

Lecture 1 - RBE: Background and Overview

Lecture 2 - RBE Framework

Lecture 3 - RBE-Framework continuation and Major Procedural Elements

Lecture 4 - RBE-Major Procedural Elements (Continued...)

Lecture 5 - Risk Characterization

Lecture 6 - Reliability Characterization and Probability Distributions-Discrete Distribution

Lecture 7 - Probability Distributions - Continuous Distribution

Lecture 8 - Statistical Estimation in Probability Theory

Lecture 9 - Probability and Confidence Interval

Lecture 10 - Regression Analysis

Lecture 11 - Life Prediction : Introduction

Lecture 12 - Life Prediction : Related Aspects

Lecture 13 - Life Prediction and Assessment Approaches

Lecture 14 - Life Prediction : Accelerated Screening and Life Testing

Lecture 15 - Probabilistic Fracture Mechanic Approach

Lecture 16 - Introduction and Reliability Block Diagram (RBD)

Lecture 17 - RBD - System Redundancies

Lecture 18 - Fault Tree Analysis

Lecture 19 - Fault Tree Analysis Continuation and Event Tree Analysis

Lecture 20 - Markov Model

Lecture 21 - Dynamic Fault Tree

Lecture 22 - Dynamic Event Tree and Binary Decision Diagram

Lecture 23 - Common Cause Failure

Lecture 24 - Importance and Sensitivity Analysis

Lecture 25 - Maintainability

Lecture 26 - PRA-Introduction

Lecture 27 - PRA-Organizational and Quality Aspects

Lecture 28 - PRA-Qualitative Modeling and Analysis

Lecture 29 - PRA-Quantification of the PRA model

Lecture 30 - Monte Carlo Simulation, Root Cause Analysis

Lecture 31 - Low Power and Shutdown PRA

Lecture 32 - Internal Flood PRA

Lecture 33 - Level 1 Fire PRA

Lecture 34 - Seismic PRA

Lecture 35 - Level 2 and Level 3 PRA

Lecture 36 - Human Reliability- Introduction

Lecture 37 - State of the Art in Human-Reliability

Lecture 38 - Technique for Human Error Rate Prediction (THERP)

Lecture 39 - Human Cognitive Reliability (HCR) Method

Lecture 40 - CQB - Method Consciousness, Cognition, Conscience and Brain

Lecture 41 - Uncertainty - Introduction

Lecture 42 - Uncertainty: Overview, preliminary discussions considering selected approaches

Lecture 43 - Parametric Approach to Uncertainty

Lecture 44 - Uncertainty Modelling using Fuzzy Approach in RBE

Lecture 45 - Uncertainty – Bayesian, and Monte-Carlo technique

Lecture 46 - Scope of Course and Introduction

Lecture 47 - PoF and FMMECA

Lecture 48 - Failure Mechanism and Models

Lecture 49 - Virtual Qualification

Lecture 50 - Physical qualification and Prognostics

Lecture 51 - PHM Introduction

Lecture 52 - Prognostics and Health Management in RBE

Lecture 53 - Major AI and ML Techniques and Algorithms in PHM

Lecture 54 - Role of ANN technique in RUL Estimation

Lecture 55 - Uncertainty Management in PHM

Lecture 56 - RBE-Introduction

Lecture 57 - RBE for Life Extension in support of regulatory relicensing

Lecture 58 - RBE-Risk Monitor

Lecture 59 - RBE-Inservice-Inspection

Lecture 60 - RB Operator Support System

**NPTEL : Introduction to Japanese Language and Culture (General)**

**Co-ordinators : Mrs. Vatsala Misra**

Lecture 1 - Introduction to Japanese scripts

Lecture 2 - Jiko shoukai (Self introduction)

Lecture 3 - Dochira kara desu ka ( Where are you from?)

Lecture 4 - Senmon wa nan desu ka (What is your specialization?)

Lecture 5 - Kore wa hon desu (This is a book)

Lecture 6 - Ikura desu ka (How much is it?)

Lecture 7 - Ima nan-ji desu ka (What is the time now?)

Lecture 8 - Kaigi wa roku-ji-han kara desu (The meeting is from 6:30)

Lecture 9 - Ashita Tokyo e ikimasu. (I will go to Tokyo tomorrow)

Lecture 10 - Watashi wa mainichi roku-ji ni okimasu (I wake up at 6 o'clock everyday)

Lecture 11 - Itsu Kanpur e kimashita ka (When did you come to Kanpur?)

Lecture 12 - Y?binkyoku wa asoko ni arimasu (The post office is over there)

Lecture 13 - Rao san wa doko ni imasu ka (Where is Mr. Rao?)

Lecture 14 - Pikuniku e ikimash? (Let's go for a picnic)

Lecture 15 - Kesa pan to tamago o tabemashita (I ate eggs and bread for breakfast)

Lecture 16 - Depa-to no tonari no biru wa gink? desu (The building next to the department store is the bank)

Lecture 17 - Taj hoteru wa ookii hoteru desu(Hotel Taj is a big hotel)

Lecture 18 - Hoteru de nani o tabemashita ka (What did you eat at the hotel?)

Lecture 19 - Tokyo wa ?kikute kirei desu (Tokyo is big and beautiful)

Lecture 20 - Ko-hi- wa oishiku arimasen(Coffee is not tasty)

Lecture 21 - Hantai kotoba (Opposites)

Lecture 22 - Watashi wa mainichi miruku o nomimasu (I drink milk everyday)

Lecture 23 - Watashi wa oniisan ni kamera o moratta(I received a camera from my brother)

Lecture 24 - Nani o tabetai desu ka(What do you want to eat?)

Lecture 25 - Nani o sashiagemasu ka (Giving and Receiving)

Lecture 26 - Sensei wa watashi ni hon o kuremashita (My teacher gave me a book)

Lecture 27 - Chotto matte kudasai ( Just a minute please)

Lecture 28 - Ke-ki o tabete mite kudasai ( Eat and see how is the cake)

Lecture 29 - Nani o shite imasu ka(What are you doing?)

Lecture 30 - Tokyo ni sunde imasu ( I live in Tokyo)

Lecture 31 - Kanji ga kakemasu (I can write Kanji)

Lecture 32 - Im?to wa ningy? o hoshigatte imasu (My sister wants a doll)

Lecture 33 - Aisukuri-mu ga ke-ki yori suki desu (I like ice-cream more than cakes)

Lecture 34 - Kutsu o kai ni ikimasu ( I am going to buy shoes)

Lecture 35 - Ashita motto atsuku narimasu (It is going to become very hot tomorrow)

Lecture 36 - Rainen Tokyo e iku to omoimasu (I think I will go to Tokyo next year)

Lecture 37 - Pen de kaite mo ii desu ka(Is it alright to write in pen?)

Lecture 38 - Comprehensions and Expressions

Lecture 39 - Basic Kanji

Lecture 40 - Basic Kanji

[Lecture 1 - Introduction](#)

[Lecture 2 - Pre Siddhantic Astronomy](#)

[Lecture 3 - Siddhantic Astronomy](#)

[Lecture 4 - Astronomy in Medieval India](#)

[Lecture 5 - Introduction to Telescopic Astronomy and Concluding remarks](#)

# DIGIMAT - The No.1 Learning Management Platform for Creative Learning

## **NPTEL : NOC:Carbon Accounting and Sustainable Designs in Product Lifecycle Management (General)**

**Co-ordinators : Prof. Amandeep Singh Oberoi, Prof. Deepu Philip, Prof. Prabal Pratap Singh**

Lecture 1 - Productivity and Sustainability - Part 1

Lecture 2 - Measuring Productivity

Lecture 3 - Measures Affecting Productivity

Lecture 4 - Productivity and Sustainability - Part 2

Lecture 5 - Environmental Management system

Lecture 6 - Green System

Lecture 7 - Carbon Footprint

Lecture 8 - Carbon Credit Trading

Lecture 9 - Industrial Ecology and Carbon Footprint

Lecture 10 - Examples of Carbon Footprint Calculations

Lecture 11 - Examples of Carbon Footprint Calculations

Lecture 12 - Some More Green Thoughts and Footprints

Lecture 13 - Green Manufacturing

Lecture 14 - Partnership for a New Generation of Vehicles (PNGV)

Lecture 15 - Smart Design and Engineering

Lecture 16 - Road to Product Lifecycle Management - Part 1

Lecture 17 - Road to Product Lifecycle Management - Part 2

Lecture 18 - Road to Product Lifecycle Management - Part 3

Lecture 19 - Sustainability and Green Supply Chain - Part 1

Lecture 20 - Sustainability and Green Supply Chain - Part 2

Lecture 21 - Energy Transformations

Lecture 22 - PLM Components and levels - Part 1

Lecture 23 - PLM Components and levels - Part 2

Lecture 24 - PLM integration - Part 1

Lecture 25 - PLM integration - Part 2

Lecture 26 - Facility carbon accounting

Lecture 27 - Activities of emission - Part 1

Lecture 28 - Activities of emission - Part 2

Lecture 29 - Carbon and business data - Part 1

Lecture 30 - Carbon and business data - Part 2

Lecture 31 - Carbon and business data - Part 3

[Lecture 32 - Carbon accounting software - Part 1](#)

[Lecture 33 - Carbon accounting software - Part 2](#)

[Lecture 34 - Carbon Accounting Model - Part 1](#)

[Lecture 35 - Carbon Accounting Model - Part 2](#)

[Lecture 36 - Carbon Accounting Model - Part 3](#)

[Lecture 37 - Carbon Accounting Model - Part 4](#)

[Lecture 38 - Carbon Accounting Model - Part 5](#)

[Lecture 39 - Integrated PL,SLM and ALM](#)

[Lecture 40 - Environmental, Social and Governace \(ESG\) Systems](#)

[Lecture 41 - Carbon Accounting Databases - Part 1](#)

[Lecture 42 - Carbon Accounting Databases - Part 2](#)

[Lecture 43 - Carbon Accounting Databases - Part 3](#)

[Lecture 44 - Database Management Systems](#)

[Lecture 45 - Database Design](#)

[Lecture 46 - Terminologies in Database Design - I](#)

[Lecture 47 - Terminologies in Database Design - II](#)

[Lecture 48 - Database Schema - Part 1](#)

[Lecture 49 - Database Schema - Part 2](#)

[Lecture 50 - Database Normalization - Part 1](#)

[Lecture 51 - Database Normalization - Part 2](#)

[Lecture 52 - Carbon Accounting User Interface - Part 1](#)

[Lecture 53 - Carbon Accounting User Interface - Part 2](#)

[Lecture 54 - Carbon Accounting User Interface - Part 3](#)

**NPTEL : NOC:Stress Management (General)**

**Co-ordinators : Prof. Rajlakshmi Guha**

Lecture 1 - What is Stress

Lecture 2 - Sources of stress

Lecture 3 - Types of Stress

Lecture 4 - Personality Factors and Stress

Lecture 5 - Stress and the College Student

Lecture 6 - Stress and Nervous System

Lecture 7 - Hypothalamic-Pituitary-Adrenal (HPA) Axis

Lecture 8 - Effect of Stress on Immune System

Lecture 9 - Health Risk Associated with Chronic Stress

Lecture 10 - Stress and Major Psychiatric Disorders

Lecture 11 - Understanding your stress level

Lecture 12 - Role of Personality Pattern, Self Esteem, Locus of Control

Lecture 13 - Role of Thoughts Beliefs and Emotions - I

Lecture 14 - Role of Thoughts Beliefs and Emotions - II

Lecture 15 - Life Situation Intrapersonal : (Assertiveness, Time Management)

Lecture 16 - Developing Cognitive Coping Skills

Lecture 17 - Autogenic Training, Imagery and Progressive Relaxation

Lecture 18 - Other Relaxation Techniques

Lecture 19 - Exercise and Health

Lecture 20 - DIY Strategies Stress Management



# DIGIMAT - The No.1 Learning Management Platform for Creative Learning

**NPTEL : NOC:Outcome Based Pedagogic Principles for Effective Teaching (General)**

**Co-ordinators : Prof. Shyamal Kumar Das Mandal**

[Lecture 1 - Introduction to Need of 21st Century Education](#)

[Lecture 2 - Accreditation](#)

[Lecture 3 - Outcome based Learning](#)

[Lecture 4 - Approach to Design Outcome based Learning](#)

[Lecture 5 - Approach to Design Outcome based Learning \(Continued...\)](#)

[Lecture 6 - Instructional Design for Active Learning](#)

[Lecture 7](#)

[Lecture 8](#)

[Lecture 9](#)

[Lecture 10](#)

[Lecture 11](#)

[Lecture 12](#)

[Lecture 13](#)

[Lecture 14](#)

[Lecture 15](#)

[Lecture 16](#)

[Lecture 17](#)

[Lecture 18](#)

[Lecture 19](#)

[Lecture 20](#)

**NPTEL : Ayurvedic Inheritance of India (General)**

**Co-ordinators : Dr. M.S. Valiathan**

Lecture 1 - Roots of Ayurveda

Lecture 2 - Traditional Medicine in Buddhist India

Lecture 3 - Period of Systematization

Lecture 4 - Philosophical ideas in Ayurveda

Lecture 5 - Human Body in Health

Lecture 6 - Human Body in Disease

Lecture 7 - Food and Drinks

Lecture 8 - Code for Healthy Living

Lecture 9 - Diseases

Lecture 10 - Diagnosis and Prognosis

Lecture 11 - Medical Treatment of Diseases

Lecture 12 - Materia Medica

Lecture 13 - Surgical Treatment of Diseases

Lecture 14 - Surgical Instruments

Lecture 15 - Treatment of fractures; some surgical procedures

Lecture 16 - Principles and methods of rejuvenation: enhancement of sexual potency and fertility

Lecture 17 - Selection of Students: Oath at initiation: Process of Training

Lecture 18 - A Science Initiative in Ayurveda (ASIIA)

Lecture 19 - Ayurvedic Biology: Illustrative Studies

Lecture 20 - Conclusion: An Ayurvedic View of Life

**Co-ordinators : Dr. G. Phanikumar, Prof. C. Balaji, Dr. Arun K.Tangirala, Dr. Abhijit P. Deshpande, Prof. M.S. Ananth, Dr. Prathap Haridoss**

Lecture 1 - Insight into research

Lecture 2 - Role of Guide and Student

Lecture 3 - Art of Re-Search

Lecture 4 - Persistent small steps towards success

Lecture 5 - Overview of research

Lecture 6 - Overview of Literature Survey

Lecture 7 - Literature Survey using Web of Science

Lecture 8 - Literature Survey using Scopus

Lecture 9 - Writing Up

Lecture 10 - Tutorial on using BibTeX with LaTeX to add references to a document

Lecture 11 - Tutorial on using Microsoft Word with Bibliographic Sources

Lecture 12 - Tutorial on using Microsoft Word with endnote entries

Lecture 13 - Experimental skills

Lecture 14 - Data analysis - Part 1

Lecture 15 - Data analysis - Part 2

Lecture 16 - Modelling skills - Part 1

Lecture 17 - Modelling skills - Part 2

Lecture 18 - Safety in laboratory

Lecture 19 - How to make Technical presentation

Lecture 20 - Technical Writing

Lecture 21 - Creativity in research - Part 1

Lecture 22 - Creativity in research - Part 2

Lecture 23 - Creativity in Research - Part 3

Lecture 24 - Group discussion on Ethics in Research

Lecture 25 - Intellectual property - Part 1

Lecture 26 - Intellectual property - Part 2

Lecture 27 - DOE Part 1

Lecture 28 - DOE part 2

Lecture 29 - DOE part 3

Lecture 30 - DOE part 4

# DIGIMAT - The No.1 Learning Management Platform for Creative Learning

[Lecture 31 - DOE part 5](#)

[Lecture 32 - Research in Applied Mechanics](#)

[Lecture 33 - Research in Chemical Engineering](#)

[Lecture 34 - Research in Civil Engineering](#)

[Lecture 35 - Research in Computer Science and Engineering](#)

[Lecture 36 - Research in Engineering Design](#)

[Lecture 37 - Research in Humanities and Social Sciences](#)

[Lecture 38 - Research in Mechanical Engineering](#)

[Lecture 39 - Research in Metallurgical and Materials Engineering](#)

[Lecture 40 - Research in Ocean Engineering](#)

[Lecture 41 - Research in Management Studies](#)

[Lecture 42 - Research in Aerospace Engineering](#)

[Lecture 43 - Research in Biotechnology](#)

[Lecture 44 - Research in Chemistry](#)

[Lecture 45 - Research in Electrical Engineering](#)

[Lecture 46 - Research in Mathematics](#)

[Lecture 47 - Research in Physics](#)

[Lecture 48 - Discussion with Research Scholars](#)

Lecture 1 - Introduction

Lecture 2 - Origin of Life

Lecture 3 - Evolution

Lecture 4 - Cells

Lecture 5 - Biomolecules: Lipids

Lecture 6 - Biomolecules: Carbohydrates, Water

Lecture 7 - Biomolecules: Amino acids, Proteins

Lecture 8 - Biomolecules: Enzymes

Lecture 9 - Biomolecules: Nucleotides

Lecture 10 - Cell structure and function – Prokaryotes

Lecture 11 - Cell structure and function – Eukaryotes

Lecture 12 - Cell cycle

Lecture 13 - Cell division – mitosis

Lecture 14 - Cell division – meiosis

Lecture 15 - Culture growth

Lecture 16 - Mendelian genetics: Genetic disorders

Lecture 17 - Mendelian genetics: Mendelian inheritance principles

Lecture 18 - Mendelian genetics: Pedigree analysis

Lecture 19 - Mendelian genetics: Non-Mendelian inheritance

Lecture 20 - DNA replication

Lecture 21 - Transcription

Lecture 22 - Translation

Lecture 1 - Introduction to the Course

Lecture 2 - Introduction to the Winter School

Lecture 3 - Socio-algorithmic processes and the Everyday - Part 1

Lecture 4 - Socio-algorithmic processes and the Everyday - Part 2

Lecture 5 - Socio-algorithmic processes and the Everyday - Part 3

Lecture 6 - Data Protection and Privacy Regulation in the Digital Era - Part 1

Lecture 7 - Data Protection and Privacy Regulation in the Digital Era - Part 2

Lecture 8 - Data Protection and Privacy Regulation in the Digital Era - Part 3

Lecture 9 - Data-driven Identities - Part 1

Lecture 10 - Data-driven Identities - Part 2

Lecture 11 - Data-driven Identities - Part 3

Lecture 12 - Promises and Challenges of e-Health - Part 1

Lecture 13 - Promises and Challenges of e-Health - Part 2

Lecture 14 - Promises and Challenges of e-Health - Part 3

Lecture 15 - Digital Finance - Part 1

Lecture 16 - Digital Finance - Part 2

Lecture 17 - Digital and our everyday interactions with the state - Part 1

Lecture 18 - Digital and our everyday interactions with the state - Part 2

Lecture 19 - Digital and our everyday interactions with the state - Part 3

Lecture 20 - Creating a Machine Zone through Affected Feedback: Leisure and Entertainment on Social Media - Part 1

Lecture 21 - Creating a Machine Zone through Affected Feedback: Leisure and Entertainment on Social Media - Part 2

Lecture 22 - Creating a Machine Zone through Affected Feedback: Leisure and Entertainment on Social Media - Part 3

Lecture 1 - Introduction to the course

Lecture 2 - An Inexperienced Engineering Teacher's View

Lecture 3 - From traditional lecturing to helping students learn - 1

Lecture 4 - From traditional lecturing to helping students learn - 2

Lecture 5 - Better learning (Bloom's Taxonomy)

Lecture 6 - Problem based learning (PBL) and Problem Solving - Part 1

Lecture 7 - Problem based learning (PBL) and Problem Solving - Part 2

Lecture 8 - Writing Learning Outcomes for a Course

Lecture 9 - Active Learning

Lecture 10 - Cooperative Group Learning

Lecture 11 - Flipped Classroom

Lecture 12 - Effective Laboratory Courses

Lecture 13 - Assessment - Part 1

Lecture 14 - Assessment - Part 2

Lecture 15 - How can we use research in education? - Part A1

Lecture 16 - How can we use research in education? - Part A2

Lecture 17 - The Class, as a Whole - Part A3

Lecture 18 - Psychological Type (Orientation) and Learning - Part B

Lecture 19 - Cognitive Development Theories - Two Main Examples - Part C

Lecture 20 - Learning Theories - Part D

Lecture 21 - Feedback and Reflection - Part 1

Lecture 22 - Feedback and Reflection - Part 2

Lecture 23 - Feedback and Reflection - Part 3

Lecture 24 - Live Session 1

Lecture 25 - Live Session 2

Lecture 1 - Course mechanics

Lecture 2 - Goals and VR definitions

Lecture 3 - Historical perspective

Lecture 4 - Birds-eye view (general)

Lecture 5 - Birds-eye view (general) (Continued...)

Lecture 6 - Birds-eye view (hardware)

Lecture 7 - Birds-eye view (software)

Lecture 8 - Birds-eye view (sensation and perception)

Lecture 9 - Geometric modeling

Lecture 10 - Transforming models

Lecture 11 - Matrix algebra and 2D rotations

Lecture 12 - 3D rotations and yaw, pitch, and roll

Lecture 13 - 3D rotations and yaw, pitch, and roll (Continued...)

Lecture 14 - Axis-angle representations

Lecture 15 - Quaternions

Lecture 16 - Converting and multiplying rotations

Lecture 17 - Converting and multiplying rotations (Continued...)

Lecture 18 - Homogeneous transforms

Lecture 19 - The chain of viewing transforms

Lecture 20 - Eye transforms

Lecture 21 - Eye transforms (Continued...)

Lecture 22 - Canonical view transform

Lecture 23 - Viewport transform

Lecture 24 - Viewport transform (Continued...)

Lecture 25 - Three interpretations of light

Lecture 26 - Refraction

Lecture 27 - Simple lenses

Lecture 28 - Diopters

Lecture 29 - Imaging properties of lenses

Lecture 30 - Lens aberrations

Lecture 31 - Optical system of eyes



Lecture 32 - Photoreceptors

Lecture 33 - Sufficient resolution for VR

Lecture 34 - Light intensity

Lecture 35 - Eye movements

Lecture 36 - Eye movements (Continued...)

Lecture 37 - Eye movement issues for VR

Lecture 38 - Neuroscience of vision

Lecture 39 - Three Psychophysical Laws

Lecture 40 - Sensation and Perception

Lecture 41 - Psychophysics of Visual Perception

Lecture 42 - Gamma Encoding

Lecture 43 - Limiting Resolution

Lecture 44 - Depth perception

Lecture 45 - Depth perception (Continued...)

Lecture 46 - Motion perception from Visual System

Lecture 47 - Frame rates and displays

Lecture 48 - Frame rates and displays (Continued...)

Lecture 49 - Psychophysics of Depth Perception

Lecture 50 - Overview

Lecture 51 - Orientation tracking

Lecture 52 - Tilt drift correction

Lecture 53 - Yaw drift correction

Lecture 54 - Tracking with a camera

Lecture 55 - Perspective n-point problem

Lecture 56 - Filtering

Lecture 57 - Lighthouse approach

Lecture 58 - Visual Rendering-Overview

Lecture 59 - Visual Rendering-overview (Continued...)

Lecture 60 - Shading models

Lecture 61 - Rasterization

Lecture 62 - Pixel shading

Lecture 63 - VR-specific problems

Lecture 64 - Distortion shading

- Lecture 65 - Post-rendering image warp
- Lecture 66 - Why Haptics?
- Lecture 67 - What is Haptics?
- Lecture 68 - Branches of Haptics
- Lecture 69 - Human Haptics - Tactile System
- Lecture 70 - Kinesthetic System
- Lecture 71 - Motor System
- Lecture 72 - Haptic Devices and Interfaces - Kinesthetic Devices
- Lecture 73 - Haptic Devices and Interfaces - Tactile Devices
- Lecture 74 - Physics and Physiology
- Lecture 75 - Auditory perception
- Lecture 76 - Auditory localization
- Lecture 77 - Rendering
- Lecture 78 - Spatialization and display
- Lecture 79 - Combining other senses
- Lecture 80 - Interfaces -overview
- Lecture 81 - Evaluation of VR Systems
- Lecture 82 - Social interaction
- Lecture 83 - System control
- Lecture 84 - Manipulation
- Lecture 85 - Locomotion
- Lecture 86 - Principles of Perception
- Lecture 87 - Introduction to Kalman Filter
- Lecture 88 - Introduction to Extended Kalman Filter
- Lecture 89 - Grand Challenges in VR/AR
- Lecture 90 - Ultimate VR/AR System

Lecture 1 - Renewable Energy Technologies

Lecture 2 - Energy Usage by Humans - Estimate of Impact on Atmosphere

Lecture 3 - Conventional Sources of Energy

Lecture 4 - Non-Conventional Sources of Energy - An Overview

Lecture 5 - Energy consumption

Lecture 6 - Details of Energy usage in each sector

Lecture 7 - Consequences of Energy consumption

Lecture 8 - Solar Energy incident on Earth, Solar Spectrum

Lecture 9 - The Solar Energy Budget

Lecture 10 - Electromagnetic Radiation - The Solar Spectrum

Lecture 11 - Solar flat plate collector

Lecture 12 - Solar Radiator

Lecture 13 - Solar Energy - The Semiconductor

Lecture 14 - Solar energy - The p-n junction

Lecture 15 - Solar Cell - Growing the single crystal and making the p-n junction

Lecture 16 - Solar Energy - Interaction of p-n junction with radiation

Lecture 17 - Solar Energy - Solar cell characteristics and usage

Lecture 18 - Solar Energy - Solar cell construction

Lecture 19 - Solar Energy - Solar Photocatalysis

Lecture 20 - Wind Energy - Overview

Lecture 21 - Wind Energy - Energy Considerations

Lecture 22 - Wind Energy - Efficiency

Lecture 23 - Wind Energy - Parts and Materials

Lecture 24 - Wind Energy - Design Considerations

Lecture 25 - Ocean Thermal Energy - Conversion (OTEC)

Lecture 26 - Geothermal Energy

Lecture 27 - Geothermal Energy Technological aspects

Lecture 28 - Biomass Usage and Issues

Lecture 29 - Battery Basics

Lecture 30 - Battery Testing and Performance

Lecture 31 - Lithium ion Batteries

[Lecture 32 - Common Battery Structures and Types](#)

[Lecture 33 - Types of Fuel Cells](#)

[Lecture 34 - Fuel Processing for PEM Fuel Cells](#)

[Lecture 35 - Fuel Cells : Concept to Product](#)

[Lecture 36 - Characterization of Electrochemical Devices](#)

[Lecture 37 - Fuel Cells : Parts and Assembly](#)

[Lecture 38 - Supercapacitors](#)

[Lecture 39 - Flywheels](#)

[Lecture 40 - Magnetohydrodynamic Power Generation](#)

**NPTEL : NOC:Introduction to Remote Sensing (General)**

**Co-ordinators : Dr.Arun K.Saraf**

Lecture 1 - What is satellite based remote sensing?

Lecture 2 - Development of remote sensing technology and advantages

Lecture 3 - Different platforms of remote sensing.

Lecture 4 - Electromagnetic Spectrum, solar reflection and thermal emission

Lecture 5 - Interaction of EM radiation with atmosphere including atmospheric scattering, absorption and emission

Lecture 6 - Interaction mechanism of EM radiation with ground and spectral response curve

Lecture 7 - Principles of image interpretation

Lecture 8 - Multi-spectral scanners and imaging devices

Lecture 9 - Salient characteristics of Landsat, IRS, Cartosat, Resourcesat sensors

Lecture 10 - Image characteristics and different resolutions in Remote Sensing

Lecture 11 - Image interpretation of different geological landforms, rock types and structures

Lecture 12 - Remote Sensing Integration with GIS and GPS

Lecture 13 - Geo-referencing Technique

Lecture 14 - Basic Image Enhancement Techniques

Lecture 15 - Spatial Filtering, Band ratio and Principal Component Analysis techniques

Lecture 16 - Image Classification Techniques

Lecture 17 - InSAR Techniques in its applications

Lecture 18 - Hyperspectral Remote Sensing

Lecture 19 - Integrated applications of RS and GIS in groundwater studies

Lecture 20 - Limitations of Remote Sensing Techniques

Lecture 1 - Introduction to Technical Communications and their types

Lecture 2 - Title and an abstract

Lecture 3 - An abstract vs extended abstract vs summary

Lecture 4 - Keywords and Introduction sections

Lecture 5 - Background and review work

Lecture 6 - Data inputs and analytical methods

Lecture 7 - Results and discussion

Lecture 8 - Conclusions and acknowledgement

Lecture 9 - Letters, Email, SMS and WhatsApp message

Lecture 10 - Key components of a chart and types of plots

Lecture 11 - Key components of a chart and types of plots

Lecture 12 - Tables and captions

Lecture 13 - Key elements of a map figure

Lecture 14 - Power Point Presentations - 1

Lecture 15 - Power Point Presentations - 2

Lecture 16 - Power Point Presentations - 3

Lecture 17 - Project Proposals

Lecture 18 - References and bibliography

Lecture 19 - What is Plagiarism - 1

Lecture 20 - What is Plagiarism - 2

# DIGIMAT - The No.1 Learning Management Platform for Creative Learning

**NPTEL : NOC:Biomedical Ultrasound: Fundamentals of Imaging and Micromachined Transducers (General)**

**Co-ordinators : Prof. Himanshu Shekhar, Prof. Karla P. Mercado-Shekhar, Prof. Hardik J. Pandya**

- Lecture 1 - Introduction to the course
- Lecture 2 - Introduction to ultrasound imaging
- Lecture 3 - Basics of wave propagation
- Lecture 4 - Scattering and acoustic wave equation
- Lecture 5 - Intensity, Reflection, Transmission
- Lecture 6 - Recap of Week 1
- Lecture 7 - Introduction to Imaging modes
- Lecture 8 - Imaging artifacts
- Lecture 9 - Ultrasound imaging systems
- Lecture 10 - Transducers and transducer arrays
- Lecture 11 - Recap of Week 2
- Lecture 12 - Introduction to Microfabrication
- Lecture 13 - Silicon and Silicon Dioxide
- Lecture 14 - Numericals on Ultrasound
- Lecture 15 - Introduction to Cleanroom
- Lecture 16 - Silicon and Silicon Dioxide - II
- Lecture 17 - Thermal Oxidation - I
- Lecture 18 - Thermal Oxidation - II
- Lecture 19 - Thermal Evaporation theory
- Lecture 20 - Thermal Evaporation lab demonstration
- Lecture 21 - E beam Deposition theory
- Lecture 22 - E beam deposition lab demonstration
- Lecture 23 - Sputtering theory
- Lecture 24 - Sputtering lab demonstration
- Lecture 25 - Chemical Vapor Deposition - I
- Lecture 26 - Chemical Vapor Deposition - II
- Lecture 27 - Lithography
- Lecture 28 - Lithography lab demonstration
- Lecture 29 - Lithography optics - I
- Lecture 30 - Lithography optics - II
- Lecture 31 - Introduction to Beamforming

- Lecture 32 - Beamforming Pt 2
- Lecture 33 - Beamforming and Signal Processing
- Lecture 34 - Intro to Field II simulation - impulse response, beam pattern
- Lecture 35 - Recap of week 7
- Lecture 36 - Ultrasound image quality metrics
- Lecture 37 - Contrast agents
- Lecture 38 - Contrast-enhanced imaging
- Lecture 39 - Nonlinear acoustics and imaging
- Lecture 40 - Recap of week 8
- Lecture 41 - Field II imaging simulations
- Lecture 42 - Doppler ultrasound
- Lecture 43 - Color and Power Doppler ultrasound
- Lecture 44 - Quantitative Ultrasound
- Lecture 45 - Recap of week 9
- Lecture 46 - Ultrasound bioeffects
- Lecture 47 - Bioeffects and safety
- Lecture 48 - Ultrasound elastography
- Lecture 49 - Shear wave imaging
- Lecture 50 - Recap of week 10
- Lecture 51 - RIE and DRIE
- Lecture 52 - Wet etching and Miller Indices - I
- Lecture 53 - Wet etching and Miller Indices - II
- Lecture 54 - Wet bench lab demonstration
- Lecture 55 - PCB (Printed Circuit Board)
- Lecture 56 - Ultrasonic Sensor
- Lecture 57 - Material Characterisation : STM and AFM
- Lecture 58 - Wire bonding lab demo
- Lecture 59 - Piezoelectric polymers
- Lecture 60 - Characterisation of materials - I
- Lecture 61 - Characterisation of materials - II
- Lecture 62 - Characterisation of materials - III