# UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

**SESSION: 2025-2026**

**DEPARTMENT OF CERAMIC TECHNOLOGY**

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**SUBJECT CODE:** TH-4

**NAME OF THE SUBJECT:** CERAMIC SCIENCE-II

**BRANCH:** CERAMIC TECHNOLOGY

**SEMESTER:** DIPLOMA 4th SEM

**NUMBER OF CLASS ALLOTED PER WEEK:** 3

**TOTAL PERIODS ALLOTED TO THE SUBJECT ACCORDING TO STEVT:45**

**NAME OF THE FACULTY**: KRUSHNA PRASAD DASH

| Week/Date | Lecture | Topic to be covered | Remarks |
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| 1st week 22/12/2025 To 27/12/2025 | 1st | **Chapter-1:ATOMIC STRUCTURE AND PERIODIC TABLE: -** 1.1 Discuss Atomic Structure in details. | |
| | 2nd | 1.2 Discussthe importance of the periodic table. | |
| | 3rd | 1.3 Explain electronic configuration of atoms. | |
| 2nd week 29/12/2025 To 03/01/2026 | 1st | **Chapter-2:CHEMICAL BONDING: -** 2.1 Define Chemical Bonding. | |
| | 2nd | 2.2 State and explain different types of bondslike Ionic, covalent, metallic, Vander walls and Hydrogen bond. | |
| | 3rd | 2.3 Bond energy and Bond strength. | |

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| **3rd week 05/01/2026 To 09/01/2026** | **1st** | 2.4 State and explain different physical properties based on chemical bond. | |
| | **2nd** | **Chapter-3: CRYSTALLOGRAPHY:-**<br>3.1 Define Crystal system | |
| | **3rd** | 3.2 Explain different types of crystal system | |
| **4th week 12/01/2026 To 17/01/2026** | **1st** | 3.3 Define Crystal Defect | |
| | **2nd** | 3.4 State different types of crystal defect | |
| | **3rd** | 3.5 Draw the following structure of:-<br>I. NaCl ii. CScl iii. Spinel iv. Clay v. Silicate structure | |
| **5th week 19/01/2026 To 27/01/2026** | **1st** | 3.6 Define solid solution. | |
| | **2nd** | 3.7 Explain Different types of solid solution | |
| | **3rd** | **Chapter-4:- PHASE TRANSFORMATION (Fundamental idea only):-**<br>4.1 Diffusion | |
| **6th week 02/02/2026 To 07/02/2026** | **1st** | 4.2 Fick's law of Diffusion | |
| | **2nd** | 4.3 Phase Transformation | |
| | **3rd** | 4.4 Define Nucleation and crystal growth | |
| **7th week 09/02/2026 To 13/02/2026** | **1st** | 4.5 State the role of Nucleation and grain growth in phase transformation. | |
| | **2nd** | 4.6 Stntering and vitrification | |
| | **3rd** | 4.7 Method of Sintering | |
| **8th week 16/02/2026 To 21/02/2026** | **1st** | 4.8 Factors affecting Sintering & vitrification | |
| | **2nd** | **Chapter-5:- EFFECT OF TEMPERATURE:-**<br>5.1 State the effect of temperature on Silica | |
| | **3rd** | 5.1 State the effect of temperature on Zirconia | |
| **9th week 23/02/2026 To** | **1st** | 5.1 State the effect of temperature on Magnesite and Bauxite | |

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| **27/02/2026** | **2nd** | 5.2 Describe the properties and different changes during firing of dolomite, chromite & Graphite etc. | |
| | **3rd** | 5.3 Pyro chemical changes in triaxial bodies | |
| **10th week 02/03/2026 To 07/03/2026** | **1st** | **Chapter-6: CONDUCTOR,SEMICONDUCTOR,INSULATOR AND SUPER CONDUCTOR** 6.1 Behavior | |
| | **2nd** | 6.2 Types 6.3 Mechanism | |
| | **3rd** | 6.4 Ceramic Products showing properties of conductor. | |
| **11th week 09/03/2025 To 13/03/2026** | **1st** | 6.4 Ceramic Products showing properties of semi-conductor. | |
| | **2nd** | 6.4 Ceramic Products showing properties of insulatior and super conductor. | |
| | **3rd** | **Chapter-7:- PROPERTIES OF CERAMIC MATERIAL:-** 7.1 a. Mechanical Properties | |
| **12th week 16/03/2026 To 20/03/2026** | **1st** | b. Electrical Properties | |
| | **2nd** | c. Chemical Properties | |
| | **3rd** | d. Optical Properties | |
| **13th week 23/03/2026 To 26/03/2026** | **1st** | e. Thermal Properties | |
| | **2nd** | f. Nuclear Properties | |
| | **3rd** | g. Magnetic Properties | |

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| **14th 30/03/2026 To 04/04/2026** | **1st** | 7.2 How Ceramic is different from polymer metals. | |
| | **2nd** | **Chapter-8:- MICRO STRUCTURE:-** 8.1 Define Micro Structure & its characteristics. | |
| | **3rd** | 8.2 Various technique of studying microstructure | |
| **15th week 06/04/2026 To 10/04/2026** | **1st** | 8.3 describe different type of micro scopes like: a. Mineralogical micro scope | |
| | **2nd** | 8.3 b. Electron Microscope | |
| | **3rd** | 8.4 Describe the process to prepare a specimen to study microstructure of typical ceramic materials and products. | |
| **16th week 13/04/2026 To 18/04/2026** | **1st** | 8.5 Micro Structure of various ceramic white wares and refractories products. | |
| | **2nd** | 8.6 Devlopment of microstructure in relation to sintering and control microstructure. | |
| | **3rd** | CLASS TEST | |
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