Prospectus – 2026-27

For Admission to M. Sc. Medical Bioinformatics

(Full-time) Programme

By

School of Translational Health Sciences

KERALA UNIVERSITY OF HEALTH SCIENCES

THRISSUR

CONTENTS

1. **Preface**

This Prospectus is published for Admission to Full-time M. Sc. Medical Bioinformatics programme – 2026 conducted at School of Translational Health Sciences (STHS) at the Headquarters of Kerala University of Health Sciences (KUHS) and contains general information and rules relating to the admission for the year 2026. Candidates are required to go through the Prospectus carefully and acquaint themselves with all the relevant information. Candidates are also requested to visit the official website of the KUHS (www.kuhs.ac.in) regularly for further notifications and announcements. The selection of admission is merit-based with an Entrance examination conducted by KUHS. The Intake of students is limited to 15 per year or as decided by the University.

2. **Centre**

School of Translational Health Sciences at the Headquarters of KUHS shall be the designated centre for conducting the course.

Note: KUHS reserves the right to change the centre if it is so desires.

3. **About School of Translational Health Sciences**

School of Translational Health Sciences was established under Kerala University of Health Sciences in 2023. Housed in the Vigyan Bhavan of KUHS campus, STHS offers an encouraging environment of learning for health science graduates.

4. **Objectives of STHS**

- Promote evidence-based medicine
- Evolve new treatments, diagnostics, and interventions
- Foster collaboration among researchers, clinicians, and the community
- Increase health equity and reduce health disparities
- Ultimately enhancing patient outcome through research and academics.

5. **Academic activities**

STHS conducts several Certificate programs and training programs and is is now offering full-time Post-Graduate program M.Sc in Medical Bioinformatics.

6. **About the Programme**

- M.Sc Medical Bioinformatics program is envisaged to enable the young health science graduates to acquire skill, training and knowledge necessary to prepare them to compete, succeed and excel globally in the field of health science research, diagnosis and therapeutics.
- The course offers diverse career opportunities like:
  - ❍ Research - MSc in Medical Bioinformatics facilitates acquisition of skills relevant to a career in research in many different bio-molecular disciplines. After the program, candidates can enter a research career.
  - ❍ Diagnostics - candidates can enter careers with clinical genetic diagnostic services, in molecular biology laboratories, where they can lead diagnostic services or research projects.
  - ❍ Clinical genetics - Candidates can utilize their new skills in careers as clinical geneticists or genetic counsellors.
  - ❍ Academic- Candidates can undertake and complete PhD in fields such as genetics, cancer studies, biosciences, neuroscience and genome science and technology.

7. **Description of the Programme**

The M.Sc Medical Bioinformatics is a Full-time Programme that will be conducted at School of Translational Health Sciences at KUHS Headquarters.

7.1 Programme objectives:

- 7.1.1 To enable students to address medical problems from a computational perspective by equipping them with the necessary computational and modelling skills.
- 7.1.2 To equip students with theoretical and practical skills for using computational tools to deal with problems in Biomedical and health sciences.
- 7.1.3 To expose students to other related domains of knowledge, for applying the acquired skills effectively.

7.2 Programme Specific Outcomes (PSO) for M.Sc Medical Bioinformatics:

- 7.2.1. Analyze genomic and transcriptomic data using bioinformatics tools to identify genetic variants associated with diseases.
- 7.2.2. Apply appropriate algorithms and databases to investigate gene function and disease associations.
- 7.2.3. Evaluate genetic data outputs to predict the molecular basis of inherited disorders and propose possible molecular diagnostic and therapeutic strategies.
- 7.2.4. Students will be able to take up successful programme specific jobs in research and industry.
- 7.2.5. Students will have broad understanding in core concepts of basic bio-molecular sciences, bioinformatics tools, omics, recombinant DNA technology and gene manipulation, research methodology and application of these concepts.

7.3. Course structure: Credit Semester System

Name of the Course	Semester
Basics of Molecular biology - Chemistry & Structure of DNA, RNA, Organization of Chromosomes, Inheritance, Cell cycle, DNA Replication, DNA repair, Transcription & Regulation of gene expression, Translation & Transport	1
Introduction to Bioinformatics - Operating Systems, Cloud computing, Bioinformatics tools, databases, file formats, Genome browsers, elements of genome, Analysis of genome, Gene finding, Sequence alignment, Bioinformatics Algorithms.	1
Basics of Computing for Bioinformatics – Python - Object-Oriented Programming, Applications.	1
Techniques in Molecular Biology - Chromosomal analysis, Recombinant DNA technology, Hybridization techniques, Gene Cloning, Gene editing, Gene silencing, Gene Therapy, PCR, Gene Sequencing.	1
Immunology and Immunoinformatics- Immunodeficiency Syndromes, Tumour immunology, immunotherapy, Autoimmunity, Immunization, Vaccines, Bioinformatics in infections.	1
Biostatistics and research methodology – Introduction, Measurement in health research,	1

Descriptive studies, Analytical study designs, Systematic reviews, meta-analysis, Ethics in scientific research,	
Computational Genomics – Phylogeny, phylogenetic tree, Phylogenetic analysis, Algorithms, Tree building software, Analysis of gene expression, Pipelines	2
Advances in Molecular Biology techniques - Systems biology, Synthetic Biology, variants, SNP analysis, Regulatory Genomics, Microarray, Metabolomics, Epigenetics.	2
Genetics of Cancer, Cardiovascular disorders & neurological disorders - Oncogenes, tumour suppressor genes, Apoptosis, Cancer, Cancer diagnosis & treatment, GWAS in CHD, Genetic testing for CVD, GWAS In Neurology	2
Programming in Perl, Web programming and databases- Features of Perl, BioPerl, web programming, DBMS, SQL, Oracle, MySQL, Web programming, HTML5	2
Health informatics & Imaging Informatics – Clinical decision support systems, Telehealth and Telemedicine, Digital Health, Mass Data, law and Ethics, Electronic health records, Imaging Informatics, Pattern Recognition, Neural Networks, AI for medical imaging	2
Reading, evaluation and writing of scientific literature	2
Proteomics - Protein separation & analysis, Protein structure prediction, databases, analysis of protein —protein interaction, Protein folding, Molecular modeling.	3
DNA sequencing - 1st generation DNA sequencing, 2nd generation sequencing, - NGS, Data analysis, genome assembly, Pipelines, WGS/ WES, Variant calling tools, 3rd generation sequencing, 4th generation sequencing .	3
Pharmacogenomics - Pharmaceutical Biotechnology, Pharmacokinetics, Pharmacogenetics, DNA microarray, In-Silico Drug Designing, Policies, pipelines, Molecular docking, HTS, Mendelian randomization.	3
Data analytics & machine- learning- ML Approaches, Supervised Learning, Unsupervised Learning, Deep Learning in Bioinformatics	3
Prenatal, Pediatric and Population genetics - Inherited diseases, prenatal screening, genetic counseling, Gene therapy. Population genetics - Quantitative genetics, Evolution, screening for carriers	3
Medical Bioinformatics project	3
Precision medicine, Technological Foundations, Applications, targeted therapies, Ethical, Legal, and Social Implications.	3
Ethics and law in genomics and Bioinformatics - plagiarism, animal/ human testing, anonymity, Ethics in genetic data, bio banking, AI and machine learning, Professional ethics, Intellectual Property	4
Project	4

8. **Duration and Eligibility for Admission**

8.1. The duration of the Post Graduate Programme shall be 4 Semesters (2 Academic Years). The maximum permitted time to successfully complete the Programme is twice the actual duration of the Programme, that is 4 years from the date of commencement of the Programme.

8.2. Candidates who have completed undergraduate degree courses in health science subjects belonging to Medical / Dental / Ayurveda / Homeopathy / Nursing / Pharmacy / Allied Health streams from KUHS or courses deemed as equivalent by KUHS and who have registered under the respective statutory regulatory councils of the state (if applicable) are eligible to pursue the programme.

8.3 The candidates who have undergone the prescribed courses through regular full-time mode of study only are eligible for admission.

8.4 Eligiblile relaxation in cut-off marks of the entrance examination shall be applicable for SC/ST categories.

8.5 Applicants whose place of birth and/or prior education is from a foreign country must submit supporting evidence, such as Indian passport.

8.6 A candidate seeking admission under KUHS must be certified as medically fit to undergo the programme by an official competent for the same.

8.7 The student shall not enroll in any other part – time or full-time academic / Research programmes (including part time / full time PhD / MPhil Programmes) / courses which necessitate physical attendance, while pursuing the programme.

8.8 There shall be no provision of stipend for the Programme.

9. **The medium of instruction:**

The medium of instruction and examination will be in English.

10. **Mode of Selection**
    a. The Academic Committee for Credit Semester System (AC-CSS) shall oversee admission to the programmes, by conducting a merit cum screening test and approve the rank list for admissions.
    b. The screening Entrance Examination will comprise of multiple-choice questions that assess basic undergraduate subject knowledge with total marks of 50. There will be 50 MCQs which are distributed equally in the following subjects – Total no. of questions – 50. Five questions each from Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Research methodology & Biostatistics, Computer science, Bioinformatics and Biotechnology.

    c. **Syllabus of the Entrance examination**
        ❐ **Anatomy** - General anatomy, General Histology
        ❐ **Physiology** - blood and body fluids, Cardiovascular physiology, Nerves &

muscles, GIT

- ❏ **Biochemistry** - cell and organelles, biomolecules, basic enzymology, basics of genetics, basic principles of biotechnology
- ❏ **Microbiology** - General Microbiology and Immunology, basic concepts of infection control
- ❏ **Pathology** - cell injury, cell death, inflammation, repair and regeneration, cancer
- ❏ **Pharmacology** - basic concepts, drug absorption and Bioavailability, Plasma half-life, drug elimination, mechanism of drug action, factors modifying drug action
- ❏ **Research methodology & Biostatistics** - Types of research, Measurement in health research, Descriptive statistics, Measures of central tendency
- ❏ **Computer Science** - Fundamental of Computers, Hardware and its components, Operating Systems, Networking, Internet browsers, search engines.
- ❏ **Bioinformatics** - definition, scope areas, applications; Biological databases, PubMed database, Sequence databases
- ❏ **Biotechnology** - basics of recombinant DNA technology, blotting techniques, PCR and its applications

d. Admission shall be made based on the rank list approved by the AC-CSS.

e. Transfer during the Programme is not permitted.

11. **Intake**

Intake of students is limited to **15** per year.

12. **Reservation of seats**

a. Usual relaxation of marks in the qualifying examination shall be applicable for SC/ST/SEBC/OEC/differently abled candidates, as fixed by KUHS/ Government.

b. If required number of seats are not filled by reserved one, the seats will be filled by other category based on the merit as per the rank list.

Reservation table

Sl. No.	Category	Percentage
1.	Scheduled Castes /Scheduled Tribes (SC/ST)	10
2.	Socially and Educationally Backward Classes (SEBC)	30
3.	Economically Weaker Sections in General Category (EWS)	10
4.	Un reserved (UR)	50

- 5% seats of the sanctioned strength shall be created, over and above for Physically Handicapped candidates.
- For categories under SEBC, reservation is restricted to candidates not belonging to the Creamy Layer of the respective communities.

Seat matrix

Total No. of seats	UR	SEBC	SC	ST	EWS

15	7	5	1	1	1*

*Subject to the availability of candidates. If unfilled, seats will go to UR.

13. **Application Fee:**

   a. Application fee, is Rs.2500/- for General category and Rs.2000/- for SC/ST categories. The application fee is non-refundable under any circumstances.

14. **Course fee** :

   a. The total duration is four semesters.

   b. The tuition fee is Rs. 50,000/- per semester.

   c. Additional fee to be paid at the start of 1st semester:

   Student Registration fee, Certificate Verification, Identity card, University Union fee and Sports fee   :   Rs. 3885/-

   Caution Deposit (Refundable)   :   Rs. 30,000/-.

Component		INR	
Tuition Fee		50,000/- per semester	
Admission Fee	Student Registration, Certificate Verification & Identity card	2985/-	3885/- (One-time)
	Union Fee	450/-	
	Sports Fee	450/-	
Caution Deposit (Refundable)		30,000/- **(One-time)**	

   d. The Examination fee should be remitted separately to the University as per direction from the University from time to time.

15. **Provision for Liquidated Damages:**

   a. A bond in the prescribed format for an amount of Rs. 1,00,000 /- (Rupees One Lakh Only) shall be executed by the student at the time of registration to the programme towards liquidated damages in the event of discontinuation from the programme leaving the seat vacant.

   b. In case a student leaves the programme after getting admission and the University is able to fill up the vacancy with another eligible student from the rank list, the remaining of the

programme fee after deducting 10% as processing charges along with Caution deposit will be refunded.

16. **Accommodation**

University does not provide residential accommodation for post-graduate students.

17. **Submission of applications**:
   a. Online facility for submitting application is available on KUHS website www.kuhs.ac.in
   b. Copies of all relevant certificates should be uploaded along with the application form.
   c. Candidates who had qualified from Universities outside Kerala should submit the eligibility certificate obtained from KUHS at the time of admission. Failure in production of Eligibility certificate will lead to rejection of the candidature.
   d. Fee once paid will not be refunded. Applications not in the prescribed format, without the requisite documents and application fee and received after the last date fixed by the University will be summarily rejected.
   e. The University reserves the right to reject any application which is incomplete or not in accordance with the norms published by the University.

18. **Documents to be furnished before the admitting authority:**

1. Aadhaar Card in original and its copy

2. Proof of Date of Birth/ Age : SSLC or equivalent/ Birth certificate

3. Original certificates/ Marklists to prove educational qualifications (SSLC, +2 etc.)

4. Non-Creamy Layer Certificate (NCLC) (in the case of reservation candidates other than SC/ST)

5. Community Certificate (for SC/ST candidates only)

6. Economically Weaker Sections certificate (in the case of EWS Category)

7. Certificate of Disability from the Medical Board certifying the percentage of Degree of Disability (for claiming reservation under Person with Disability (PwD))

8. Transfer Certificate (only on confirmation of admission/ seat)

9. Physical Fitness certificate from a Medical Officer not below the rank of an Assistant Surgeon

10. Migration certificate

11. Nativity/ Domicile certificate

12. Passport size photo (3 no.s)

Note:

- Two attested copies of the above certificates should be submitted at the time of admission.

- Additional documents: The candidates securing admission to the PG Course has to submit the anti-dowry declaration / undertaking in the format issued by Kerala University of Health Sciences.

  The format is attached as Annexure: I

19. **Preventive Measures Against Ragging:**

19.1 According to the Kerala Prohibition of Ragging Act, 1998, "ragging" means doing of any act by disorderly conduct to a student of an educational institution, which causes or is likely to cause physical or psychological harm or raising apprehension or shame or embarrassment to that student and includes teasing or abusing or playing practical jokes or causing hurt to such students or asking a student to do any act or to perform something which such student will not in the ordinary course be willing to do.

19.2 All institutions will have to abide by the directives of the Honorable Supreme Court of India, Dated May 16, 2007 in SLP No. (S) 24295 of 2006 University of Kerala Vs Council, Principals, Colleges, Kerala & Ors [with SLP (C) No.24296-99/2004 & W.P (Crl) No. 173/2006 & SLP (C) No.14356/2005] and the recommendations approved by the Honorable Supreme Court of India on effective prevention of ragging in educational institutions.

19.3 In case, the applicant for admission is found to have indulged in ragging in the past or if it is noticed later that he/she has indulged in ragging, admission may be refused or he/she shall be expelled from the educational institution.

19.4 It shall be the collective responsibility of the authority of the institution to see to it that effective steps for preventing ragging are taken.

19.5 Anti-ragging committees and anti-ragging squads will have to be formed to take effective measures against ragging and they should adhere to the stipulations and effectively monitor and comply with the directives.

19.6 Each of the student of the institution and his/her parents, or guardian are required to submit a combined undertaking at the time of registration which is mandatory for registration/admission.

Course Syllabus and Regulation are available on the University website.

Contact details

For assistance, please contact the office of School of Translational Health Sciences

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phone: 0487 2207798 (10.00 AM to 5.00 PM)