises, and fostering mutually beneficial relationships with the media, government, community, consumers, and other stakeholders. Additionally, students learn practical skills such as writing press releases, creating PR campaigns, managing social media presence, and conducting media relations. Case studies and real-world examples are often incorporated to provide students with practical insights into the application of PR strategies across different industries and contexts. Overall, the course aims to equip students with the knowledge, skills, and ethical framework necessary to excel in the dynamic field of public relations.

OBJECTIVE OF THE COURSE

- To understand the role and importance of public relations in organizational communication
- To explore key concepts and theories in public relations practice
- To develop skills in strategic planning, message development, and media relations
- To examine ethical and legal considerations in public relations

Module 1

Meaning, Nature and Scope of Public Relations

- Introduction
- Meaning of public relations
- Nature and scope of public relations
- Functions of public relations
- Role of public relations
- Components of public relations (10 HOURS)

Module 2

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Public Relations, Publicity, Propaganda and Advertising

- Introduction
- Public relation and press
- Public relation and publicity
- Public relation and propaganda
- Public relations and advertising (10 HOURS)

Module 3

Public Relations and Indian Environment

- Introduction
- Development of public relations in India
- Phase of Conscious activity
- Post Independent Phase
- Public relation Society of India
- Indian Public Relation Association (10 HOURS)

MODE OF ASSESSMENT

- Examinations: This includes multiple choice questions, short answer questions and essays

REFERENCES

- "Public Relations: Strategies and Tactics" by Dennis L. Wilcox, Glen T. Cameron, and Bryan H. Reber (or another relevant textbook)
- Public Relations: Principles and Practices" by S. S. Gulshan
- "Public Relations: Concepts, Practice, and Critique" by N. B. Nair and Indira J. Parikh
- "Public Relations: The Profession and the Practice" by P. K. K. Nair

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AUDITING
COURSE CODE: ADBBA2108
Coordinator : Jeffy Thomas

2nd YEAR 2020-23 BATCH

Course Overview

The Auditing course provides students with a comprehensive understanding of the principles and practices of auditing, including the examination and evaluation of financial statements, records, and systems.

Course Objectives

1. To learn the fundamental principles and practices of auditing
2. To provide insights into various business processes which helps to understand how different parts of a business function and interact
3. To prepare students for careers in auditing and related fields

Outcome of the course

- Gaining comprehensive understanding of auditing standards, principles and practices
- Enable students to understand the duties and responsibilities of auditors
- Provides a foundation for students who intend pursuing a specialized pathway in the auditing profession

Course Outline

1. Introduction to auditing (15 Hours)

auditing- meaning and definition- difference between accounting and auditing- objectives- qualities of an auditor- advantages of auditing- limitations- types of audit- considerations before commencing a new audit- audit program- objectives- types- audit notebook- audit working papers- audit committee- audit memorandum- audit manual- flow charts

2. Recent trends in auditing (15 Hours)

Recent trends in auditing - cost audit- objectives- tax audit- objectives- management audit- objectives- social audit- objectives- govt. audit- objectives- performance audit- objectives- auditing in EDP environment- audit assurance standards- meaning and scope

Mode of Assessment

- Exam: Comprehensive exam covering all course topics

Reference books

1. The Internal Auditing Pocket Guide: Preparing, Performing, Reporting and Follow-up - J. P. Russell
2. Auditing and Assurance Services - Al Arens, Randy Elder and Mark S. Beasley
3. Simplified Approach to Advanced Auditing and Professional Ethics - CA Vikas

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Mrudula Menon V.
Principal-in-Charge
The Cochin College

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Mrudula Menon V.
Principal-in-Charge
The Cochin College

Phone: 0484 2224954, 2226449
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email: email@thecochincollege.edu.in

DEPARTMENT OF BUSINESS ADMINISTRATION
VALUE ADDED COURSE

Name of the course : Effective Leadership Skills
COURSE CODE:ADBBA2109
Duration of the course : 30 hrs.
Academic year:- 2021- 2022 (3rd year BBA)
Coordinator : Rajitha P M

Course Overview
Effective leadership skills encompass a range of qualities and behaviors that inspire and guide teams toward common goals.

Objective of the course
• To make the students industry ready.
• To attain the objective in the effective manner.
• To enrich the student knowledge.

Course outcomes
This aim to equip participants with the skills and mindset necessary to lead effectively in various organizational contexts.

Syllabus
Module 1 :- Leadership (10 hours)
Leadership- Meaning – Importance - Leadership Styles – Leaders Vs Managers- Power and politics sources of power

Module 2 - Leadership theories (10 hours)
Managerial contingency Theory – Theory X and Y, Situational theory, Path goal Theory – Leader Participation Model, Leader member Exchange theory, 3 D model of Leadership- Transformation leadership Theory

Module 3 - Methods for leading (10 hours)
Leading the team – Introduction – Forming – Storming – Norming – Performing – Adjourning or Mourning – Your approach during each Phase

Mode of Assessment
Final Exam :comprehensive exam covering all course topics

Reference Book
The 7 Habits of Highly Effective People" by Stephen Covey
Leaders Eat Last" by Simon Sinek.

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Brochure & Syllabus
Certificate/Value added courses offered during 2021 – 2022

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CERTIFICATE COURSE

Department of Chemistry (SF), The Cochin College

ADCSF2103**:** Chemical Waste Management

Duration 30 Hours

****Course Description:****

This course offers an in-depth examination of chemical waste management practices, regulations, and strategies for minimizing environmental impact and ensuring safety in handling and disposal of chemical waste.

****Prerequisites:****

Knowledge on the properties of various chemicals. This includes understanding their reactivity, toxicity, volatility, and persistence in the environment.

****Week 1: Introduction to Chemical Waste Management**** (6 hours)

- Overview of chemical waste: types, sources, and hazards.
- Importance of proper chemical waste management in environmental protection and human health.
- Regulatory frameworks and standards governing chemical waste disposal.

****Week 2: Chemical Waste Minimization and Source Reduction**** (6 hours)

- Principles of waste minimization and pollution prevention.
- Strategies for reducing chemical waste generation at the source.
- Case studies on successful waste minimization programs in various industries.

****Week 3: Hazardous Chemical Waste Handling and Storage**** (6 hours)

- Safe handling practices for hazardous chemical waste.
- Storage requirements and guidelines for hazardous chemicals.
- Chemical compatibility and segregation principles.

****Week 4: Chemical Waste Treatment and Disposal Methods**** (6 hours)

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- Overview of chemical waste treatment technologies: physical, chemical, and biological methods.
- Hazardous waste incineration, chemical neutralization, and biological treatment.
- Land disposal options: secure landfills and deep well injection.

Week 5: Emerging Trends and Future Directions (6 hours)

- Emerging technologies in chemical waste management: nanotechnology, green chemistry, and alternative materials.
- Sustainable approaches to chemical waste management.
- Case studies on innovative waste management solutions and best practices.

Assessment:

- Weekly quizzes and assignments (40%)
- Mid-term exam (20%)
- Final project (30%)
- Class participation and engagement (10%)

Textbook:

"Chemical Waste Management and Disposal" by Paul T. Williams.

References:

- "Hazardous Waste Management" by Michael D. LaGrega, Phillip L. Buckingham, and Jeffrey C. Evans.
- "Chemical Fate and Transport in the Environment" by Harold F. Hemond and Elizabeth J. Fechner.

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CONSERVATION BIOLOGY

Course Overview

This 30-hour certificate course in conservation biology provides a comprehensive introduction to the principles and practices of conserving biodiversity. Designed for students, professionals, and enthusiasts, the course covers fundamental concepts, conservation strategies, and real-world applications.

Course Objectives

1. Understand Biodiversity: Introduce the concept of biodiversity and its importance.
2. Identify Threats: Learn about the various threats to biodiversity, including habitat loss, climate change, and invasive species.
3. Conservation Strategies: Explore strategies for conserving species and ecosystems.
4. Legal and Policy Frameworks: Understand the legal and policy measures in place for conservation.
5. Community and Global Initiatives: Study the role of local communities and international organisations in conservation.
6. Practical Applications: Apply theoretical knowledge through case studies and hands-on activities.

Course Outline

1. Introduction to Conservation Biology (3 hours)
    - Definition and scope
    - History and evolution of conservation biology
    - Importance of biodiversity
2. Biodiversity and Ecosystem Services (4 hours)
    - Levels of biodiversity (genetic, species, ecosystem)
    - Ecosystem services and their value to humans

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3. Threats to Biodiversity (5 hours)
    - Habitat destruction and fragmentation
    - Climate change impacts
    - Pollution and overexploitation
    - Invasive species
4. Conservation Strategies (5 hours)
    - In situ and ex situ conservation
    - Protected areas and wildlife reserves
    - Conservation genetics
    - Restoration ecology
5. Legal and Policy Frameworks (4 hours)
    - International treaties and conventions (e.g., CITES, CBD)
    - National conservation laws and policies
    - Role of NGOs and policy advocacy
6. Community-Based Conservation (4 hours)
    - Importance of local communities in conservation
    - Case studies of successful community-based initiatives
    - Integrating traditional knowledge with modern conservation practices
7. Global Conservation Initiatives (3 hours)
    - Role of international organizations (e.g., IUCN, WWF)
    - Global conservation programs and their impacts
    - Funding and support for conservation projects
8. Case Studies and Practical Applications (2 hours)
    - Analysis of successful and unsuccessful conservation projects
    - Practical exercises and fieldwork simulations

Mode of Assessment

- Quizzes: Weekly quizzes to assess understanding of the material (30% of the final grade).

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- Assignments: Practical assignments and case studies (40% of the final grade).
- Final Exam: Comprehensive exam covering all course topics (30% of the final grade).

Reference Books

1. "Conservation Biology: Foundations, Concepts, Applications" by Fred Van Dyke
2. "Principles of Conservation Biology" by Martha J. Groom, Gary K. Meffe, and C. Ronald Carroll
3. "Essentials of Conservation Biology" by Richard B. Primack
4. "Fundamentals of Conservation Biology" by Malcolm L. Hunter Jr. and James P. Gibbs
5. "Conservation Science: Balancing the Needs of People and Nature" by Peter Kareiva and Michelle Marvier
6. "Community-based Conservation: Perspectives from Africa" edited by David Western, R. Michael Wright, and Shirley C. Strum

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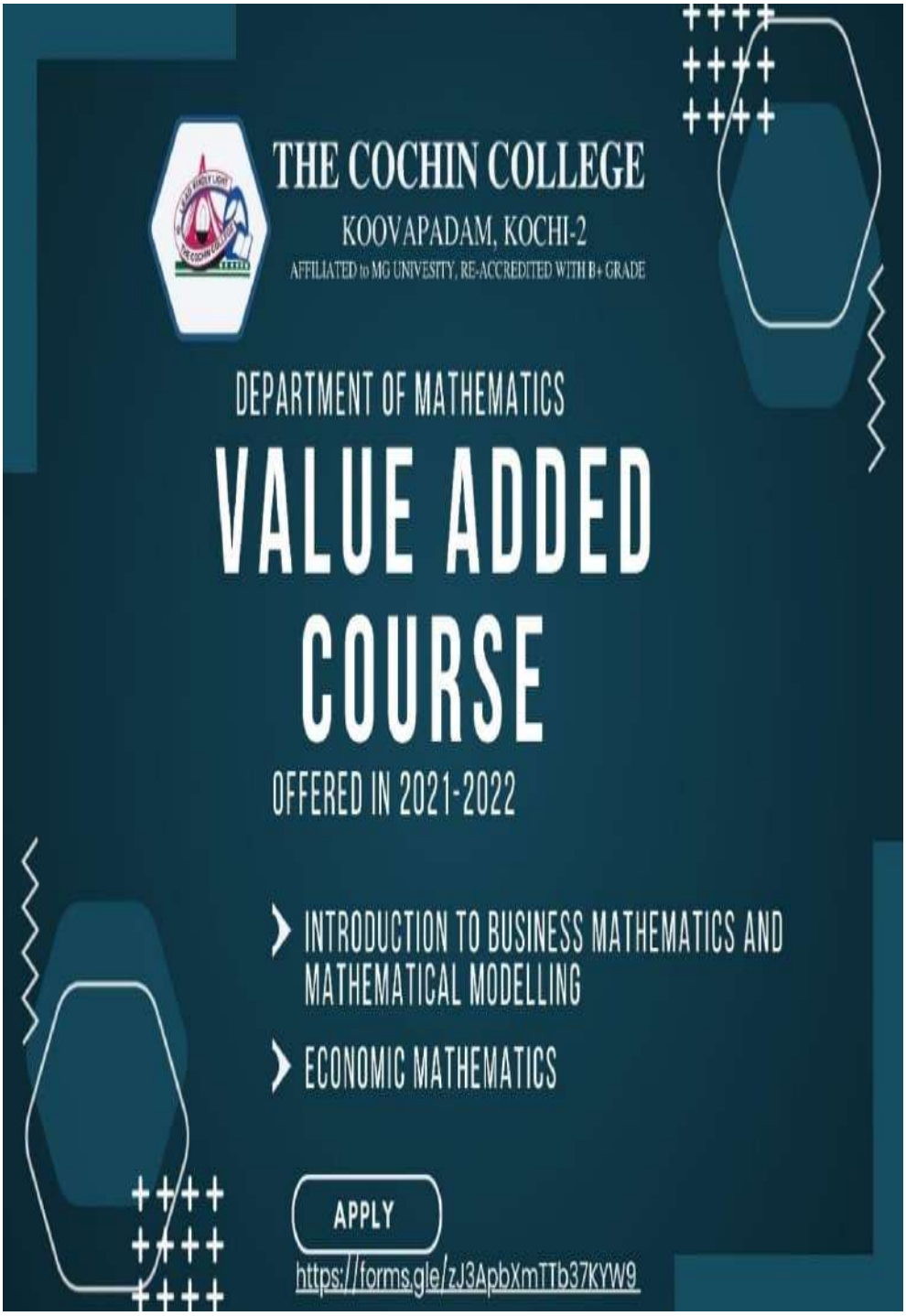

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Introduction to Business Mathematics and Mathematical modelling in Business

Course objective:

This course aims to provide essential mathematical skills and concepts useful in business contexts.

Prerequisites:

- Comprehensive overview of key mathematical concepts applied in business contexts, ensuring students gain both theoretical knowledge and practical skills.

Week 1 : Basic Concepts and Applications

Session 1: Basic Concepts and Applications (6 hours)

1. **Introduction to Business Mathematics**

- Importance and applications in business

- Overview of mathematical tools

2. **Fundamentals of Algebra**

- Basic algebraic operations

- Linear equations and inequalities

- Functions and their graphs

3. **Mathematics of Finance**

- Simple and compound interest

- Present and future value of money

- Annuities and perpetuities

Week 2 : Statistics and Data Analysis

Session 2: Statistics and Data Analysis (6 hours)

1. **Descriptive Statistics**

- Mean, median, mode

- Variance and standard deviation

- Data visualization (graphs and charts)

2. **Probability Basics**

- Definitions and rules of probability

- Conditional probability and independence

- Probability distributions (normal, binomial)

3. **Inferential Statistics**

- Sampling methods

- Confidence intervals

- Hypothesis testing

Week 3 : Calculus in Business

####Session 3: Calculus in Business (6 hours)

1. **Introduction to Calculus**

- Limits and continuity

- Differentiation and its rules

- Applications of derivatives in business (marginal analysis, optimization)

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2. **Integration and Applications**

- Basic integration techniques

- Definite and indefinite integrals

- Applications in business (consumer surplus, producer surplus)

Week 4 : Linear Programming and Optimization

Session 4: Linear Programming and Optimization (6 hours)

1. **Linear Programming**

- Formulation of linear programming problems

- Graphical solution method

- Simplex method basics

2. **Decision Making and Optimization**

- Decision-making under certainty and uncertainty

- Break-even analysis

- Sensitivity analysis

Week 5 : Applied Business Mathematics

Session 5: Applied Business Mathematics (6 hours)

1. **Mathematical Modeling in Business**

- Formulating business problems into mathematical models

- Solving and interpreting models

2. **Inventory Management**

- Economic order quantity (EOQ)

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- Safety stock and reorder points
- Inventory control models

3. **Project Management and Network Analysis**
- Critical path method (CPM)
- Program evaluation and review technique (PERT)
- Time-cost trade-offs

Teaching Methodology
- **Lectures**: 10 hours
- **Hands-on Practice**: 10 hours (includes problem-solving sessions, case studies, and data analysis)
- **Project Work**: 5 hours (real-life business problem modeling and solution)
- **Assessment**: 5 hours (quizzes, mid-term and final tests, project presentations)

Resources
- Textbook: “Business Mathematics” by Clendenen and Salzman
- Software: MS Excel, SPSS/R for data analysis, specialized business mathematics tools

Assessment
- **Quizzes and Assignments**: 20%
- **Mid-term Exam**: 20%
- **Project Work**: 30%
- **Final Exam**: 30%

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Economic Mathematics ###

Course Duration: 30 Hours ###

Course Objective: To provide students with an understanding of the mathematical methods and models used in economic analysis, enabling them to apply these techniques to solve economic problems and interpret economic data.

Prerequisite:

*Basic Algebra: Understanding of algebraic expressions, equations, and functions.
*Basic Calculus: Familiarity with the concepts of differentiation and integration.
*Elementary Statistics: Knowledge of basic statistical measures (mean, median, mode, variance, standard deviation).

*Basic Economics: Introductory knowledge of microeconomics and macroeconomics principles.

Course Outline:

Week 1 : Introduction to Economics and basic mathematic tools

Session 1: Introduction to Economic Mathematics (4 hours)

1. **Introduction to Economic Mathematics** - Importance of mathematics in economics – Overview of key mathematical concepts

2. **Basic Mathematical Tools** - Algebra review: equations, inequalities, and functions

Calculus basics: limits, continuity, and derivatives

*Week 2 : Differentiation and Applications in Economics

Session 2: Differential Calculus and Applications in Economics (6 hours)

1. **Differentiation** - Rules of differentiation – Higher-order derivatives

2. **Applications in Economics** - Marginal analysis: marginal cost, revenue, and utility – Elasticity of demand and supply – Optimization problems: profit maximization, cost minimization

Week 3 : Integration and Applications in Economics.

Session 3: Integral Calculus and Economic Applications (4 hours)

1. **Integration** - Indefinite and definite integrals – Techniques of integration

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2. **Applications in Economics** - Consumer and producer surplus – Economic growth models – Accumulation functions

Week 4: Linear Algebra and Matrix Methods and it's Applications in Economics

Session 4: Linear Algebra and Matrix Methods (6 hours)

1. **Introduction to Linear Algebra** - Vectors and matrices – Matrix operations: addition, multiplication, and inversion

2. **Applications in Economics** - Input-output analysis – Solving systems of linear equations – Linear programming: simplex method and economic interpretation Week 5 : Differential Equations and Applications in Economics

Session 5: Differential Equations and Dynamic Models (4 hours)

1. **Basic Concepts** - Ordinary differential equations (ODEs) – First-order and second-order ODEs

2. **Applications in Economics** - Dynamic models in economics: Solow growth model – Phase diagrams and stability analysis

Week 6 : Statistics in Economics #### Session 6: Probability and Statistics for Economists (6 hours)

1. **Introduction to Probability** - Basic concepts: probability, random variables, and distributions – Expected value and variance
2. **Statistics in Economics** - Descriptive statistics: measures of central tendency and dispersion – Inferential statistics: hypothesis testing and confidence intervals – Regression analysis: simple linear regression and multiple regression ### Course Materials:
   - **Textbook:** "Mathematics for Economists" by Carl P. Simon and Lawrence Blume
   ### Assessment: - **Quizzes (20%)**: Periodic quizzes to test understanding of key concepts. –
   Assignments (30%): Problem sets and applied projects. –
   Midterm Exam (20%): A written exam covering the first half of the course. -
   Final Exam (30%): A comprehensive written exam covering all course material.

Mrudula Menon V.
Principal-in-Charge
The Cochin College

Phone: 0484 2224954, 2226449

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(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

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Brochure & Syllabus

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VALUE ADDED COURSE
Department of Physics, The Cochin College.
ADPHY2105: Evaluations for Physics in action! Everyday Applications
Duration: 30 Hours

Module 1: Introduction to Electronics (4 hours)

- Basic electronic components: resistors, capacitors, transistors, diodes, integrated circuits (ICs).
- Passive and active components, their functions and circuit symbols.
- Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL) for analyzing DC circuits.

Module 2: Problem-Solving in DC Circuits (6 hours)

- Applying KCL and KVL to analyze series, parallel, and combination circuits.
- Voltage and current division rules.
- Thevenin's and Norton's theorems for analyzing complex circuits.
- Techniques for solving word problems related to DC circuits.

Module 3: Introduction to Analog Electronics (6 hours)

- Operational amplifiers (op-amps) and their basic configurations (inverting, non-inverting, voltage follower).
- Applications of op-amps: amplifiers, comparators, filters.
- RC circuits: time constants, capacitor charging and discharging.
- Diodes and their applications in rectification and clipping circuits.

Module 4: Hands-on Labs with Electronics (6 hours)

- Building and testing basic electronic circuits on breadboards using resistors, capacitors, and LEDs.
- Verifying circuit behavior through measurements using multimeters.
- Troubleshooting common circuit problems.

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- Introduction to circuit simulation software (e.g., SPICE, LTspice) and its use for circuit analysis.

Module 5: Problem-Solving in AC Circuits (4 hours)

- Introduction to AC circuits: sine waves, peak and average values, RMS values.
- Capacitive and inductive reactance, impedance in AC circuits.
- Phase relationships between voltage and current in AC circuits.
- Thevenin's and Norton's theorems applied to AC circuits.

Module 6: Applications and Integration (4 hours)

- Real-world applications of basic electronic circuits: power supplies, signal amplifiers, filters.
- Interfacing electronics with sensors and actuators for data acquisition and control systems.
- Integration of physics concepts with electronic circuits for solving problems in areas like optics, mechanics, and biophysics (depending on instructor's expertise and student interest).

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VALUE ADDED COURSE
Department of Physics, The Cochin College.
ADPHY2106: Numerical Methods in Computational Physics
Duration: 30 Hours

Overview: Numerical methods play a crucial role in computational physics, enabling physicists to solve complex mathematical problems that arise in various fields such as mechanics, electromagnetism, quantum physics, and more. This 30-hour course is designed to equip students with the necessary skills to understand, implement, and apply numerical methods in computational physics. Through lectures, hands-on programming exercises, and projects, participants will gain practical experience in solving physics problems numerically using Python.

Week 1: Introduction to Numerical Methods

- Session 1 (2 hours): Overview of numerical methods in computational physics. Importance and applications of numerical methods in physics.
- Session 2 (2 hours): Error analysis in numerical computations. Sources of error: round-off error, truncation error, and stability analysis.
- Session 3 (2 hours): Numerical differentiation: forward difference, backward difference, and central difference methods. Error analysis and practical implementation.
- Session 4 (2 hours): Numerical integration: trapezoidal rule, Simpson's rule, and Romberg integration. Error analysis and applications in physics problems.

Week 2: Ordinary Differential Equations (ODEs)

- Session 5 (2 hours): Introduction to ordinary differential equations (ODEs). Classification of ODEs and initial value problems (IVPs).
- Session 6 (2 hours): Euler's method for solving first-order ODEs. Implementation and stability analysis.
- Session 7 (2 hours): Runge-Kutta methods: second-order and fourth-order methods. Comparison with Euler's method and practical applications.
- Session 8 (2 hours): Higher-order ODEs and systems of ODEs. Numerical solutions using Runge-Kutta methods.

Week 3: Partial Differential Equations (PDEs)

- Session 9 (2 hours): Introduction to partial differential equations (PDEs). Classification of PDEs: elliptic, parabolic, and hyperbolic equations.
- Session 10 (2 hours): Finite difference methods for solving PDEs. Explicit and implicit methods for heat equation and wave equation.

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- Session 11 (2 hours): Finite element methods (FEM) for solving PDEs. Basics of FEM and practical implementation for Poisson's equation.
- Session 12 (2 hours): Introduction to spectral methods for solving PDEs. Fourier transform, Chebyshev polynomials, and applications in computational physics.

Week 4: Monte Carlo Methods and Molecular Dynamics

- Session 13 (2 hours): Introduction to Monte Carlo methods. Basics of random number generation, sampling, and importance sampling.
- Session 14 (2 hours): Monte Carlo integration and importance sampling for high-dimensional integrals.
- Session 15 (2 hours): Applications of Monte Carlo methods in computational physics: Ising model, statistical physics, and quantum Monte Carlo.
- Session 16 (2 hours): Introduction to molecular dynamics simulations. Basics of molecular dynamics, Verlet algorithm, and practical implementation.

Week 5: Advanced Topics and Final Project

- Session 17 (2 hours): Advanced numerical techniques in computational physics: Fast Fourier Transform (FFT), finite volume methods, and lattice Boltzmann methods.
- Session 18 (2 hours): Introduction to parallel computing in computational physics. Basics of MPI (Message Passing Interface) and OpenMP.
- Session 19 (2 hours): Final project kick-off: students will work on a final project applying numerical methods to solve a physics problem of their choice.
- Session 20 (2 hours): Final project presentations and evaluations.

Assessment:

- Weekly assignments and programming exercises.
- Mid-term and final exams assessing understanding of numerical methods and their applications.
- Final project presentation and report evaluation.

Prerequisites:

- Basic understanding of calculus and physics principles.
- Proficiency in programming, preferably in Python.

Outcome: Upon completion of this course, students will have a solid understanding of various numerical methods used in computational physics and their applications. They will be able to implement and apply these methods to solve a wide range of physics problems numerically, laying the foundation for further studies or research in computational physics.

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Question Paper: Numerical Methods in Computational Physics

Duration: 3 Hours
Total Marks: 100

Section A: Multiple Choice Questions (20 Marks)

1. Which numerical method is used to find roots of nonlinear equations? a) Newton-Raphson method
   b) Euler's method
   c) Runge-Kutta method
   d) Gauss-Seidel method
2. Which method is commonly used for solving systems of linear equations numerically? a) Gaussian elimination
   b) Simpson's rule
   c) Trapezoidal rule
   d) Bisection method
3. Which numerical method is best suited for solving ordinary differential equations (ODEs) with constant coefficients? a) Euler's method
   b) Runge-Kutta method
   c) Finite difference method
   d) Jacobi method
4. Which method is used to interpolate between given data points? a) Newton's divided differences
   b) Secant method
   c) Simpson's rule
   d) LU decomposition
5. Which numerical method is used to find eigenvalues and eigenvectors of a matrix? a) QR decomposition
   b) Bisection method
   c) Lagrange interpolation
   d) Trapezoidal rule

Section B: Short Answer Questions (30 Marks)

6. Explain the concept of numerical stability in the context of computational physics.
7. Describe the process of numerical differentiation and its applications.
8. Compare the trapezoidal rule and Simpson's rule for numerical integration.
9. Discuss the importance of error analysis in numerical methods.

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10. Explain the concept of convergence in numerical methods with an example.

Section C: Problem Solving (Programming and Analysis) (50 Marks)

Question 11: Implement the Newton-Raphson method in Python to find a root of the equation f(x)=x3−5x2+2x+3f(x) = x^3 - 5x^2 + 2x + 3f(x)=x3−5x2+2x+3 starting from an initial guess.

Question 12: Solve the following system of linear equations using Gaussian elimination:

2x + y - z = 1 \\ x + 3y + 2z = 4 \\ 3x + 2y + 4z = 7 \end{cases} \]

Question 13: Write a Python program to solve the first-order ordinary differential equation \(\frac{dy}{dx} = x + y \) using the fourth-order Runge-Kutta method.

Question 14: Implement the trapezoidal rule in Python to numerically integrate \(\int_{0}^{1} x^2 \, dx \).

Question 15: Use Python to perform cubic spline interpolation on the given data points: ((0, 1), (1, 2), (2, 0), (3, -1)).

Section D:

Practical Coding (Simulation and Analysis) (20 Marks)

Question 16: Write a Python program to simulate projectile motion using numerical integration methods for both velocity and position.

Question 17: Develop a Python program to solve the heat equation numerically in 1D using the finite difference method.

Mrudula Menon V.
Principal-in-Charge
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Phone: 0484 2224954, 2226449

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KOCHI - 682 002

(Affiliated to Mahatma Gandhi University and Accredited by NAAC)

Website: www.thecochincollege.edu.in

email: email@thecochincollege.edu.in

VALUE ADDED COURSE
Department of Physics, The Cochin College.
ADPHY2107: Introduction to Open Computer Vision
Duration: 30 Hours

Course Objectives:

- Understand the basics of computer vision and the role of OpenCV.
- Learn how to perform basic image processing tasks using OpenCV.
- Gain practical experience with OpenCV through hands-on projects and applications.

Prerequisites:

Basic programming knowledge is helpful but not required.

Course Outline:

Session 1: Introduction to Python and Computer Vision

- Introduction to Python
- - Basic syntax
- - Data types and variables
- - Control structures (loops, conditionals)
- - Functions and modules
- Overview of Computer Vision
- Introduction to OpenCV
- - What is OpenCV?
- - History and Applications
- Installation of OpenCV
- - Setting up OpenCV with Python
- - Verifying the installation
- Basic operations with OpenCV
- - Reading, displaying, and writing images
- - Basic image properties

Session 2: Image Processing Fundamentals

- Basic Image Transformations
- - Resizing, scaling, and rotating images
- - Cropping images
- Image Types and Color Spaces
- - Grayscale images
- - BGR and RGB color spaces
- - Converting between color spaces

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- Drawing functions in OpenCV
- - Drawing lines, circles, rectangles, and text

Session 3: Image Thresholding and Filtering

- Image Thresholding
- - Simple thresholding
- - Adaptive thresholding
- Image Filtering
- - Averaging and Gaussian blurring
- - Median and bilateral filtering
- Edge Detection
- - Sobel and Scharr operators
- - Canny edge detector

Session 4: Geometric Transformations and Image Registration

- Geometric Transformations
- - Affine transformations
- - Perspective transformations
- Image Registration
- - Feature detection and description
- - Matching features between images

Mini Project: Basic Image Processing Application

Objective: Develop a basic image processing application using the concepts learned.

- Project Description: Create an application that allows users to load an image, apply various transformations (resize, rotate, crop), convert color spaces, apply thresholding and filtering, and detect edges.
- Project Deliverables:
- - Code for the application
- - A brief report (1-2 pages) describing the application features and the OpenCV functions used
- - A short demonstration (5-10 minutes) of the application in class

Course Materials:

- Recommended Textbook: 'Learning OpenCV 4 Computer Vision with Python' by Joe Minichino and Joseph Howse.
- Additional Resources:
- - OpenCV Documentation: https://docs.opencv.org/
- - Online tutorials and guides
- - GitHub repositories with example code and projects

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Assessment and Evaluation:

- Quizzes at the end of each session
- Assignments based on session topics
- Mini project to demonstrate understanding and application of OpenCV techniques

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DEPARTMENT OF BOTANY

ADD ON COURSE 2021-22

ADBOT2106-GARDENING AND LANDSCAPING

SYLLABUS

Course Duration: 30 Hours

Course Description:

This course provides a comprehensive introduction to gardening and landscaping. Students will learn about garden planning, plant selection, landscape design, and maintenance practices through a blend of theoretical knowledge and practical activities.

Course Objectives:

- Understand the basics of garden planning and landscape design.
- Identify and select appropriate plants for various gardening and landscaping needs.
- Learn about the maintenance and care of gardens and landscaped areas.

Course Outline:

Module 1: Garden Planning and Plant Selection (10 Hours)

- Introduction to Gardening and Landscaping
- Types of Gardens (Vegetable, Herb, Flower, Ornamental)
- Layout and Design Considerations
- Soil Preparation and Improvement
- Criteria for Plant Selection (Climate, Soil, Water, Aesthetic Value)
- Types of Plants (Trees, Shrubs, Perennials, Annuals, Ground Covers)

Module 2: Landscape Design and Hardscapes (10 Hours)

1. Principles of Landscape Design
   - Elements of Design (Line, Form, Texture, Color, Scale)
   - Design Principles (Unity, Balance, Transition, Proportion, Rhythm, Focalization)
   - Site Analysis and Planning
2. Hardscape Elements
   - Introduction to Hardscape Elements (Pathways, Patios, Decks)
   - Materials and Construction Techniques
   - Integrating Hardscapes with Plantings

Module 3: Maintenance and Sustainability (10 Hours)

1. Garden and Landscape Maintenance
   - Seasonal Maintenance Practices (Spring, Summer, Winter)
   - Lawn Care and Maintenance
   - Pruning, Trimming, and Fertilizing
   - Pest and Disease Management
2. Sustainable Gardening and Landscaping

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- Water Conservation Techniques
- Use of Native Plants
- Composting and Soil Health

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ADD ON COURSE 2021-22

ADBOT2105-FOOD PRESERVATION AND EXPORT

SYLLABUS

Course Duration: 30 Hours

Course Objectives:

- Understand the basic principles and techniques of food preservation.
- Learn about different methods of food preservation and their applications.
- Gain practical knowledge of preserving various types of food.
- Explore the logistics, regulations, and strategies involved in exporting preserved foods.
- Evaluate the safety, quality, and marketability of preserved foods for export.

Module 1: Principles and Methods of Food Preservation (10 hours)

1.1 Introduction to Food Preservation (2 hours)

- Definition and importance
- Principles of food preservation
    - Microbial growth and spoilage
    - Physical, chemical, and biological factors

1.2 Thermal Processing and Refrigeration (4 hours)

- **Thermal Processing**
    - Pasteurization and Sterilization
    - Canning: Principles, process, and equipment
    - Blanching: Purpose, methods, and effects on food quality
- **Refrigeration and Freezing**
    - Principles and equipment
    - Storage guidelines and shelf-life extension
    - Freezing techniques and equipment
    - Safe thawing methods

1.3 Dehydration and Chemical Preservation (4 hours)

- **Dehydration**
    - Principles of dehydration
    - Water activity and its impact
    - Drying methods: Sun drying, oven drying, and freeze drying
    - Packaging and storage of dried foods
- **Chemical Preservation**
    - Types of chemical preservatives and mechanisms of action
    - Smoking: Methods and equipment

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- Acidification and fermentation: Role and common foods

Module 2: Advanced and Innovative Preservation Techniques (10 hours)

2.1 High-Pressure Processing (HPP) and Pulsed Electric Fields (PEF) (3 hours)

- Principles and applications of HPP
- Mechanisms and uses of PEF

2.2 Irradiation and Modified Atmosphere Packaging (MAP) (3 hours)

- Irradiation methods and regulatory aspects
- Techniques and benefits of MAP

2.3 Quality Control and Safety (4 hours)

- **Sensory Evaluation of Preserved Foods**
  - Techniques and criteria
- **Nutritional Aspects**
  - Impact of preservation on nutrients
- **Food Safety Regulations**
  - Standards and guidelines
- **HACCP in Food Preservation**
  - Principles and implementation

Module 3: Export of Preserved Foods (10 hours)

- Importance of food preservation in export
- Transportation and storage of preserved foods
- Inventory management and warehousing
- International food safety standards and certifications
- Export documentation and procedures
- Trade regulations and tariffs

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