

GPAT 2022 Syllabus:

Physical Chemistry:

1. Composition & physical states of matter

Intermolecular forces & their impact on the state of the matter. Various physical properties of matter, dipole moment, dielectric constant, Van Der Waal's equation & critical phenomenon, liquefaction of gases, aerosols.

2. Colligative Properties

The liquid state, vapor pressure, ideal & real solutions. Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular weight based on colligative properties.

3. Thermodynamics

First, second & third law of thermodynamics. Thermochemical laws, isothermic & adiabatic processes, reversible processes, work of expansion,

heat content, enthalpy, heat capacity. Gibb's & Helmholtz equation & chemical potential.

4. Refractive index

Refractive index, specific refractivity, molar refractivity, refractometers.

5. Solutions

Solubility, factors affecting solubility, solubility curves. Types of solutions, effect of co-solvency, pH & other factors on solubility. Solubility of gases in liquids, liquids in liquids, & solids in liquids, critical solution temperature, law of partitioning & its applications. Solute-solvent interactions. Expression of the concentration of pharmaceutical solutions & calculations. Molarity, molality, mole fraction & percentage expressions.

6. Electrochemistry

Properties of electrolyte solutions, electrolysis. Faraday's law of electrolysis, electron transport, electrical cell, single electrode potential, concentration cells, half-cells & half-cell potential, types of half cells, sign convention, Nernst equation, salt bridge, electromotive series, standard potential,

SHE. Measuring the relative voltage of half cells, Calculation of standard potential. Reference & indicator electrodes. Standard oxidation-reduction potential.

7. Ionic equilibrium

Theory of conductivity, equivalent conductance, mobility of ions, specific conductance.

8. Kinetics

Order of reactions, derivation & internal form of rate laws, molarities of reaction, derivation of rate constants.

Organic Chemistry:

- General principles
- Carbonyl Chemistry
- Protection & deprotection of groups
- Aromaticity & aromatic chemistry
- Different aromatic classes of compounds

- Polycyclic aromatic hydrocarbons
- Stereochemistry
- Heterocyclic Chemistry
- Bridged rings
- Kinetic & thermodynamic control
- Different classes of compounds
- Carbohydrates
- Amino acids & proteins
- Organometallic chemistry
- Pericyclic reactions

Pharmaceutical Chemistry

- Therapeutic classes of drugs
- Isotopes
- Different classes of therapeutic drugs
- Drug metabolism
- Various classes of therapeutic agents
- Pharmaceutical Impurities
- Monographs
- Different classes of therapeutic drugs

Physical Pharmacy:

- Matter, properties of matter
- Viscosity and rheology
- Dispersion systems

- Micromeritics and powder rheology
- Surface and interfacial phenomenon
- Complexation
- Buffer
- Solubility

Pharmaceutics:

- Pharmacy Profession
- Powders
- Capsules
- Kinetic Principles and Stability Testing
- Prolonged Action Pharmaceuticals
- Novel Drug delivery system
- Cosmetics
- Packaging Materials
- GMP and Validation
- Tablets
- Parenteral – product requiring sterile packaging
- ADME

- Sources of drug information
- Introduction to Pharmaceuticals
- Introduction to the dosage form
- Route of administration
- The Homeopathic system of medicine
- Biological products
- GMP
- Pharmaceutical Plant, location, layout
- Dosage Form Necessities and Additives
- Allopathic dosage form
- Crude extract
- Allergenic extract
- The Ayurvedic system of medicine
- Suspensions
- Emulsions
- Suppositories
- Semisolids
- Pharmaceutical Aerosols
- Ophthalmic preparations
- Preformulations
- Radio Pharmaceuticals
- Stability of formulated products
- The pilot plant scale-up techniques

Pharmaceutical Chemistry:

- Pharmaceutical Impurities
- Drug metabolism
- Various classes of therapeutic agents
- Different classes of therapeutic drugs
- Monographs
- Isotopes
- Therapeutic classes of drugs
- Different classes of therapeutic drugs

Biochemistry:

- Lipids
- Vitamins
- Biological oxidations & reductions
- Cell
- Carbohydrates
- Proteins
- Enzymes
- Nucleic acids
- Hereditary diseases.

Biotechnology:

- Plant Cell and Tissue Culture
- Process and Applications
- Biotechnology-Derived Products

- Proteomics
- Animal Cell Culture
- Fermentation Technology and Industrial Microbiology
- Recombinant DNA Technology
- Formulation of Proteins and Peptides

Photophysiology:

- Auto-immunity & diseases of immunity
- Neoplastic diseases
- Shock
- Biological effects of radiation
- Protein-calorie malnutrition, vitamins, obesity. starvation
- Basic principles of cell injury and adaptation
- Basic mechanisms of inflammation and repair
- Hypersensitivity

- Pathophysiology of common diseases
- Infectious diseases

