

AMBT16 DEVELOPMENTAL BIOLOGY

UNIT-1 HISTORY & BASIC CONCEPTS

The origins of developmental biology, Concepts in development – Developmental signals in cell division & differentiation, Role of gene expression in development, Identifying developmental genes, Cell commitment & differentiation, Determination & induction of cell fate, Concept of morphogen & positional information.

UNIT-2 AN INTRODUCTION TO MODEL SYSTEMS

Model vertebrate organisms: *X. laevis*, Chicken, Mouse, Zebrafish, Model invertebrate organisms: *D. melanogaster*, *C. elegans*, Model plant: *A. thaliana*

UNIT-3 GERM CELLS & SEX

Genotypic & phenotypic sex-determination in mammals, *D. melanogaster* and *C. elegans*, Structure & Formation of germ cells, Fertilization

UNIT-4 PATTERNING THE VERTEBRATE BODY PLAN

Axes & Germ Layers, Setting up the body axes, The origin & specification of the germ layers, The Mesoderm & Early Nervous System, Somite formation & Patterning, Role of the organizer region & neural induction

UNIT-5 DEVELOPMENT OF THE DROSOPHILA

Body Plan, Specification of body axes & role of maternal genes, Polarization of body axes during oogenesis, Patterning of early embryo & role of zygotic genes, Segmentation & role of pair-rule genes, Compartments & role of segment polarity genes, Selector & Homeotic genes

UNIT-6 DEVELOPMENT OF NEMATODES & CELLULAR SLIME MOLDS

Developmental axes determination in *C. elegans*, Cell-fate specification in *C. elegans*, Larval development in *C. elegans*, Vulva development in *C. elegans*, Patterning of the slug in slime mold, Cell differentiation in slime mold, Aggregation

UNIT-7 MORPHOGENESIS

Kinds of cleavage & blastulation, Types of tissue movement in gastrulation, Gastrulation in amphibians & mammals, Neural tube formation & neural crest migration

UNIT-8 CELL DIFFERENTIATION & ORGANOGENESIS

Models of cell differentiation, Insect imaginal disc & wing development

UNIT-9 MOLTING & METAMORPHOSIS

Amphibian metamorphosis, Insect metamorphosis

UNIT-10 PLANT DEVELOPMENT

Pattern development in early embryogenesis of angiosperms, Floral development

Reference Book

1. Developmental Biology, by Scott F. Gilbert (1997), Sinauer Associates, Inc.

