PROGRAM PROFILE

KING MONGKUT'S UNIVERSITY OF TECHNOLOGY THONBURI

MSC IN BIOINFORMATICS AND SYSTEMS BIOLOGY

Bioinformatics and Systems Biology are cutting-edge disciplines focusing on analyzing biological data, from genetic sequences to complex metabolic networks. Our programs provide the interdisciplinary skills needed to manage, integrate, and analyze this data, offering a unique opportunity for students with interests in both biology and computer science. Craft your bioinformatics and systems biology skills through intensive learning modules in our international MSc program, which integrates computer and biological sciences. This program offers hands-on training, focusing on omics data analysis, database design, software development, and programming. Students apply their skills to real-world problems, gaining invaluable research experience that prepares them for a successful career in the global scientific community. With over 20 years of experience, our graduates are now thriving in top academic institutions and world-renowned companies.

PROGRAM LEARNING OUTCOMES

1 : Solves biological problems using appropriate bioinformatics and systems biology approaches.

1A : Analyzes high-throughput biological data by integration of knowledge from different disciplines (biology, computing, statistics, and mathematics)

1B : Evaluates scientific literature with an understanding of bioinformatics and systems biology frameworks to formulate and justify a research question or testable hypothesis, following the mentor's guidelines.

1C : Selects appropriate bioinformatics and systems biology methods to solve a research question or test hypothesis.

2 : Communicates accurate information relating to bioinformatics and systems biology to diverse audiences.

3 : Takes part competently in diverse teams to accomplish a common goal by sharing their own ideas and accepting others' opinions.

4 : Demonstrates research integrity in terms of responsible conduct of research.

CURRICULUM

- 📜 Pre-course
- ★ Core course
- 📖 Elective courses

Pre-course (S/U)

- 📜 BIF51100 Programming Fundamentals
- 📜 BIF561 Analysis and Design of Algorithms

English Pre-course (S/U)

- 📜 LNG550 Remedial English Course for Post Graduate Students
- 📜 LNG601 Foundation English for International Programs

Others

- ★ BIF692 Seminar in Bioinformatics and Systems Biology I (S/U)
- ★ BIF694 Seminar in Bioinformatics and Systems Biology II (S/U)
- ★ BIF698 Thesis
- 📖 IBS63000 Entrepreneurship in Biosciences

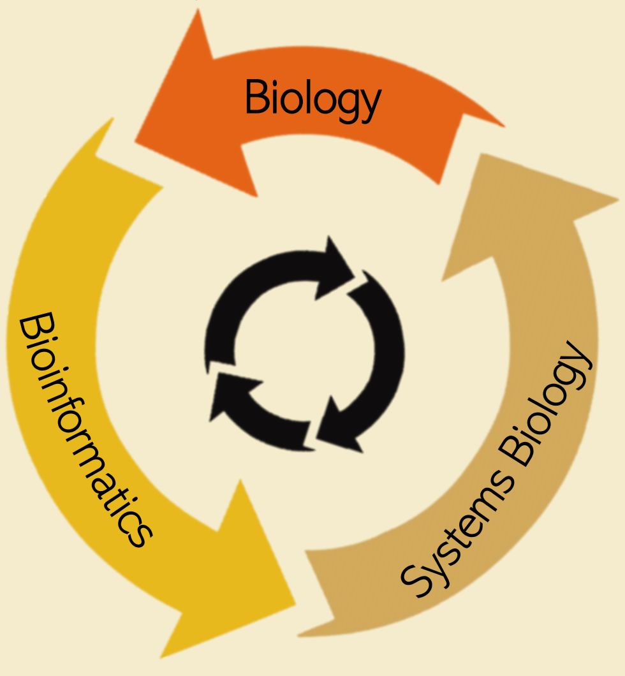
Bioinformatics

Omics data analysis

- ★ BIF62201 Command-Line Techniques for Molecular Biological Data and File Manipulation
- ★ BIF62202 Computational Approaches to Sequence and Structural Bioinformatics
- ★ BIF62203 Sequencing Technologies and Genome Analysis
- ★ BIF62204 Omics Data and Analyses
- ★ BIF62205 Research Project in Bioinformatics
- ★ BIF65201 Basic Biostatistics for Bioinformatics and Systems Biology: Descriptive and Inferential Statistics
- ★ BIF65202 Biostatistics for Data-Driven Analysis
- ★ BIF65203 R for High-Throughput Biological Data Analysis
- 📖 BIF631 Database Systems for Bioinformatics
- ★ BIF633 Data Mining for Bioinformatics
- 📖 BIF641 Systems Analysis and Design
- 📖 BIF651 Computational Intelligence for Bioinformatics
- 📖 BIF62301 Advanced and Emerging Omics Technologies
- 📖 BIF62401 Microbiome Data Analysis using Amplicon Sequencing Technology
- 📖 BIF62402 Metagenomic Data Analysis

Biology

- ★ BIF50100 Molecular Biology
- 📖 BIF602 Molecular Biochemistry



Systems Biology

Systems analysis, Data integration & Modeling

- ★ BIF77201 Network Biology and Qualitative Modeling
- ★ BIF77202 Quantitative Bio-Systems Modeling
- ★ BIF77203 Quantitative Molecular Network Modeling
- ★ BIF77204 AI for Bioinformatics and Systems Biology
- ★ BIF77205 Research Project in Systems Biology
- 📖 BIF77300 Network Biology and Omics Data Integration
- 📖 BIF77400 Omics Integrated Bio-Systems Modeling
- 📖 BIF77501 Modeling Techniques for Computational Cell Biology
- 📖 BIF77502 Model Interpretation and Prediction for Cell Biology Problems
- 📖 BIF77503 Systems Biomedicine for Personalized Healthcare
- 📖 BIF77600 Model-Based Design for Synthetic Biology
- 📖 BIF77700 Systems Modeling for Metabolic Engineering
- 📖 BIF77800 Plant and Crop Modeling for Smart Farming

STUDY AT

School of Bioresources and Technology
(Bangkhuntein)

School of Information Technology
(Bangmod)

STUDY PLAN

1-year Coursework → 1-year research

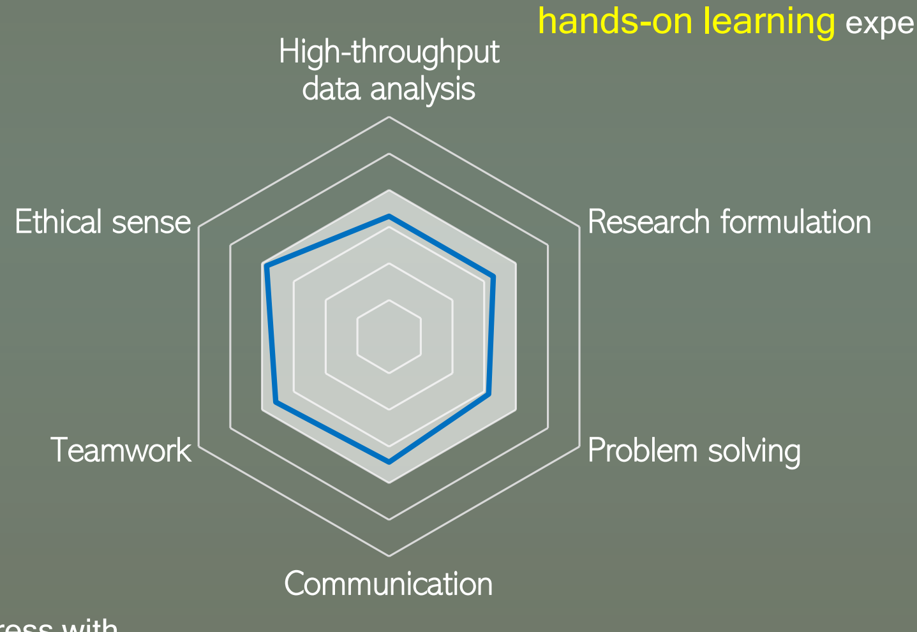
Total 32 Credit

HIGH IMPACT RESEARCH

- ◇ Metagenomics and microbiome
- ◇ Comparative genomics
- ◇ Medical Informatics
- ◇ BioSystems design by Systems Biology & Synthetic Biology
- ◇ Drug Design and Discovery
- ◇ Systems Biomedicine
- ◇ Big Data for Life Sciences

PROGRESS TRACKING PLATFORM

Actively engage with a unique **hands-on learning** experience



Track your progress with well-designed **assessment rubrics**

CAREER OPPORTUNITIES

- ◇ Researcher or academic professional in bioinformatics, systems biology, computer science, biological sciences, or medical science.
- ◇ Analyst or computer systems designer specializing in bioinformatics or systems biology.
- ◇ Developer of software or websites related to bioinformatics and/or systems biology.
- ◇ Manager of software systems in the bioinformatics and/or systems biology domain.
- ◇ Research project analyst in bioinformatics and/or systems biology.

CRITERIA FOR APPLICANTS

- ◇ A bachelor's degree in biological sciences, computer science, computer engineering, medical sciences, chemistry, mathematics, statistics, or related disciplines.
- ◇ (Optional) English test score (TOEFL iBT, IELTS Academic, TETET, PTE Academic or Duolingo English Test)

INTERNATIONAL JOURNAL PUBLICATIONS FROM OUR ACADEMIC STAFFS & STUDENTS

SCIENTIFIC REPORTS · genes · frontiers in Microbiology · nature genetics · nature microbiology · Genes & Development · OMICS A Journal of Integrative Biology · COMMUNICATIONS BIOLOGY · BMC Systems Biology · BMC Genomics · PLOS ONE · THE EMBO JOURNAL · Nucleic Acids Research · nature COMMUNICATIONS · processes · MICROBIOLOGY LETTERS · AMERICAN SOCIETY FOR MICROBIOLOGY Journal of Bacteriology · FEMS MICROBIOLOGY LETTERS

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Updated in 2026 (Improved MSc curriculum in 2026)