

# GMB 2023-2026 Curriculum

## BIOCHEMISTRY AND STRUCTURAL BIOLOGY

GMB-1000 Biochemistry and structural biology, advanced studies 103 cr

### Compulsory courses, 73 cr

GMB-001 Principles of genetics and molecular biosciences, 14 cr

GMB-010 Master's Thesis, 30 cr

GMB-019 MSc thesis seminar, 3 cr

VIIKB-001 Master's Maturity Test BY, 0 cr

GMB-006 Book exam, 5 cr

GMB-008 Research project in biochemistry/structural biology, 10 cr

GMB-105 Introduction to structural biology and biophysics, 5 cr

GMB-106 Protein Structure, Function and Folding, 5 cr

MPHARM-004 Research ethics, 1 cr

### Elective courses (at least 30 cr of the following)

GMB-101 Enzymes, 3-5 cr

GMB-102 Membrane biology and biochemistry, 5 cr

GMB-103 Advanced molecular biology techniques, 5 cr

GMB-107 Chemical Biology, 5 cr

GMB-108 Protein Characterization and Crystallization, 3 cr

GMB-301 Advanced cell biology, 5 cr

GMB-005 Research project 10 cr

GMB-901 Introduction to Research career, 2 cr

GMB-902 HiLIFE Research project, 13 cr [requires GMB-901]

GMB-003A Internship, 5 cr

GMB-003B Internship, 5 cr

Alternatively, PROV-211 Introduction to molecular modelling for life science students, 5 cr

OR MPHARM-008 Quantitative methods for pharmaceutical research, 5 cr

PROV-606 Mass spectrometry in bioanalysis, 5 cr

IPS-121 Plant Biochemistry and Cell Biology, 5 cr

MMB-118 Metabolic engineering lab course, 5 cr

NEU-415 Creative Scientific Thinking, 5 cr

Alternatively, KEK228 Bioinorganic chemistry, 5 cr OR BSCH2001 Organic Chemistry 2, 5 cr

or other courses suitable for the study track offered by GMB or other Master's or PhD programmes (according to the personal study plan)

## OTHER STUDIES

### Compulsory, 2 cr

Alternatively KK-ENG501 Academic Writing 1: Principles and Practice (Master's students), 2 cr OR

KK-ENG502 Academic Writing 2: Process and Feedback (Master's students), 2 cr

### Optional studies, 0-15 cr

(The remaining part of 120 cr)

Free-choice studies supporting the development of the skills and competencies of the student; examples:

GMB-020 Career planning and project management, 5 cr

SUST-001 Sustainability course, 3 cr

PED590 Towards better well-being and studying, 3 cr

GMB-013 Teaching practice, 1-5 cr

VIIKB-005 Participation in administrative bodies and student organizations, 2 - 5 cr

VIIKB-002 Tutoring BY, 5 cr

## GENETICS AND GENOMICS

GMB-2000 Genetics and Genomics, Advanced studies, 103 cr

**Compulsory courses, 68 cr**

GMB-001 Principles of genetics and molecular biosciences, 14 cr

GMB-010 Master's Thesis, 30 cr

GMB-019 MSc thesis seminar, 3 cr

VIIKB-001 Master's Maturity Test BY, 0 cr

GMB-006 Book exam, 5 cr

GMB-208 Human and cancer genetics, 5 cr

GMB-202 Essentials of gene regulation & epigenetics 5 cr

GMB-204 Population genetics and genomics, 5 cr

MPHARM-004 Research ethics, 1 cr

**Alternative courses (15 cr from the following)**

GMB-207 New experimental approaches in genomics, 5 cr

GMB-304 Methods in functional genetics and development, 5 cr (lab course, limited intake)

LSI31008 Elements of bioinformatics, 5 cr

LSI34002 Genome-wide association studies, 5 cr

GMB-203 RNA-seq data analysis, 5 cr

LSI31003 Machine learning in Molecular Biology, 5 cr

**Elective courses (at least 20 cr from the following)**

GMB-005 Research project, 10 cr

GMB-209 Practical training in human genetics, 5 cr

GMB-210 Environmental epigenetics, 2 cr

GMB-103 Advanced molecular biology techniques, 5 cr

LSI31007 Algorithms in Genome Analysis, 5 cr

NEU-415 Creative Scientific Thinking, 5 cr

GMB-003A Internship period 1, 5 cr

GMB-003B Internship period 2, 5 cr

GMB-901 Introduction to research career, 2 cr

GMB-902 HiLIFE Research project, 13 cr [requires GMB-901]

or other courses suitable for the study track offered by GMB or other Master's or PhD programmes (according to the personal study plan)

## OTHER STUDIES

**Compulsory, 2 cr**

Alternatively, KK-ENG501 Academic Writing 1: Principles and Practice (Master's students), 2 cr OR

KK-ENG502 Academic Writing 2: Process and Feedback (Master's students), 2 cr

**OPTIONAL STUDIES, 0-15 cr**

(The remaining part of 120 cr)

Free-choice studies supporting the development of the skills and competencies of the student;

examples:

GMB-020 Career planning and project management, 5 cr  
SUST-001 Sustainability course, 3 cr  
PED590 Towards better well-being and studying, 3 cr  
GMB-013 Teaching practice, 1-5 cr  
VIKB-005 Participation in administrative bodies and student organizations, 2 - 5 cr  
VIKB-002 Tutoring BY, 5 cr

## CELL AND DEVELOPMENTAL BIOLOGY

GMB-3000 Cell and Developmental Biology, Advanced Studies, 103 cr

### Compulsory courses (78 cr)

GMB-001 Principles of genetics and molecular biosciences, 14 cr  
GMB-010 Master's Thesis, 30 cr  
GMB-019 MSc thesis seminar, 3 cr  
VIKB-001 Master's Maturity Test BY, 0 cr  
GMB-301 Advanced cell biology, 5 cr  
GMB-302 Methods in cell biology, 5 cr  
GMB-304 Methods in functional genetics and development, 5 cr  
GMB-305 Stem cells and organogenesis, 5 cr  
GMB-306 Seminar in cell and developmental biology, 5 cr  
GMB-006 Book exam, 5 cr  
MPHARM-004 Research ethics, 1 cr

### Elective courses in the study track (at least 25 cr of the following)

GMB-007 Elective Book exam, 5 cr  
GMB-005 Research project, 10 cr  
GMB-102 Membrane biology and biochemistry, 5 cr  
GMB-103 Advanced molecular biology techniques, 5 cr  
GMB-203 RNA seq data analysis, 5 cr  
GMB-207 New experimental approaches in genomics, 5 cr  
GMB-202 Essentials of gene regulation & epigenetics, 5 cr  
GMB-208 Human and cancer genetics, 5 cr  
GMB-901 Introduction to research career, 2 cr  
GMB-902 HiLIFE Research project, 13 cr [requires GMB-901]  
GMB-003A Internship period 1, 5 cr  
GMB-003B Internship period 2, 5 cr  
NEU-231 Regeneration and aging, 5 cr  
NEU-561 Principles of bioscience omics, 10 cr  
NEU-207 Regulatory networks in metabolism, 5 cr  
NEU-203 Systems Physiology, 5 cr  
NEU-415 Creative Scientific Thinking, 5 cr  
MMB-116 Cell biology of viral infection, 5 cr  
NEU-531 Developmental Neuroscience, 5 cr  
NEU-522 Pre-clinical models of neurological diseases and emerging therapies, 5 cr  
ILS-111 Imaging technologies in biological sciences, 2 cr  
ILS-108 Evo-devo of vertebrate systems, 5 cr  
ILS-110 Growth factors and their receptors, 3 cr  
IPS-121 Plant Biochemistry and Cell Biology, 5 cr  
TMED-103 Cancer from biology to research, 5 cr  
TMED-202 Regenerative Medicine from Bench to Bedside, 5 cr  
or other courses suitable for the study track offered by GMB or other Master's or PhD programmes (according to the personal study plan)

## OTHER STUDIES

### Compulsory, 2 cr

Alternatively, KK-ENG501 Academic Writing 1: Principles and Practice (Master's students), 2 cr OR KK-ENG502 Academic Writing 2: Process and Feedback (Master's students), 2 cr

### OPTIONAL STUDIES, 0-15 cr

(The remaining part of 120 cr)

Free-choice studies supporting the development of the skills and competencies of the student; examples:

GMB-020 Career planning and project management, 5 cr

SUST-001 Sustainability course, 3 cr

PED590 Towards better well-being and studying, 3 cr

GMB-013 Teaching practice, 1-5 cr

VIIKB-005 Participation in administrative bodies and student organizations, 2 - 5 cr

VIIKB-002 Tutoring BY, 5 cr

## MOLECULAR AND ANALYTICAL HEALTH BIOSCIENCES

GMB-4000 Molecular and Analytical Health Biosciences, Advanced Studies, 103 cr

### Compulsory courses, 81 cr

GMB-001 Principles of genetics and molecular biosciences, 14 cr

GMB-010 Master's Thesis, 30 cr

GMB-019 MSc thesis seminar, 3 cr

VIIKB-001 Master's Maturity Test BY, 0 cr

GMB-401 Integrative Health Biosciences, 10 cr

NEU-561 Principles of Bioscience Omics, 10 cr

TMED-907 Laboratory Medicine and Molecular Diagnostics, 3 cr

NEU-203 Systems physiology or other physiology course, 5 cr

GMB-006 Book exam, 5 cr

MPHARM-004 Research ethics, 1 cr

### Elective courses in the study track, at least 22 cr of the following;

(minimum 10 cr research or analytics courses)

GMB-005 Research project, 10 cr

GMB-901 Introduction to research career, 2 cr

GMB-902 HiLIFE Research project, 13 cr [requires GMB-901]

GMB-003A Internship period 1, 5 cr

GMB-003B Internship period 2, 5 cr

GMB-007 Elective Book exam, 5 cr

GMB-102 Membrane biology and biochemistry, 5 cr

GMB-103 Advanced molecular biology techniques, 5 cr

GMB-107 Chemical Biology, 5 cr

GMB-108 Protein Characterization and Crystallization, 3 cr

GMB-202 Essentials of gene regulation & epigenetics, 5 cr

GMB-203 RNA seq data analysis, 5 cr

GMB-207 New experimental approaches in genomics, 5 cr

GMB-208 Human and cancer genetics, 5 cr

GMB-301 Advanced cell biology, 5 cr

GMB-302 Methods in cell biology, 5 cr

GMB-304 Methods in functional genetics and development, 5 cr

GMB-305 Stem cells and organogenesis, 5 cr

GMB-306 Seminar in cell and developmental biology, 5 cr

NEU-415 Creative Scientific Thinking, 5 c  
NEU-231 Regeneration and aging, 5 cr  
NEU-207 Regulatory networks in metabolism, 5 cr  
TMED-103 Cancer from biology to research, 5 cr  
TMED-202 Regenerative Medicine from Bench to Bedside, 5 cr  
TMED-915 Introduction to Bioinformatics  
PROV-606 Mass spectrometry in bioanalysis, 5 cr  
PROV-415 Advanced immunobiology, 5 cr  
LSI31008 Elements of bioinformatics, 5 cr  
LSI31003 Machine Learning in Molecular Biology, 5 cr  
KEM358 Quality assurance in analytics  
KEM331 Separation techniques  
or other courses suitable for the study track offered by GMB or other Master's or PhD programmes  
(according to the personal study plan)

## OTHER STUDIES

### Compulsory, 2 cr

Alternatively, KK-ENG501 Academic Writing 1: Principles and Practice (Master's students), 2 cr OR  
KK-ENG502 Academic Writing 2: Process and Feedback (Master's students), 2 cr

### OPTIONAL STUDIES, 0-15 cr

(The remaining part of 120 cr)

Free-choice studies supporting the development of the skills and competencies of the student;  
examples:

GMB-020 Career planning and project management, 5 cr

SUST-001 Sustainability course, 3 cr

PED590 Towards better well-being and studying, 3 cr

GMB-013 Teaching practice, 1-5 cr

VIIKB-005 Participation in administrative bodies and student organizations, 2 - 5 cr

VIIKB-002 Tutoring BY, 5 cr

## BIOLOGY SUBJECT TEACHER STUDY TRACK

GMB-5000 Biology Subject Teacher Study Track, Advanced Studies, 60 cr

### Compulsory courses, 53 cr

GMB-010 Master's Thesis, 30 cr

GMB-019 MSc thesis seminar, 3 cr

VIIKB-001 Master's Maturity Test BY, 0 cr

GMB-001 Principles of genetics and molecular biosciences, 14 cr

MPHARM-004 Research ethics, 1 cr

GMB-006 Book exam, 5 cr

### Elective courses supporting professional development, 7 cr

VIIKB-002 Tutoring BY, 5 cr

GMB-013 Teaching practice, 1-5 cr

GMB-003A Internship period 1, 5 cr

GMB-003B Internship period 2, 5 cr

VIIKB-005 Participation in administrative bodies and student organizations, 2 - 5 cr

GMB-020 Career planning and project management, 5 cr

KK-ENG501 Academic Writing 1: Principles and Practice (Master's students), 2 cr OR KK-ENG502  
Academic Writing 2: Process and Feedback (Master's students), 2 cr

or other courses suitable for the study track offered by GMB or other Master's or PhD programmes (according to the personal study plan)

PED100 Education, pedagogical studies for teachers, 60 cr