Ramakrishna Mission Vidyamandira
Belur Math, Howrah - 711 202

Summer Internship 2026

Internship Supervisor : Dr Gopal Chandra Bayen **Department of Bengali** **Ramakrishna Mission Vidyamandira**
Title : Bangla Chhandagyan O Abritti Shilpa **(Internship Code : BNGGCB1)**
Prerequisite: Primary knowledge in Bangla Chhanda
Mode : **Online** (both Males & Females can apply)
Abstract and Internship Outcome:: Participants will learn the technique(s) of Abritti. They will learn the basic elements of Bangla chhanda.

Internship Supervisor : Sri. Milan Singha **Department of Bengali** **Ramakrishna Mission Vidyamandira**
Title : Bangla Little Magazine **(Internship Code : BNGMS1)**
Prerequisite: H.S
Mode : **Online** (both Males & Females can apply)
Abstract and Internship Outcome: * Little Magazine History * Learn about the Cultural Movement & Literature Movement * Good editor can be made

Internship Supervisor : Dr Ramkrishna Mandal
Department of Bengali
Ramakrishna Mission Vidyamandira

Title : সামাজিক গণমাধ্যম ও বাংলা সাহিত্য: জীবিকার বহুমাত্রিকতা
(Internship Code : BNGRKM1)

Prerequisite: Basic knowledge in Computer

Mode : Online (both Males & Females can apply)

Abstract and Internship Outcome:

1. সামাজিক গণমাধ্যমের **Content** বিশ্লেষণ ও **Domain** অনুসারে কেস স্টাডি
2. বিভিন্ন **Social Media (Facebook/Instagram/Twitter/YouTube)** প্ল্যাটফর্মে **Content** তৈরির পদ্ধতি এবং বিকল্প পেশার অন্বেষণ
3. সামাজিক গণমাধ্যমের জন্য বিভিন্ন ওপেন সোর্স সফটওয়্যার ব্যবহার করার পদ্ধতি
4. প্রকল্প নির্মাণ

Internship Supervisor : Sri. Dipanjan Muhuri
Department of English
Ramakrishna Mission Vidyamandira

Title : Trauma and Literature
(Internship Code : ENGDM1)

Prerequisite: Students should have studied at least two semesters of Honours/General/Major/Minor courses in English.

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome:
This internship aims to familiarize the participants with the following theoretical issues through a select study of both literary and cinematic texts.

1. The (im)possibilities of locating and identifying trauma.
2. The Problem(s) of representing ruptures and interruptions in trauma narratives.
3. The politics of remembering trauma.
4. Understanding the complex interface between the material embodiment(s) and discursive manifestation(s) of trauma.
5. Trauma and the Problem of Witnessing.

Course Outcome: The participants are expected to engage with the experience of trauma as a disruptive event (and therefore outside the normative narrative expectations) both at the micro, neural level and at the macro, societal plane. They are also expected to be aware of the destructive and generative possibilities of traumatic experiences which often inform the tension between individual and collective remembering/forgetting.

Internship Supervisor : Dr. Souvik Dutta **Department of Philosophy** **Ramakrishna Mission Vidyamandira**
Title : Western Ethics and Contemporary India Philosophy **(Internship Code : PHISD1)**
Prerequisite: Higher secondary
Mode : **Online** (both Males & Females can apply)
Abstract and Internship Outcome: An attempt will be made to discuss the contemporary aspects of Western ethics. In addition, the relevance of contemporary Indian philosophy will also be discussed.

Internship Supervisor : Dr. Syed Shahed Riaz **Department of Chemistry** **Ramakrishna Mission Vidyamandira**
Title : Python Programming for Physio Chemical Problems **(Internship Code: CEMSSR1)**
Prerequisite: Plus two level maths and familiarity with computers
Mode : **Online** (both Males & Females can apply)
Abstract and Internship Outcome: At the end of the course, the learners are expected to be able to write Python codes for problems involving simple mathematical methods like numerical differentiation, integration or solving differential equations. In addition, they should be able to interpret and examine data through plotting using Python codes.

Internship Supervisor : Dr. Anirban Samanta
Department of Chemistry
Ramakrishna Mission Vidyamandira

Title : Design approaches and tools for DNA based nanostructure.
(Internship Code: CEMAS1)

Prerequisite: Under-graduate 2nd year (or higher) student majoring in Chemistry/ Physics/ Microbiology, with a completed course in elementary thermodynamics.

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome:

DNA nanostructure design is an interdisciplinary field combining nanotechnology, molecular biology, and materials science. DNA's predictable base pairing enables the programmable self-assembly of precise nanoscale architectures. Techniques such as DNA origami, tile-based assembly, and hybrid nanostructures allow the construction of complex two- and three-dimensional shapes with applications in biosensing, targeted drug delivery, and nanoelectronics. Advances in computational modeling and synthesis have further improved structural complexity, stability, and functionality. This internship introduces the fundamental principles of DNA nanostructure design, fabrication methods, and emerging applications.

After completing the internship, students will understand DNA structural and chemical properties, apply self-assembly principles to design nanostructures, use computational tools for modeling and optimization, and evaluate real-world applications in medicine and technology. They will also develop the ability to critically analyze current literature in DNA nanotechnology and understand future research directions.

Internship Supervisor : Dr. Saugata Mitra
Department of Mathematics
Ramakrishna Mission Vidyamandira

Title : Special Theory of Relativity
(Internship Code : MTMSM1)

Prerequisite: Basic properties of groups, basic concept of vector space and linear transformation, coordinate geometry and calculus.

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome: By this internship, the students will have a basic concept of postulates of special relativity, Lorentz transformation and its properties, Length contraction, Time dilatation, Simultaneity, general Lorentz transformation. Students will also know about the famous relation $E=mc^2$, c+c=c, concept of light cone and 4-vectors.

Title : Re-visiting Real Analysis
(Internship Code : MTMSM2)

Prerequisite: Basic concept of open set, closed set, limit point of a set, sequence and series, functions, limit, continuity and differentiation.

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome:
This internship program is dedicated to exploring interesting problems in real analysis, with a particular focus on compact subsets in R, continuity and differentiation. Beginning with foundational definitions and properties, the course progresses to address a series of challenging and thought-provoking problems in these areas.Outcome:
1. Demonstrate a deep understanding of the definitions and fundamental properties of compact sets in R, continuity, and differentiation.
2. Analyze and apply these concepts to formulate and solve advanced problems in real analysis independently.
3. Construct rigorous, logically coherent proofs involving compactness, continuous functions, and differentiable functions.
4. Communicate mathematical reasoning effectively, both in written form and verbally, in the context of higher-level problems in analysis.

Internship Supervisor : Dr. Arnab Jyoti Das Gupta
Department of Mathematics
Ramakrishna Mission Vidyamandira

Title : Mathematical Modelling using Ordinary Differential Equations
(Internship Code : MTMAJD1)

Prerequisite: Vector spaces, Matrices, determinant, ordinary differential equations (Linear). Knowledge of coding and plotting in any programming language will be beneficial.

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome: In this course we will explore the concept of mathematical modelling using ordinary differential equations. We will start with linear modelling and then move to nonlinear modelling. We will also plot phase portraits to explore and understand the stability.

At the end of the course the students will be able to create mathematical models for physical phenomena and will be able to analyze the stability of the system. They will also graphically plot the phase portrait.

Internship Supervisor : Dr. Suvra Kanti Chakraborty
Department of Mathematics
Ramakrishna Mission Vidyamandira

Title : Basic Graph Theory and Graph Algorithms
(Internship Code : MTMSKC1)

Prerequisite:
a. Understanding of sets, relations, and basic combinatorics
b. Basic knowledge of eigenvalues of matrices

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome: Students will gain a clear understanding of graph structures and fundamental algorithms, enabling them to model and analyze real-world problems using graph-theoretic approaches.

Internship Supervisor : Dr. Diptendu Sarkar
Department of Microbiology
Ramakrishna Mission Vidyamandira

Title : BIOINFORMATICS & STRUCTURAL BIOLOGY (Internship Code : MCBDS1)

Prerequisite: Must have knowledge on Molecular biology and biochemistry; personal computer with stable internet facility

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome: Literature Search Using Pubmed And Medminer
Sequence Retrieval from Nucleic Acid and Protein Databases
Sequence (FASTA and BLAST) Searches – Analysis of Parameters Affecting Alignment.
Pair Wise and Multiple Alignments of Sequences – Analysis of Parameters Affecting Alignment.
Evolutionary Studies / Phylogenetic Analysis – Identification of Orthologs And Paralogs.
Restriction Mapping, Primer Design and In-Silico PCR
Identification of Functional Sites in Genes / Genomes.
Mutation prediction and analysis
Find promoter sequences and TFBs in gene
Pattern Elucidation in Proteins Using PROSITE and STRING
PDB Structure Retrieval, Visualization and Analysis of Protein Ligand Interactions and Protein modeling and structure evaluation
Protein structure prediction and evaluation
Active sites, Motif and Domain prediction of protein
Molecular docking and evaluation: protein-protein docking and protein-ligand docking (Computer aided drug designing)
Microarray data analysis

Title : Computational Discovery of Plant-Derived Metabolites as Anti-Cancer Agents (Internship Code : MCBDS2)

Prerequisite: Must have knowledge on Molecular biology and biochemistry; personal computer with stable internet facility

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome: It was noted that India's rich plant biodiversity represented a vast and underutilized source of bioactive molecules with significant therapeutic potential. Experts highlighted that plant-derived compounds such as taxol and vinca alkaloids had historically transformed cancer treatment, underscoring the value of natural products in modern medicine. However, it was also acknowledged that conventional bioprospecting methods were slow, laborious, and resource-intensive. To address these limitations, it was suggested that integrating in-silico screening, network pharmacology, and machine learning could provide a scalable means of prioritizing candidate molecules before proceeding to experimental validation. Additionally, it was observed that many Indian research institutes had established DOI-aligned Memorandums of Understanding (MoUs) and possessed the necessary IT infrastructure to support high-performance computing and translational biology, thereby facilitating a more efficient drug discovery process.
Objectives
1. Curate a high-quality database of Indian (and global) plant metabolites with structural and bibliographic metadata.
2. Predict binding affinities of metabolites to prioritized cancer targets via docking, rescoring, and pharmacophore analysis.

3. Construct ML-enabled prediction models for virtual screening and ADMET profiling.
4. Validate top candidates in vitro using cancer cell lines and mechanistic assays.
5. Deliver open-access computational pipelines, data, and validated lead compounds.

Title : BIOINFORMATICS INSIGHT ON EVOLUTIONARY AND PROTEOMICS STUDY OF HUMAN RESPIRATORY SYNCYTIAL VIRUS AND ROTA VIRUS (Internship Code : MCBDS3)

Prerequisite: Must have knowledge on Molecular biology and biochemistry; personal computer with stable internet facility

Mode : **Online** (both Males & Females can apply)

Abstract and Internship Outcome: Human respiratory syncytial virus (RSV) is a member of the Orthopneumovirus genus, which belongs to the Pneumoviridae family. The respiratory infection epidemics caused by this negative sense single stranded RNA virus, often peak in the winter in temperate regions and in the rainy season in tropical climate. Although there might be regional variance, typically one of the two genotypes (A or B) predominates in a single season, rotating annually. With increased use of multiplex molecular tests, RSV's clinical impact on adults admitted to hospitals is defined. RSV is a source of sickness and mortality in children, elderly individuals, and immunocompromised patients. RSV causes a variety of clinical symptoms in adults, including upper and severe lower respiratory infections, and underlying illness exacerbations.
With this above broad perspective in mind the research work is undertaken with the following objectives:
1.Study of protein sequences and structures of human respiratory syncytial virus for stability, divergency and severity of infection.
2.Identification and application of lead compounds from online drug-bank and preparation of its computational derivatives for prevention of human respiratory syncytial virus.
3.Identification of natural bioactive (-phenolic) compounds to prevent human respiratory syncytial virus.
4.Strategy development for vaccine preparation against human respiratory syncytial virus.

Internship Supervisor: Dr. Debabrata Sinha
Department of Physics
Ramakrishna Mission Vidyamandira

Title: Foundation of Quantum mechanics and Quantum Computation (Internship Code: PHYDS1)

Prerequisite: Familiarity with linear algebra, complex numbers, and basic probability theory is favourable.

Mode : **Online** (both Males & Females can apply)

Abstract: This internship focuses on the conceptual and mathematical foundations of quantum mechanics and their application to quantum computation. The program will introduce the postulates of quantum mechanics, the structure of Hilbert space, quantum states and observables, measurement theory, and unitary time evolution, with special emphasis on two-level systems and quantum entanglement. Building on these foundations, the internship will explore the principles of quantum computation, including qubits, quantum gates, quantum circuits, and basic quantum algorithms. Conceptual issues such as superposition, nonlocality, and the quantum–classical boundary will be discussed to provide a deeper understanding of quantum information processing. The internship aims to develop both physical intuition and mathematical rigor, preparing participants for advanced study or research in quantum foundations and quantum technologies.

Outcome: **By the end of the internship, participants will be able to:**

1. **Understand and apply the** postulates of quantum mechanics **in the language of state vectors and operators.**
2. **Analyze** two-level quantum systems**, spin-1/2 dynamics, and quantum measurement processes.**
3. **Explain and work with** quantum superposition and entanglement**, including simple composite systems.**
4. **Describe the fundamentals of** quantum computation**, including qubits, quantum gates, and quantum circuits.**
5. **Gain conceptual familiarity with** basic quantum algorithms **and their advantages over classical counterparts.**
6. **Develop mathematical proficiency in** linear algebra–based formulations **of quantum theory.**
7. **Critically assess foundational issues in quantum mechanics relevant to quantum information.**

Title: Topology of non-interacting electrons (Internship Code: PHYDS2)

Prerequisite: Familiarity with quantum mechanics **and basic course of** solid-state physics **is desirable.**

Mode : **Online** (both Males & Females can apply)

Abstract: This internship introduces the topological aspects of electronic systems within the framework of non-interacting band theory. The program will focus on Bloch electrons in periodic potentials and the emergence of topological properties in band structures. Key concepts such as Berry phase, Berry curvature, and topological invariants (Chern number and Z2 indices) will be

developed from a quantum mechanical perspective. The internship will explore paradigmatic models including the two-dimensional electron gas, Haldane model, and time-reversal invariant topological insulators, emphasizing the role of symmetry and dimensionality. Physical consequences of band topology, such as quantized Hall conductance and topologically protected edge states, will be discussed through the bulk–boundary correspondence. The internship aims to build a rigorous foundation in topological band theory and prepare participants for advanced research in condensed matter physics and quantum materials.

Internship Outcomes

By the end of the internship, participants will be able to:

1. **Apply** Bloch band theory **to describe non-interacting electrons in periodic lattices.**
2. **Compute and interpret** Berry phase and Berry curvature **in crystalline systems.**
3. **Understand and evaluate** topological invariants **such as Chern numbers and Z2 indices.**
4. **Analyze simple** topological models **(e.g., Haldane model, quantum Hall systems).**
5. **Explain the** bulk–boundary correspondence **and the origin of protected edge states.**
6. **Identify the role of** symmetries **(time-reversal, inversion) in topological classification.**

Develop theoretical skills relevant to topological insulators and Chern insulators.