



हिमाचल प्रदेश केन्द्रीय विश्वविद्यालय

शाहपुर परिसर, जिला काँगड़ा, हिमाचल प्रदेश - 176206

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आज़ादी का
अमृत महोत्सव

F.No: CCS/1-1/PG/CUHP/2021/535

Dated: 12.11.2021

List of Inter Disciplinary Course to be offered by the Department of Chemistry and Chemical Science 1st Semester Students

S. No	Course Code	Course Name	Credit
M. Sc Chemistry 1 st Semester			
University wide Course 1 st Semester			
1.	CCS 518	Nanoscience	2
2.	CCS-520	Retrosynthetic Approach for Organic Synthesis	2


Head

Department of Chemistry and Chemical Science
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CCS520–Retrosynthetic Approach for Organic Synthesis(Credit-2)

UNIT I: Types of organic compounds and functional group transformations

Types of common functional groups in organic compounds, Emphasis on the functional group inter-conversions and preparation of conversion flowcharts, Practice of common organic conversion by taking examples of simple organic compounds (mainly the alkyl and aryl halides, alcohols, Phenols, aldehydes, ketones and carboxylic acids). Types of organic reactions such as substitution, elimination and addition elimination (basic introduction only).

UNIT-II Disconnection approach (Basic concept only)

Introduction to synthons and synthetic equivalents, importance of the order of events in organic synthesis. One group C-X and C-C disconnections only, Case studies of representative molecules are required, representative molecules for practice should include the simple organic compounds and not the complex molecules such straight chain molecules or monocyclic or bicyclic ring compounds.

CCS 518: Nanoscienc (Credit-2)

UNIT I:

Properties of Nanomaterials :Introduction: Properties of materials & nanomaterials, role of size and shape in nanomaterials.

Electronic Properties: Classification of materials: Metal, Semiconductor, Insulator, Band structures, Brillouin zones, Mobility, Resistivity.

Magnetic Properties: Superparamagnetism, blocking. Important properties in relation to nanomagnetism.

Optical Properties: Photoconductivity, Optical absorption & transmission, Photoluminescence, Fluorescence, Phosphorescence, Electroluminescence. Thermal Properties and Mechanical Properties;

UNIT II:

Synthesis of Nanomaterials :

Chemical Methods: Metal nanocrystals by reduction, Solvothermal synthesis, Photochemical synthesis, Electrochemical synthesis, Nanocrystals of semiconductors and other materials by arrested precipitation, Thermolysis routes, Sonochemical routes, Post-synthetic size-selective processing. Sol-gel, Micelles and microemulsions.

Biological Methods of Synthesis: Use of bacteria, fungi, Actinomycetes for nanoparticles synthesis, Magnetotactic bacteria for natural synthesis of magnetic nanoparticles; Mechanism of formation; Viruses as components for the formation of nanostructured materials; Synthesis process and application, Role of plants in nanoparticle synthesis.