DAV PUBLIC SCHOOL UPPAL'S SOUTHEND SECTOR 49, GURGAON

ACADEMIC PLAN

CLASS XII BIOLOGY (THEORY)

Time: 3 Hours **M.M. 70**

	Title	No. of Periods	Marks
VI	Reproduction in Organisms	30	14
VII	Genetics & Evolution	40	18
VIII	Biology And Human Welfare	30	14
IX	Biotechnology and its Applications	30	10
X	Ecology and Environment	30	14
	Total	160	70

The prescribed syllabus is expected to:

- Promote understanding of basic principles of Biology
- Encourage learning of emerging knowledge and its relevance to individual and society
- Promote rational/scientific attitude towards issues related to population, environment and development
- Enhance awareness about environmental issues, problems and their appropriate solutions
- Create awareness amongst the learners about diversity in the living organisms and developing respect for other living beings
- Appreciate that the most complex biological phenomena are built on essentially simple processes

It is expected that the students would get an exposure to various branches of Biology in the syllabus in a more contextual and friendly manner as they study its various units.

MARCH

Unit-VI REPRODUCTION IN ORGANISMS

Chapter-1: Reproduction in organisms (7 periods)

Chapter-1: Reproduction in Organisms

Reproduction, a characteristic feature of all organisms for continuation of species; modes of reproduction - asexual and sexual reproduction; asexual reproduction - binary fission, sporulation, budding, gemmule formation, fragmentation; vegetative propagation in plants.

WEB LINKS:-

http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/A/AsexualReproduction.html

http://www.saburchill.com/ans02/chapters/chap049.html

Chapter-2: Sexual Reproduction in Flowering Plants (8 periods)

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; out breeding devices; pollen-pistil interaction; double fertilization; post fertilization events-development of endosperm and embryo, development of seed and formation of fruit; special modes-apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

WEB LINKS:-

http://scidiv.bellevuecollege.edu/rkr/biology213/labs/pdfs/ReproductionDevelopment.pdf

http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/A/Angiosperm.html CHAPTER

APRIL

Chapter-3: Human Reproduction (8 periods)

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis -spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

WEB LINKS:-

http://www.biology.iupui.edu/biocourses/N100/2k4ch39repronotes.html

http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/S/Sexual_Reproduction.html

Chapter-4: Reproductive Health (5 periods)

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies-IVF, ZIFT, GIFT (elementary idea for general awareness).

WEB LINKS:-

http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_stu den ts/RH_HSS_final.pdf

Unit-VII GENETICS AND EVOLUTION

Chapter-5: Principles of Inheritance and Variation (17 periods)

Heredity and variation: Mendelian inheritance; deviations from Mendelism - incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in humans, birds and honey bee; linkage and crossing over; sex linked inheritance- haemophilia, colour blindness; Mendelian disorders in humans: thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

WEB LINKS:-

http://www.ndsu.edu/pubweb/~mcclean/plsc431/mendel/mendel1.htm

Chapter-6: Molecular Basis of Inheritance (15 periods)

Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; genome and human and rice genome projects; DNA fingerprinting.

WEB LINKS:-

http://www.easternbiotech.com/Molecular-Basis-of-Genetics.php http://highered.mcgraw-

hill.com/sites/0072437316/student_view0/chapter14/animations.html

http://www.csun.edu/~cmalone/pdf360/Ch10-1%20Gen%20material.pdf

http://www.visionlearning.com/library/module_viewer.php?mid=149

http://www.bioscience.org/atlases/genecode/genecode.htm

MAY

Chapter-7: Evolution (16 periods)

Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution - variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy - Weinberg's principle; adaptive radiation; human evolution.

WEB LINKS:-

http://bioweb.cs.earlham.edu/9-12/evolution/HTML/theory.html http://brembs.net/gould.html

http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/H/Hardy_Weinberg.html

JULY

Unit-VIII BIOLOGY IN HUMAN WELFARE

Chapter-8: Human Health and Diseases (10 periods)

Pathogens; parasites causing human diseases (malaria, dengue, chickengunia, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

WEB LINKS: -

http://nvsrochd.gov.in/S_club/Biology/Human_Health_and_Diseases.pdf

http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001620/

http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002267/

http://www.medicalnewstoday.com/info/cancer-oncology/

http://www.ext.colostate.edu/pubs/consumer/10216.html

http://uhaweb.hartford.edu/bugl/immune.htm

Chapter-9: Strategies for Enhancement in Food Production (9 periods)

Improvement in food production: Plant breeding, tissue culture, single cell protein, Biofortification, Apiculture and Animal husbandry.

WEB LINKS:-

http://agritech.tnau.ac.in/crop_improvement/crop_imprv_breeding_methods.html

http://members.tripod.com/~Marge_S_2/nonframes/inbreeding.htm

Chapter-10: Microbes in Human Welfare (7 periods)

Household food processing, industrial production, sewage treatment, energy generation and microbes as biocontrol agents and biofertilizers. Antibiotics; production and judicious use.

WEB LINKS:-

http://www.actionbioscience.org/evolution/meade_callahan.html

http://www.beyondbooks.com/lif72/2b.asp http://www.euwfd.com/html/sewage_treatment.html

AUGUST

Unit-IX BIOTECHNOLOGY AND ITS APPLICATIONS

Chapter-11: Biotechnology - Principles and processes (8 periods)

Genetic Engineering (Recombinant DNA Technology).

WEB LINKS:-

http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/R/RestrictionEnzymes.html

http://www.bio.davidson.edu/Courses/Molbio/MolStudents/spring2003/McDonald/Gene_gun.html

http://dwb4.unl.edu/Chem/CHEM869N/CHEM869NLinks/waksman.rutgers.edu/7Esofer/1999DNARevolution/Class12-2.html

http://www.eplantscience.com/index_files/biotech_tools_genetic_engineering.php

Chapter-12: Biotechnology and its Application (8 periods)

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, bio piracy and patents.

WEB LINKS:-

http://www.bt.ucsd.edu/bt_crop.html

http://www.ces.ncsu.edu/depts/foodsci/ext/pubs/bioapp.html

http://www.nobelprize.org/educational/medicine/insulin/discovery-insulin.html

http://www.littletree.com.au/dna.htmhttp://ghr.nlm.nih.gov/condition/adenosine-deaminase-deficiency http://learn.genetics.utah.edu/content/disorders/whataregd/ada/ UNIT]

Unit-XEcology and Environment

Chapter-16: Environmental Issues (6 periods)

Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change; ozone layer depletion; deforestation; any one case study as success story addressing environmental issue(s).

WEB LINKS:-

http://arcatamarshfriends.org/ http://www.buzzle.com/articles/air-pollution-control-equipment-systems.html http://cpcb.nic.in/upload/NewItems/NewItem_104_airquality17cities-package-.pdf

SEPTEMBER

REVISION AND FIRST TERM EXAMINATION

OCTOBER

Unit-XEcology and Environment (8 periods)

Chapter-13: Organisms and Populations

Organisms and environment: Habitat and niche, population and ecological adaptations;

population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution.

WEB LINKS:-

http://kentsimmons.uwinnipeg.ca/ysesp/comeco3.htm

Chapter-14: Ecosystem (8 periods)

Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services - carbon fixation, pollination, seed dispersal, oxygen release (in brief).

WEB LINKS:-

http://www.sci.sdsu.edu/classes/bio100/Lectures/Lect22/lect22.htmlhttp://www.biog1105-1106.org/demos/106/unit10/media/5b.succession.pdf

NOVEMBER

Chapter-15: Biodiversity and its Conservation (8 periods)

Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries.

WEB LINKS:-

http://edugreen.teri.res.in/explore/life/what.htm

http://www.globalissues.org/issue/169/biodiversity

http://www.ugc.ac.in/policy/env/Chapter4.pdf

DECEMBER/JANUARY

REVISION AND EXAMINATION

PRACTICALS

Time allowed: 3 Hours **Max. Marks: 30**

Evaluation Scheme	
One Major Experiment Marks	5
One Minor Experiment Marks	4
Slide Preparation Marks	5
Spotting Marks	7
Practical Record + Viva Voce Marks	4
Project Record + Viva Voce Marks	5
Total Marks	**30**

A.	**List of Experiments**
1.	Study pollen germination on a slide.
2.	Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them.
3.	Collect water from two different water bodies around you and study them for pH, clarity & presence of any living organism.
4.	Study the presence of suspended particulate matter in air at two widely different sites.
5.	Study the plant population density by quadrat method.
6.	Study the plant population frequency by quadrat method.
7.	Prepare a temporary mount of onion root tip to study mitosis.
8.	Study the effect of different temperatures and three different pH on the activity of salivary amylase on starch.
9.	Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.
B.	**Study/observation of the following (Spotting)**
1.	Flowers adapted to pollination by different agencies (wind, insects, birds).
2.	Pollen germination on stigma through a permanent slide.
3.	Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).

4.	Meiosis in onion bud cell or grasshopper testis through permanent slides.
5.	T.S. of blastula through permanent slides (Mammalian).
6.	Mendelian inheritance using seeds of different colour/sizes of any plant.
7.	Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, earlobes, widow's peak and colour blindness.
8.	Controlled pollination - emasculation, tagging and bagging.
9.	Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, Roundworm through permanent slides or specimens. Comment on symptoms of diseases that they cause.
10.	Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.
11.	Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.