DPGU
Dnyaan Prasad Global University
Dr. D. Y. Patil Unitech Society
(Recognised by UGC & Established under Govt. of Maharashtra Act No. 20 of 2024)

Syllabus for DPAT 2026

Programmes:

1. Bachelor of Pharmacy
2. B. Pharm + MBA (Pharm. Technology)
3. Master of Pharmacy (Pharmaceutics)
4. Master of Pharmacy (Pharmacology)
5. Master of Pharmacy (Pharmaceutical Quality Assurance)
6. Master of Science (Pharmaceutical Analysis)
7. Doctor of Pharmacy - Pharm. D.
8. Doctor of Pharmacy- Post Baccalaureate

Physics Syllabus

- **Scalar Quantities and Vector Quantities**
  Force: Centripetal Force, Centrifugal Force, Moment of Force, Equilibrium
  Fraction in Solids and Liquids: Kinetic, Static
- **Refraction of Light, Seed of Light in Different Medium:** Refraction Laws, Snell's Law, Absolute Refraction Index, Angle of Refraction, Internal Refraction, Optical Fibre, Convex Lens
- **Magnetic Effect of Electric Current:** Magnetism, Attractive Property, Directive Properties, Intensity
- **Motion:** Motion, Circular Motion, Wave Motion, Rotational Motion, Uniform Speed
- **Gravitation:** Value of G, Gravitational Force and Weight
- **Oscillations:** Simple Harmonic Motion
- **Elasticity:** Elastic Limit or Maximum Value of Deforming Force, Stress, Strain, Hooke's Law
- **Surface Tension:** Cohesive Force, Adhesive Force, Capillarity, Illustrations
- **Stationary Waves:** Wave Theory and Formulas
  Kinetic Theory
  Interference and Diffractions
- **Electrostatics and Current Electricity:** Magnetic Effects of Electric Current, Electromagnetic Inductions
  Magnetism

Electrons and Photons, Atoms, Molecules, and Nuclei
Semiconductors
Communication Systems

Chemistry Syllabus

- **Ionic Equilibria:** Acids, bases, pH scale and buffer solutions.
- **Electrochemistry:** Redox reactions, conductance, electrochemical cells, Nernst equation, and Kohlrausch's law.
- **Chemical Kinetics:** Rate of reaction, order, molecularity, activation energy and Arrhenius equation.
- **Transition and Inner Transition Elements:** d-block and f-block properties, oxidation states and reactions of $KMnO_4$ and $K_2Cr_2O_7$.
- **Alcohols, Phenols, and Ethers:** Classification, preparation, physical properties and specific reactions.
- **Aldehydes, Ketones, and Carboxylic Acids:** Prepartion, Carbonyl reactions and name reactions.
- **Polymer Chemistry:** Classification and polymerization reactions.
- **Green Chemistry and Nanochemistry:** Principles of green chemistry and nano-materials.

Biology Syllabus

Syllabus Of 11TH Biology for DPAT 2026

Section I - Botany
Unit 1 Diversity in Living World:
Chapter 1- Diversity in organisms :

1. Diversity in living organisms-Brief idea.
2. Systematic and binomial system of nomenclature - meaning of the terms taxonomy, systematics, classification and nomenclature, Need of classification**.** **Three domains of life, Concept of species.** Taxonomic hierarchy with examples. Binomial nomenclature explanation, significance and examples.

Classification of living organisms (five Kingdom classification) – Major groups and principles of classification for each Kingdom with examples.

3. Lichens - Meaning, characters, examples and importance.
4. Viruses and viroids - Definitions, characters, types with examples, Economic importance and list of viral diseases.

Chapter 2 - Kingdom Plantae :

1. Salient features of major plant groups - Algae, Bryophyta, Pteridophyta, Gymnosperms and Angiosperms (Dicotyledons and Monocotyledons). Three to

five salient features and two examples of each category.

2. Botanical gardens and herbaria - Meaning,

Unit 2 Structure and function of cell :

Chapter 3 - Biochemistry of cell :

1. Basic chemical constituents of living bodies.
2. Structure and function of carbohydrates, proteins, lipids and nucleic acids in brief.
3. Enzymes - Definition, **Types,** general properties**, Enzyme action** and factors

Chapter 4

Cell Division

Cell cycle

Mitosis

Meiosis

Unit 3 Structural organization in plants

Chapter 5 - Morphology of Plants :

1. Morphology, anatomy and functions of different parts - Root, stem, leaf, inflorescence, flower, fruit and seed. **(To be dealt along with the relevant practicals of the practical syllabus)**
2. Plant tissues.

Unit 4

Plant Physiology Chapter 6 - Plant Water Relations and Mineral Nutrition : 1. Movement of water, food, nutrients and gases - Absorption of water and minerals,Apoplast and Symplast Pathways. Active and passive absorption in brief. 2. Guttation Ascent of sap, root pressure concept and cohesion - tension theory. Translocation of sugars through phloem brief account. Transpiration – structure of stomata, mechanism of opening and closing of stomata, Role of K+ ions 3. Role of water and minerals macronutrients and micronutrients and their role. Mineral deficiency symptoms, Mineral toxicity, Elementary idea of Hydroponics, Nitrogen Metabolism (nitrogen cycle, biological nitrogen fixation)

Chapter 7 - Plant Growth and Development: Seed dormancy Germination - Hypogeal, epigeal and viviparous. Definition and characteristics of growth. Phases of growth, Conditions of growth, Differentiation, de- differentiation, Sequence of developmental process in a plant cell Growth regulators - auxins, gibberellins, cytokinines, ethylene and abscissic acid (role in brief) Photoperiodism, Photomorphogenesis including brief account of Phytochromes (Elementary idea) Vernalization.

Std. - XI

Section II – Zoology

Unit 1 Diversity in Living World

Chapter 8 - Kingdom Animalia

1. Salient features of major phyla under kingdom Animalia. Classification of

following phyla with three to five salient features and two examples of each category: Porifera, co elenterata ctenophora, Platyhelminthes, Nemathel-minthes, Annelida, Arthropoda, Mollusca, Echinodermata and Hemichordata. Classification of phylum chordata upto class level with three to five salient features and two examples of each category: Urochordata, Cephalochordata, Cyclostomata, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves and Mammalia.

2. Zoological parks and Museums - General idea with list.

Unit 2 Structure and function of cell

Chapter 9 - Organization of Cell

1. Cell theory - brief account
2. Prokaryotic and eukaryotic cell - structure and examples.
3. Plant cell and animal cell.
4. Nuclear organization - Nucleus, nucleolus and nucleoplasm.
5. Cell wall and cell membrane - (fluid mosaic model).
6. Cell organelles: Plastids,
7. Mitochondria,Golgi complex, Lysosomes, Endoplasmic reticulum, Vacuoles, Ribosome and Centrioles **(ultrstructure and functions).** Microbodies, cytoskeleton, cilia and flagella.

Unit 3 Structural organization in Animals:

Chapter 10- Study of Animal Tissues :

1. **Animal tissues - types**
   a) Epithelial tissues - simple epithelium (squamous, cuboidal, columnar, Ciliated, glandular). - compound epithelium (stratified).
   b) Connective tissue - (Areolar, Adipose, Tendons, Ligaments, Cartilage and Bone).
   c) Muscular tissue - (Smooth, striated and cardiac).
   d) Nervous tissue (Neurons, glial cells and types of neurons).

Chapter 11- Study of Animal Type

1. Morphology, anatomy and functions of digestive, **circulatory, respiratory,** nervous, **and reproductive** systems of cockroach **(Brief account only)**

Unit 4 Human Physiology

Chapter 12- Human Nutrition

i) Digestive system in brief

ii) Physiology of digestion, **gastrointestinal hormones, Peristalsis. Calorific value of proteins, carbohydrates and fats**

iii) Absorption, assimilation **and egestion**

iv) Nutritional and digestive disorders – PEM, indigestion, constipation, Jaundice, **vomiting and diarrhoea**

Chapter 13- Human Respiration Respiratory organs in animals (Recall only)

i) Respiratory system in brief

ii) Breathing- inspiration and expiration.

iii) Exchange of gases, transport of CO2 and O2 and tissue respiration. **Regulation of Respiration, Respiratory volumes.**

iv) Respiratory disorders- Asthma, **Emphysema** and occupational lung diseases.

Chapter 14 - Human skeleton and Locomotion:

Brief account of human skeleton: A] Axial Skeleton

B] Appendicular Skeleton

(Details to be dealt with the relevant practical)

Types of joints - synarthroses, amphiarthroses, and diarthroses.

Types of diarthroses - ball and socket, hinge, condyloid, pivot, saddle and gliding joints.

Types of Movement- Ciliary, Flagellar, Muscular

Mechanism of muscle movement: **Contractile proteins and Muscle contraction.** Skeletal and muscular disorders **– Myasthenia gravis**, Osteoporosis, arthritis, muscular dystrophy tetany and **gout.**

Std. XI - Biology Practicals Syllabus

(A) List of experiments:

1. Study of parts of compound microscope.
2. **Preparation of T. S. of dicot (sunflower) and monocot roots and stem** to study different plant tissues.
3. Study and describe three locally available flowering plants from the families- Solanaceae, Fabaceae and Liliaceae with respect to types of root-(tap and adventitious), stem (herbaceous and woody), leaf (arrangement, shape, venation, simple and compound) and floral characters.Study of plasmolysis in epidermal peels.
4. Study of osmosis by Potato osmometer
5. Study of structure and distribution of stomata in upper and lower surface of leaf.
6. To test the presence of sugar, starch, proteins and fats from suitable plant and animal materials.
7. To study the digestion of starch by salivary amylase under different conditions of temperature and pH.

(B) Study/ Observation of the following (Spotting):

1. Study of specimens and identification with reasons: **Bacteria, *Amoeba,*** *Oscillatoria, Spirogyra, Rhizopus,* yeast, *Agaricus, Usnea, Riccia, Funaria, Nephrolepis*, ***Cycas,*** sunflower and maize.
2. Comparative study of rates of transpiration in upper and lower surface of leaf.
3. Study of different modifications of root (fusiform root, parasitic root, epiphytic root and pneumatophores).
4. Study of different modifications of stem (stem tuber, runner, and tendril).

5. Study of different modifications of leaf (leaflet and stipular tendril), leaf Spines, phyllode).
6. Study of imbibition of seeds/raisins.
7. Study and identification of different types of inflorescence.
8. **Study of tissues and diversity in shapes and sizes of plant and animal cells- palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem, squamous epithelium, muscle fibres, mammalian blood smear, through temporary or permanent slides.**
9. Observation and comments on experimental set up on:
   a) Phototropism
   b) Suction due to transpiration.
   c) Apical bud removal
10. Study of specimens and their identification with reasons – *Sycon, Hydra*, Pleurobrachia Liverfluke*, Ascaris*, Leech, Earthworm, **Prawn, Silkworm, Honey bee** , Snail, Star-fish, *Balanoglossus*, Shark, Rohu, Frog, Lizard, Pigeon and Rat.
11. Study of human skeleton (except skull, hand bones and foot bones) and **different types of joints (synovial, cartilaginous and fibrous joints with one suitable example).**
12. Study of external morphology of earthworm, cockroach and frog through models.
13. **Study of mitosis** in onion root tips and animal cells (**grasshopper)** from permanent slides.

Syllabus Of 12TH Biology for DPAT 2026

Std. - XII Biology

Section I – BOTANY

Unit 1: Genetics and Evolution :

Chapter 1 - Genetic Basis of Inheritance: Mendelian inheritance. Deviations from Mendelian ratio (gene interaction-incomplete dominance, co-dominance, multiple alleles **and Inheritance of blood groups), Pleiotropy, Elementary idea of polygenic inheritance.**

Chapter 2 - Gene: its nature, expression and regulation:

Modern concept of gene in brief-cistron, muton and recon. **DNA as genetic material**, structure of DNA as given by Watson and Crick's model, **DNA Packaging**, semi conservative replication of eukaryotic DNA.

RNA: General structure, types and functions.

Protein Synthesis; central dogma, Transcription; Translation-Genetic Code, Gene Expression and Gene Regulation (The *Lac* operon as a typical model of gene regulation).

Unit 2: Biotechnology and its application:

Chapter 3 - Biotechnology: Process and Application :

Genetic engineering (Recombinant DNA technology):
Transposons, Plasmids, Bacteriophages; Producing Restriction Fragments, Preparing and cloning a DNA Library, Gene Amplification (PCR).
Application of Biotechnology in Agriculture – BT crops
Biosafety Issues (Biopiracy and patents)

Unit 3: Biology and Human Welfare :

Chapter 4 - Enhancement in Food Production
Plant Breeding
Tissue Culture: Concept of Cellular Totipotency,
Requirements of Tissue Culture (in brief), Callus Culture, Suspension Culture.
Single Cell Protein. **Biofortification.**

Chapter 5 - Microbes in Human Welfare: Microbes in Household food processing.
Microbes in Industrial Production.
Microbes in Sewage Treatment. Microbes in Biogas (energy) Production. Microbes as Biocontrol Agents.
Microbes as Biofertilizers.

Unit 4: Plant Physiology :

Chapter 6 - Photosynthesis Autotrophic nutrition
Site of Photosynthesis
Photosynthetic Pigments and their role. Light-Dependent Reactions (Cyclic and non-cyclic photophosphorylation)
Light-Independent Reactions (C3 and C4 Pathways)
Chemiosmotic hypothesis, Photores-piration, Factors affecting Photosynthesis.
Law of limiting factors.

Chapter 7 - Respiration

ATP as currency of Energy
Mechanism of Aerobic (Glycolysis, **TCA Cycle and Electron Transport System**) and Anaerobic Respiration**. Fermentation** Exchange of gases
Amphibolic pathway. Respiratory quotient of Nutrients.
Significance of Respiration.

Unit 5: Reproduction in Organisms :

Chapter 8 - Reproduction in Plants

Modes of Reproduction (Asexual and Sexual).
Asexual reproduction; uniparental modes-vegetative propagation, micropropagation
Sexual Reproduction: **structure of flower** Development of male gametophyte,
Structure of anatropous ovule.
Development of female Gametophyte. Pollination: Types and Agencies.
Outbreeding devices; pollen-pistil interaction.
Double Fertilization: Process and Significance.

Post-fertilization changes (development of endosperm and embryo, development of seed and formation of fruit)
Special modes-apomixis, parthenocarpy, polyembryony. Significance of seed and fruit formation.

Unit 6: Ecology and Environment

Chapter 9: Organisms and Environment -I : Habitat and Niche

Ecosystems: Patterns, components, productivity and decomposition, energy flow; pyramids of number, biomass, energy; nutrient cycling (carbon and phosphorous).
Ecological succession, Ecological services-carbon fixation, pollination, oxygen release. Environmental issues: agrochemicals and their effects, solid waste management, Green house effect and global warming, ozone depletion, deforestation, case studies (any two).

Std. - XII Biology

Section II - ZOOLOGY

Unit 1: Genetics and Evolution : Chapter 10 - Origin and the Evolution of Life :
Origin of Life: Early Earth, Spontaneous, assembly of organic compounds,
Evolution: Darwin's contribution, Modern Synthetic Theory of evolution, Biological Evidences, **Mechanism of evolution; Gene flow and genetic drift;Hardy-Weinberg principle; Adaptive radiation.** Origin and Evolution of Human being.

Chapter 11 - Chromosomal Basis of Inheritance

The Chromosomal Theory. Chromosomes.
Linkage and Crossing Over.
Sex-linked Inheritance (Haemophilia and colour blindness)
Sex Determination in Human being, birds, honey bee.Mendelian disorders in humans-Thalassemia. Chromosomal disorders in human: Down's syndrome, Turner's syndrome and Klinfelter's syndrome.

Unit 2: Biotechnology and its application: Chapter 12- Genetic Engineering and Genomics

DNA Finger Printing.
Genomics and Human Genome Project. Biotechnological Applications in Health: Human insulin and vaccine production, Gene Therapy. **Transgenic animals.**

Unit 3: Biology and Human Welfare

Chapter 13- Human Health and Diseases Concepts of Immunology: Immunity Types, **Vaccines,**
Structure of Antibody, Antigen-Antibody Complex, Antigens on blood cells.
Pathogens and Parasites (Amoebiasis, Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, Common cold and ring worm). Adolescence, drug and alcohol abuse. Cancer and AIDS.

Chapter 14- Animal Husbandry Management of Farms and Farm Animals. Dairy. Poultry.
Animal Breeding. Bee-Keeping.

Fisheries. Sericulture Lac culture

Unit 4: Human Physiology :

Chapter 15- Circulation

Blood composition and coagulation, **Blood groups.**

Structure and pumping action of Heart. Blood Vessels.

Pulmonary and Systemic Circulation. Heart beat and Pulse. Rhythmicity of Heart beat. **Cardiac output**, **Regulation of cardiac activity.**

Blood related disorders: Hypertension, coronary artery disease, angina pectoris, and heart failure.

ECG, Lymphatic System (Brief idea): **Composition of lymph and its functions.**

Chapter 16- Excretion and osmoregulation Modes of excretion- Ammonotelism,

ureotelism, uricotelism. Excretory System.

Composition and formation of urine.

Role of Kidney in Osmoregulation. Regulation of kidney function: renin-angiotensin, atrial natriuretic factor, ADH and Diabetes inspidus, role of other organs in excretion.

Disorders**;** Kidney failure, Dialysis, Kidney stone (renal calculi). Transplantation. **Uraemia, nephritis.**

Chapter 17- Control and Co-ordination

Nervous System

Structure and functions of brain and Spinal cord, brief idea about PNS and ANS. Transmission of nerve impulse. Reflex action.

Sensory receptors (eye and ear), **Sensory perception, general idea of other sense organs.**

Endocrine System Endocrine glands

Hormones and their functions **Mechanism of hormone action.** Hormones as messengers and regulators. Hormonal imbalance and disease

Chapter 18- Human Reproduction Reproductive system in male and female.

Histology of testis and ovary.

Reproductive cycle.

Production of gametes, fertilization, implantation.

Embryo development up to three germinal layers.

Pregnancy, placenta, parturition and **lactation** (Elementary idea).Reproductive health-birth control, Contraception and sexually transmitted diseases.**MTP, Amniocentesis; Infertility and assisted reproductive technologies-IVF, ZIFT, GIFT (elementary idea for general awareness)**