### (For The Candidates Admitted From 2016 Onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI – 2

COURSE CONTENT AND SCHEME OF EXAMINATIONS

PG AND RESEARCH DEPARTMENT OF BIOTECHNOLOGY AND BIOINFORMATICS

M.Phil BIOTECHNOLOGY

COURSE CONTENT AND SCHEME OF EXAMINATIONS

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Title of the Paper</th>
<th>Code</th>
<th>Hrs/Week</th>
<th>Credit</th>
<th>Marks</th>
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<tr>
<td>I</td>
<td>Major Core 1</td>
<td>Research Methodology-techniques and their application</td>
<td>MPH15BT1C01</td>
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<td>I</td>
<td>Major Core 2</td>
<td>Applied Biotechnology</td>
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<td>Major Core 3</td>
<td>Principles and Practice of Technological Biotechnology</td>
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<td>II</td>
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UNIT-I

**Colorimetry**- Principle, working and applications of redox and pH-meter, buffers, estimation of macro molecules (protein, carbohydrate and nucleic acids), enzyme kinetics.

**Spectrophotometry**- ultraviolet and visible - principle, instrumentation and application of spectrophotometers.

**X-ray Diffraction**:- Structure factor expression, electron density equation, phase problems, Patterson function, molecular replacement method, heavy atom method, isomorphous replacement method, refinement procedure and interpretation of results. Fiber X-ray diffraction studies, single crystal X-ray diffraction studies and NMR studies on mono and oligonucleotides. Methods of data collection of crystal containing small molecule and large molecule, factors affecting the measurement of integrated intensities, photographic methods, diffractometers, area detectors and image plates.

UNIT -II

**Different types of microscopic techniques**- selection of suitable samples, and observation in different systems, study of living cells (light microscope, compound microscope, dark field microscope, phase contrast microscope, Normaski microscope, confocal microscopy, transmission electron microscopy (TEM) and scanning electron microscopy (SEM), atomic force microscopy (AFM), Cell sorting-flow cytometry

UNIT -III

**Centrifugation**- Types of rotors. Principles, instrumentation and applications of types of centrifugation techniques

**Chromatography**- techniques and principles and different types (Affinity chromatography, ion exchange chromatography, Gel exclusion chromatography, Gas chromatography, HPLC, TLC, paper chromatography). Isolation of natural products (extraction, purification and separation).
UNIT- IV

**Electrophoresis**- Principle and instrumentation of Agarose and Polyacrylamide Gel Electrophoresis (Native & SDS-PAGE). 2D gel electrophoresis.


**Immunological Methods**- Production of antibodies from laboratory animals, monoclonal antibodies. Routes of immunization, types of adjuvant and their importance, antigen antibody interaction, monoclonal and polyclonal antibodies. RIA & ELISA techniques-principle and applications, Immuno-radiometric assay- Principles and applications, Hybridoma.

UNIT-V

**Statistics in biomedical research**- Experimental design, Various sampling methods, Probability, frequency distribution average (arithmetic, geometric, means, mode and median) Standard Deviation, Standard Error of Mean, Degree of Freedom, Significance, ttest, Correlation, null hypothesis, distribution. Use of computers in data analysis.

**REFERENCE BOOKS:**


UNIT I

Microbiology - Microbial growth Physiology- Overview of Basic Metabolism & Microbial Nutrition- reproduction in microbes- Applications of microbes- Biodegradation. Microbial Diseases & Chemotherapy/ Antibiotics.


UNIT II


Plant Biotechnology- Techniques in Plant tissue Culture - Tools in producing Transgenic plants and their preservation Gene Cloning -Transgenic plants in Agriculture & Industry- Plant Breeder’s Right(PBR) and Farmer’s Rights. Gene transfer techniques.

UNIT III

Recombinant DNA Technology- Molecular tools and their application- Gene amplification and its application. Construction of c-DNA and genomic DNA libraries, expression of cloned gene,


**UNIT VI**


**UNIT V**

**Patenting and IPR in Biotechnology** -IPR in the global economy , in international trade; Biodiversity related global IPR regime , TRIPS agreement, objectives and general principles, patents, trade secrets, UPOV convention; IPR and Biodiversity , sustainable use, Plant variety rights, Rights of traditional knowledge holders, the CBD, WTO, UNCTAD biotrade initiatives, government and regional initiatives, non-governmental initiated community intellectual rights, SRISTIs local innovations databases, peoples biodiversity register; Unsolved questions

**REFERENCE BOOK**
New York.
UNIT I: Communication skills

Type of communication


c. Life Science communication: approaches – delivery – content

UNIT II: Reaching Skills

a) Teaching objectives: Taxonomy of education objectives – Writing teaching objectives – importance of objectives.

b) Planning teaching: Content analysis – identification of appropriate subject materials – organization.

c) Teaching methods: appropriate teaching strategies – teaching aids.

d) Motivation: Need for motivation – Herzberg’s theory – Maslow’s theory.

UNIT III: Computer application skills (Lab Work)

a) MS Word: Preparation of word document.

b) MS Excel: Data entry, basic calculations and chart preparation.

c) MS Power Point: Preparation and presentation.

d) MS Paint: Drawing and editing a picture.

e) Photoshop (Adobe)

UNIT IV: Data Banks and Retrieval of information (Lab Work)

a) Internet: Browsing and saving web content

b) Protein-SWISS-PROT, PIR

c) Genome-EMBL, Genbank information resources
d) Structural databases and sequence alignment

e) e- Journal

UNIT V: Analysis of data with SPSS (Lab. Work)

a) Data entry and computation of descriptive and dispersion, correlation and regression co-efficient
b) Hypothesis testing with ‘t’ test and ANOVA, Interpretation and presentation of data.
c) Comparison of mean-single and paired ‘t’ test.

REFERENCE BOOKS:

OBJECTIVES
Provide a broad and thorough background in modeling tools and docking program. To understand the theories used to build tools and their relationship and basic concepts involved in drug designing.

UNIT I

UNIT II

UNIT III
Molecular Docking – principle – Types of docking – Ligand design – structure based ligand design – 3D database searching and de nova ligand design (outside in and inside out methods) using Discovery studio.

UNIT IV
Structure Based Design Methods-Structure based design methods to design novel inhibitors – QSAR using TSAR and its importance –Virtual Screening and ADMET properties using ACCORD Excel. Software tools for modeling bio-molecules.
UNIT V:

Immunoinformatics


REFERENCES
11. Immunoinforamtics by Novartis Foundation-Wiley Publication
Holy Cross College is located at Tejkuny Para Tejgaon Dhaka. Its EIIN is 131962 and phone no. is . It was....Â Want to get update about Holy Cross College? Subscribe now. We will send update to your email and mobile. Get detailed information about Holy Cross Home Science College Courses, Fees, Faculty, Infrastructure & Contact Details.Â Apply for BA in Manav Rachna International Institute of Research and Studies, Faridabad. NAAC A grade accredited University | Among Top University by NIRF | 100% Merit Based Scholarship. Fees : 3,78,000.Â Also Viewed with Holy Cross Home Science College. 8 Photos 2 Videos. 4.2/5. Holy Cross College is an autonomous women's college located in Tiruchirappalli, Tamil Nadu, India. It has been recognized as the 'College with Potential for Excellence (CPE)' by the University Grants Commission. The college is ranked 66th among the colleges in India in the National Institutional Ranking Framework (NIRF) ranking of 2020. Holy Cross College was established in 1923 by the 'Sisters of the Cross of Chavanado', Province of Trichy. It became a second-grade college in 1928 and postgraduate Holy cross institute of management and technology is one of the major college under Calicut university. Best college for commerce and management.Â Welcome to Holy Cross College Calicut. We uphold the value of each member of our human community, recognizing the dignity and distinctive nature of each individual. An Institution wholly owned and managed by the International Congregation of Sisters of Mercy of the Holy Cross where the motto of the order is "The need of the time is the will of God". MORE. Educational Policy. Inspired by the life, teachings and liberating love of Jesus who came to give life to all in its fullness and His call to spread the Good News of love, peace, justice and fraternity to all nations. MORE. Our Cour...Â Our Courses.