



Mahidol University
Institute of
Molecular Biosciences

M G G E

HANDBOOK

2022



International Program
Molecular Genetics and Genetic Engineering

CONTENTS

2021

Page

1. Administration	2
1.1 Administrators	2
1.2 M.Sc. - Ph.D. Administrative Program Committee	2
2. Graduate Programs	3
2.1 Curriculum	4
2.1.1 Master of Science Program	4
2.1.2 Doctor of Philosophy Program	4
2.2 List of Courses and Course description	8
2.3 Faculty	14
3. Appendices	15
3.1 Program Learning Outcomes (PLOs)	15
3.2 Curriculum Mapping (M.Sc.)	16
3.3 Curriculum Mapping (Ph.D.)	17
3.4 Students' Thesis Process	22
3.5 Course Registration and Fee Payment for Graduate Students, Academic Year 2021	28
3.6 Announcements	29
3.7 Laboratory Guidelines	35
3.8 Professional and Personal Skills Development	36
3.9 Appeal Procedure	37
3.10 Course Schedule 2021	38

1. Administration

1.1 Administrators

Prof. Narattaphol Charoenphandhu	Director
Assoc. Prof. Apinunt Udomkit	Deputy Director for Academic Affairs
Asst. Prof. Narisorn Kitiyanant	Deputy Director for Administration
Asst. Prof. Arthorn Sanpanich	Acting Deputy Director for Planning and Quality Development

1.2 M.Sc.-Ph.D. Administrative Program Committee

Asst. Prof. Thananya Thongtan	Program Advisor
Assoc. Prof. Panadda Boonserm	Program Director
Assoc. Prof. Chalernporn Ongvarrasopone	Member
Assoc. Prof. M.L. Saovaros Svasti	Member
Asst. Prof. Kusol Pootanakit	Member
Asst. Prof. Chalongrat Noree	Member
Lect. Dr. Poochit Nonejuie	Member
Assoc. Prof. Apinunt Udomkit	Member & Secretary

2. Graduate Programs

The international postgraduate program in *Molecular Genetics and Genetic Engineering* was established in 1994. The program provides comprehensive lectures and research opportunities in both basic and applied aspects as follows:

- Molecular Medicine
- Molecular Biology for Agricultural and Industrial Applications
- Molecular Microbiology
- Shrimp Molecular Biology
- Structural Molecular Biology
- Bioinformatics
- Multi-Omics
- Drug Discovery
- Genome Editing and Cell-Based Technology

Education Philosophy

The M.Sc. program philosophy is to facilitate learners to attain academic achievement through learning-centered education, outcome-based education and constructivism for their self-development of knowledge and new skills in Molecular Biology/Genetics and related fields.

The Ph.D. program philosophy is to facilitate learners to attain academic achievement through learning-centered education, outcome-based education and constructivism for their self-development of novel knowledge, skills and innovative concepts in Molecular Biology/Genetics and related fields.

Career Opportunities of the Graduates

- Academic staff in Molecular Genetics and relevant disciplines in the university
- Researchers in research institutes, universities or private sectors
- Biotechnology entrepreneurs
- Others such as sale representatives or product specialists

2.1 Curriculum

2.1.1 Master of Science Program

The M.Sc. curriculum consists of one-year course work (24 credits) and one-year research project (12 credits). Possible transfer to the Ph.D. program after completion of at least two years study would be considered on the basis of academic performance.

Year	Semester 1	Semester 2
1	MBMG 500 Essentials in Molecular Biology 2 (2-0-4) MBMG 512 DNA Engineering 2 (1-2-3) MBMG 513 Gene Expression and Applications 3 (2-2-5) Elective course not less than 3 credits Total 10 credits	MBMG 514 Protein Structure and Function 3 (2-2-5) MBMG 515 Protein Technologies and Applications 2 (1-2-3) MBMG 516 Cell Technologies and Applications 3 (1-6-4) MBMG 615 Research Rotations in Molecular Biology 3 (0-9-3) Total 11 credits
2	MBMG 521 Molecular Genetics and Genetic Engineering Seminar I 1 (1-0-2) Elective course not less than 1 credit MBMG 698 Thesis 6 (0-18-0) Total 8 credits	MBMG 522 Molecular Genetics and Genetic Engineering Seminar II 1 (1-0-2) MBMG 698 Thesis 6 (0-18-0) Total 7 credits

2.1.2 Doctor of Philosophy Program

The Doctor of Philosophy program is composed of two study plans.

2.1.2.1 The first study plan is a research program designed for those who obtained an M.Sc. degree with research experience. No course work is required.

Plan 1 Dissertation only

Year	Semester 1	Semester 2
1	(Qualifying Examination) MBMG 898 Dissertation 8 (0-24-0) Total 8 credits	MBMG 898 Dissertation 8 (0-24-0) Total 8 credits
2	MBMG 898 Dissertation 8 (0-24-0) Total 8 credits	MBMG 898 Dissertation 8 (0-24-0) Total 8 credits
3	MBMG 898 Dissertation 8 (0-24-0) Total 8 credits	MBMG 898 Dissertation 8 (0-24-0) Total 8 credits

Notes:

1. Students may take some coursework upon the recommendation of the major advisor or the program committee and must meet the assessment criteria of the course (e.g. seminar course registration for Audit).
2. This study plan may include overseas research experience.

2.1.2.2 The second study plan consists of both course work and research.

Plan 2 Course works and Dissertation

Plan 2.1 For students holding an M.Sc. degree

For those who obtained an M.Sc. degree, students are expected to undertake at least 12 credits of course work and conduct a research thesis for 36 credits.

Year	Semester 1	Semester 2
1	MBMG 504 Advanced Research skill in Molecular Biology 3 (0-9-3) Elective course not less than 2 credits (Qualifying Examination) Total 5 credits	MBMG 699 Dissertation 8 (0-24-0) Elective course not less than 1 credit Total 9 credits
2	MBMG 621 Doctoral Seminar in Molecular Genetics and Genetic Engineering	MBMG 622 Doctoral Research Seminar in Molecular Genetics and Genetic Engineering

Year	Semester 1	Semester 2
	<div>1 (1-0-2)</div> <div>MBMG 699 Dissertation 7 (0-21-0)</div> <div>Elective course not less than 3 credits</div> <div>Total 11 credits</div>	<div>1 (1-0-2)</div> <div>MBMG 699 Dissertation 7 (0-21-0)</div> <div>Total 8 credits</div>
3	<div>MBMG 623 Advanced Doctoral Research Seminar in Molecular Genetics and Genetic Engineering 1 (1-0-2)</div> <div>MBMG 699 Dissertation 7 (0-21-0)</div> <div>Total 8 credits</div>	<div>MBMG 699 Dissertation 7 (0-21-0)</div> <div>Total 7 credits</div>

Plan 2.2 For students holding an B.Sc. degree

For those who graduated with a B.Sc. Degree with a GPA above 3.5, the course requirements are 26-credit course work including seminars and a 48-credit research thesis.

Year	Semester 1	Semester 2
1	<div>MBMG 500 Essentials in Molecular Biology 2 (2-0-4)</div> <div>MBMG 512 DNA Engineering 2 (1-2-3)</div> <div>MBMG 513 Gene Expression and Applications 3 (2-2-5)</div> <div>Elective course not less than 3 credits</div> <div>Total 10 credits</div>	<div>MBMG 514 Protein Structure and Function 3 (2-2-5)</div> <div>MBMG 515 Protein Technologies and Applications 2 (1-2-3)</div> <div>MBMG 516 Cell Technologies and Applications 3 (1-6-4)</div> <div>Total 8 credits</div>
2	<div>(Qualifying Examination)</div> <div>MBMG 504 Advanced Research Skill in Molecular Biology 3 (0-9-3)</div> <div>Elective course not less than 2 credits</div> <div>Total 5 credits</div>	<div>MBMG 799 Dissertation 8 (0-24-0)</div> <div>Elective course not less than 1 credit</div> <div>Total 9 credits</div>

Year	Semester 1	Semester 2
3	MBMG 621 Doctoral Seminar in Molecular Genetics and Genetic Engineering <div>1 (1-0-2)</div> MBMG 799 Dissertation <div>10 (0-30-0)</div> Total 11 credits	MBMG 622 Doctoral Research Seminar in Molecular Genetics and Genetic Engineering <div>1 (1-0-2)</div> MBMG 799 Dissertation <div>10 (0-30-0)</div> Total 11 credits
4	MBMG 623 Advanced Doctoral Research Seminar in Molecular Genetics and Genetic Engineering <div>1 (1-0-2)</div> MBMG 799 Dissertation <div>10 (0-30-0)</div> Total 11 credits	MBMG 799 Dissertation <div>10 (0-30-0)</div> Total 10 credits

2.2 List of Courses

Required Courses

		Credit (Lecture-Lab-Self Study)
MBMG 500	Essentials in Molecular Biology	2 (2-0-4)
MBMG 504	Advanced Research Skills in Molecular Biology	3 (0-9-3)
MBMG 512	DNA Engineering	2 (1-2-3)
MBMG 513	Gene Expression and Applications	3 (2-2-5)
MBMG 514	Protein Structure and Function	3 (2-2-5)
MBMG 515	Protein Technologies and Applications	2 (1-2-3)
MBMG 516	Cell Technologies and Applications	3 (1-6-4)
MBMG 521	Molecular Genetics and Genetic Engineering Seminar I	1 (1-0-2)
MBMG 522	Molecular Genetics and Genetic Engineering Seminar II	1 (1-0-2)
MBMG 615	Research Rotations in Molecular Biology	3 (0-9-3)
MBMG 621	Doctoral Seminar in Molecular Genetics and Genetic Engineering	1 (1-0-2)
MBMG 622	Doctoral Research Seminar in Molecular Genetics and Genetic Engineering	1 (1-0-2)
MBMG 623	Advanced Doctoral Research Seminar in Molecular Genetics and Genetic Engineering	1 (1-0-2)

Elective Courses

MBMG 601	Current Topics in Molecular Biology	1 (1-0-2)
MBMG 610	Innovation in Research	1 (1-0-2)
MBMG 614	Analysis of Research Publications for Molecular Bioscience	2 (0-6-2)
MBSB 501	Systems Biosciences	3 (3-0-6)
MBSB 604	Virus-Cell Interactions and Immunity	3 (3-0-6)
GRID 521	Research Ethics	1 (1-0-2)
SCBC 612	Functional Genetics and Genomics	2 (2-0-4)
SCID 500	Cell and Molecular Biology	3 (3-0-6)
SCID 518	Generic Skills in Science Research	1 (1-0-2)

For more details: <https://mb.mahidol.ac.th/en/molecular-genetics-and-genetic-engineering/>

Course Description

(1) Required Courses

Credits (lecture – practice – self-study)

MBMG 500 Essentials in Molecular Biology

2 (2-0-4)

Overview of cell structure and function; structure of nucleic acids; genes and genome organization; DNA replication; transcription; translation; protein structure and function; protein trafficking; isolation, purification and detection of nucleic acids; basic DNA cloning; polymerase chain reaction (PCR) and DNA sequencing; basic protein analysis

MBMG 512 DNA Engineering

2 (1-2-3)

Recombinant DNA techniques; vector and restriction enzymes; in-silico plasmid construction; DNA electrophoresis; DNA ligation; transformation; screening of recombinant clones; plasmid DNA preparation; centrifugation; spectrophotometer; pH meter and biological buffer systems

MBMG 513 Gene Expression and Applications

3 (2-2-5)

Construction of genomic and cDNA libraries; post-transcriptional gene regulation; applications of polymerase chain reaction; DNA marker; genomic DNA analysis; expression systems in bacteria, yeast, plant, and mammalian cells; virus gene structure and regulation; mobile genetic elements; DNA technology in clinical diagnosis; reporter gene detection; transcriptome analysis; computational programs for DNA cloning and analysis

MBMG 514 Protein Structure and Function

3 (2-2-5)

Molecular biology of proteins; PCR-based site-directed mutagenesis; BioEdit for sequence analysis; fluorescence microscopy; DNA sequence analysis; protein chromatography; antibody production; SDS-PAGE and western blot analysis; protein purification; Circular Dichroism spectroscopy; enzyme kinetic assay; Image J; protein-protein interaction; immunoprecipitation assay; Pymol; X-ray crystallography

MBMG 515	Protein Technologies and Applications	2 (1-2-3)
	Proteomics; expression profiling by 2D Electrophoresis; mass spectrometry; bioinformatics tools for proteomic analysis; phage display; protein database and protein visualization; drug design; fluorescent protein technology	
MBMG 516	Cell Technologies and Applications	3 (1-6-4)
	Basic mammalian cell culture technique; biosafety; mammalian cell expression system; RNAi; genome editing; flow cytometry; cell cycle; cellular homeostasis; cytotoxicity; MTT assay; real-time PCR; semi-quantitative PCR; cell applications	
MBMG 521	Molecular Genetics and Genetic Engineering Seminar I	1 (1-0-2)
	Research articles from scientific journals in Molecular Genetics and Genetic Engineering and other disciplines related to the research topic of the student; ethics in research citation	
MBMG 522	Molecular Genetics and Genetic Engineering Seminar II	1 (1-0-2)
	Rationale and research questions; results obtained from student' s research; comparative discussion with previous studies in related topics; ethics in research citation	
MBMG 615	Research Rotations in Molecular Biology	3 (0-9-3)
	Research principles in Molecular Medical and Agricultural Biosciences; searching databases or literature related to the project during each rotation; performing experiments in Molecular Biology with research ethics awareness; responsibility to work assigned; communicating and working with others effectively; planning to achieve goals efficiently; analysis and interpretation of the experimental data; presentation of the results via a short seminar	
MBMG 621	Doctoral Seminar in Molecular Genetics and Genetic Engineering	1 (1-0-2)
	Literature review of the research in the field of interest related to the students' theses; discuss, criticize and make recommendation on further research direction	
MBMG 622	Doctoral Research Seminar in Molecular Genetics and Genetic Engineering	1 (1-0-2)

Compilation and presentation of literatures in Molecular Genetics and Genetic Engineering; results from proposed hypotheses of students' Ph.D. research; ethical research citation

MBMG 623	Advanced Doctoral Research Seminar in Molecular Genetics and Genetic Engineering	1 (1-0-2)
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In-depth analysis of results of students' Ph.D. researches in Molecular Genetics and Genetic Engineering; new concepts or theories from knowledge gained

(2) Elective courses

MBMG 601	Current Topics in Molecular Biology	1 (1-0-2)
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Ethics in Molecular Biology research; interpretation, critical review and discussion of recent publications related to cutting-edge knowledge and technology in Molecular Biology

MBMG 610	Innovation in Research	1 (1-0-2)
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Molecular biosciences-based research and innovation; difference between basic and applied research; benefits of basic research to innovation development; benefits of innovation to society; roles of university in an innovation-driven economy; university spin-off company case studies; entrepreneurship; business model; business pitching

MBMG 614 Analysis of Research Publications for Molecular Bioscience 2 (2-0-4)

Analytical evaluation of current literature in molecular biosciences; oral presentation of scientific papers published within the last two years; writing review reports; assessment by teaching faculty to improve cognitive development

MBSB 501	Systems Biosciences	3 (3-0-6)
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Molecule; cell and systems biosciences; DNA; genome; genomics; genomic data manipulation; RNA and regulations; transcriptomics; transcriptomic data manipulation; protein; proteomics; metabolite; metabolomics; epigenetic; epigenomics; signaling networks; omics biomarkers in translational medicine; research ethics and rationale on systems biosciences

MBSB 603	Molecular Diagnosis and Molecular Therapy	2 (2-0-4)
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Molecular diagnosis; DNA-based diagnosis; RNA-based diagnosis; protein-based diagnosis; clinical biomarkers; prenatal diagnosis; paternity testing; forensic medicine; development of new diagnostic kit; molecular therapy; drug delivery systems; drug carriers and case studies; DNA-based therapy; RNA-based therapy; protein-based therapy; cell-based therapy; development of new therapy

MBSB 604 Virus-Cell Interactions and Immunity 3 (3-0-6)

Virology; RNA viruses; DNA viruses; virus replication; virus attachment and entry virus; integration; intracellular trafficking; virus assembly, maturation and release; viral pathogenesis; cellular responses to viral infection; antiviral agents; vaccinology; vaccine design and development; vaccine trials; vaccine production; storage and quality control

GRID 521 Research Ethics 1(1-0-2)

Regulations of research ethics, authorship, research misconducts; principle of ethics in human research; participant recruitment and informed consent process, vulnerability group and additional safeguard; privacy protection and confidential assurance; welfare, ethics and regulation on animal experimentation; guidance for the care and use of laboratory animal, safety and biosafety guidelines

SCBC 612 Functional Genetics and Genomics 2 (2-0-4)

Functional Genetics; model organisms; genome biology; systems biology; comparative genomics and evolutionary genetics

SCID 500 Cell and Molecular Biology 3 (3-0-6)

Cell structure and function; life and information flow in cell, energy flow in biosystem; cell signaling; cell division; cellular differentiation; cell death and development

SCID 518 Generic Skills in Science Research 1 (1-0-2)

Qualities of a good researcher; effective searching of the scientific information; laboratory safety, biosafety, chemical safety, radiation safety and electrical safety; ethics of research in human subjects and experimental animals in science; intellectual property rights; research

misconduct attribution of credit and responsibility; techniques in formulating and writing thesis proposals, research projects, grant applications, research reports and manuscript for publication

(3) Thesis

MBMG 698	Thesis	12 (0-36-0)
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Research in Molecular Medical and Agricultural Biosciences conducted with strict research ethics awareness under the supervision of the thesis advisory committee; thesis writing; publication of research work in standard journals or a conference's proceedings

MBMG 699	Dissertation	36 (0-108-0)
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MBMG 799	Dissertation	48 (0-144-0)
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MBMG898	Dissertation	48 (0-144-0)
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Literature review on subject related to the student's research; research in molecular genetics and genetic engineering conducted with strict research ethics awareness under the supervision of the thesis advisory committee; thesis writing; publication of research work in international journals

2.3 Faculty

Institute of Molecular Biosciences

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Member of the Administrative Program Committee

3. Appendices

3.1 Program Learning Outcomes (PLOs)

3.1.1 Program Learning Outcomes (Master of Science Program)

At the completion of the program, students will be able to:

- PLO1** Integrate comprehensive knowledge in Molecular Biology and related disciplines to solve scientific research problems.
- PLO2** Conduct systematic research in Molecular Biology with specialized technical skills.
- PLO3** Present research findings in Molecular Biology to scientific community.
- PLO4** Demonstrate scientific integrity including ethical responsibilities and safety practices as appropriate.
- PLO5** Illustrate professional and interpersonal skills for lifelong learning.

3.1.2 Program Learning Outcomes (Doctor of Philosophy Program)

At the completion of the program, students will be able to:

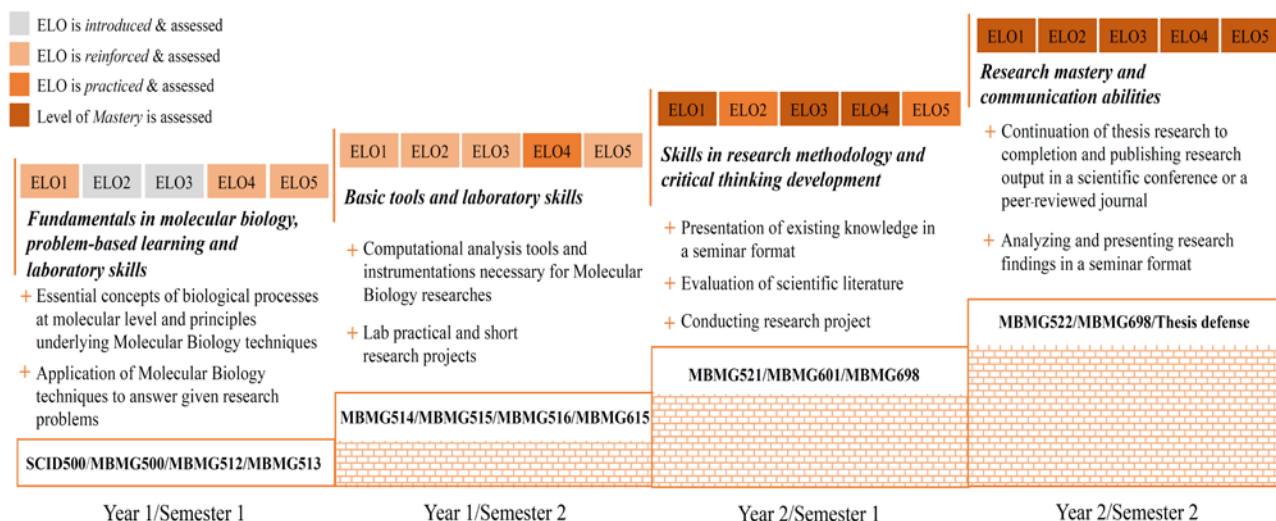
- PLO1** Integrate comprehensive knowledge in Molecular Biology and related disciplines to solve scientific research problems
- PLO2** Formulate and test hypothesis from substantial body of knowledge by independently conducting research in Molecular Biology
- PLO3** Originate new insights in Molecular Biology and research output at international standard
- PLO4** Disseminate novel concepts and/or innovative ideas in Molecular Biology to international scientific community
- PLO5** Demonstrate proficiency in scientific integrity including ethical responsibilities and safety practices as appropriate
- PLO6** Develop professional and interpersonal skills for self-improvement and lifelong learning

3.2 Curriculum Mapping (M.Sc.)

No.	Course code	Course title	Credits (lecture-lab-self study)	PLO1	PLO2	PLO3	PLO4	PLO5
1	MBMG500	Required courses Essentials in Molecular Biology	2(2-0-4)	I			I	
2	MBMG512	DNA Engineering	2(1-2-3)	R	I	I	R	R
3	MBMG513	Gene Expression and Applications	3(2-2-5)	R	I	I	R	R
4	MBMG514	Protein Structure and Function	3(2-2-5)	R	I	I	R	R
5	MBMG515	Protein Technologies and Applications	2(1-2-3)	R	I	I	R	R
6	MBMG516	Cell Technologies and Applications	3(1-6-4)	P	I	I	R	R
7	MBMG521	Molecular Genetics and Genetic Engineering Seminar I	1(1-0-2)	P		R	P	P
8	MBMG522	Molecular Genetics and Genetic Engineering Seminar II	1(1-0-2)	P	R	P	P	P
9	MBMG615	Laboratory Rotations in Molecular Biology	3(0-9-3)	R	R	R	M	R
		Elective courses						
1	MBMG601	Current Topics in Molecular Biology	1(1-0-2)	M		R	R	R
2	SCID500	Cell and Molecular Biology	3(3-0-6)	I				I
3	SCID 518	Generic Skills in Science Research	1(1-0-2)	R	I	I	R	R
4	GRID521	Research Ethics	1(1-0-2)	R			R	R
		Thesis						
	MBMG698	Thesis	12(0-36-0)	M	M	M	M	M

Notes:

I = ELO is introduced & assessed R = ELO is reinforced & assessed
P = ELO is practiced & assessed M = Level of Mastery is assessed



3.3 Curriculum Mapping (Ph.D.)

No.	Course code	Course title	Credits (lecture-lab-self study)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
Required Courses									
1	MBMG 500	Essentials in Molecular Biology	2(2-0-4)	I				R	R
2	MBMG 504	Advanced Research Skills in Molecular Biology	3(0-9-3)	R	P	R	P	P	P
3	MBMG 512	DNA Engineering	2(1-2-3)	R	I			R	R
4	MBMG 513	Gene Expression and Applications	3(2-2-5)	R	I			R	R
5	MBMG 514	Protein Structure and Function	3(2-2-5)	R	I			R	R
6	MBMG 515	Protein Technologies and Applications	2(1-2-3)	R	I			R	R
7	MBMG 516	Cell Technologies and Applications	3(1-6-4)	P	I			R	R
8	MBMG 621	Doctoral Seminar in Molecular Genetics and Genetic Engineering	1(1-0-2)	P			R	P	M
9	MBMG 622	Doctoral Research Seminar in Molecular Genetics and Genetic Engineering	1(1-0-2)	P	R	R	P	M	M
10	MBMG 623	Advanced Doctoral Research Seminar in Molecular Genetics and Genetic Engineering	1(1-0-2)	P	P	R	M	M	M

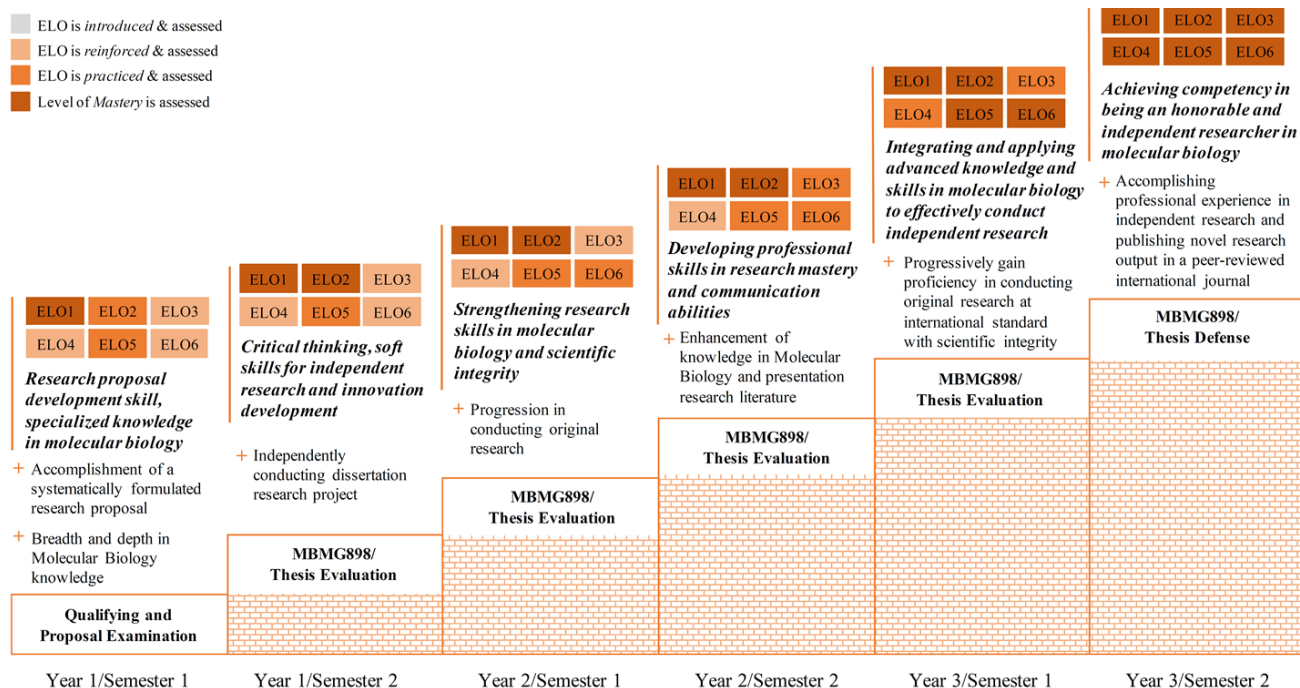
No.	Course code	Course title	Credits (lecture-lab-self study)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
		Elective Courses							
1	MBMG 610	Innovation in Research	1(1-0-2)	R			R	R	P
2	MBMG 614	Analysis of Research Publications for Molecular Biosciences	2(0-6-2)	R	R		R	P	P
3	MBSB 501	Systems Biosciences	3(3-0-6)	R	I			R	R
4	MBSB 603	Molecular Diagnosis and Molecular Therapy	2(2-0-4)	R	I			R	R
5	MBSB 604	Virus-Cell Interactions and Immunity	3(3-0-6)	R	I			R	R
6	SCBC 612	Functional Genetics and Genomics	2(2-0-4)	R	I	R	I	I	
7	SCID 500	Cell and Molecular Biology	3(3-0-6)	I				I	
8	SCID 518	Generic Skills in Science Research	1(1-0-2)			I	I	R	R
		Dissertation							
1	MBMG 699	Dissertation	36 (0-108-0)	M	M	M	M	M	M
2	MBMG 799	Dissertation	48 (0-144-0)	M	M	M	M	M	M
3	MBMG 898	Dissertation	48 (0-144-0)	M	M	M	M	M	M

Notes:

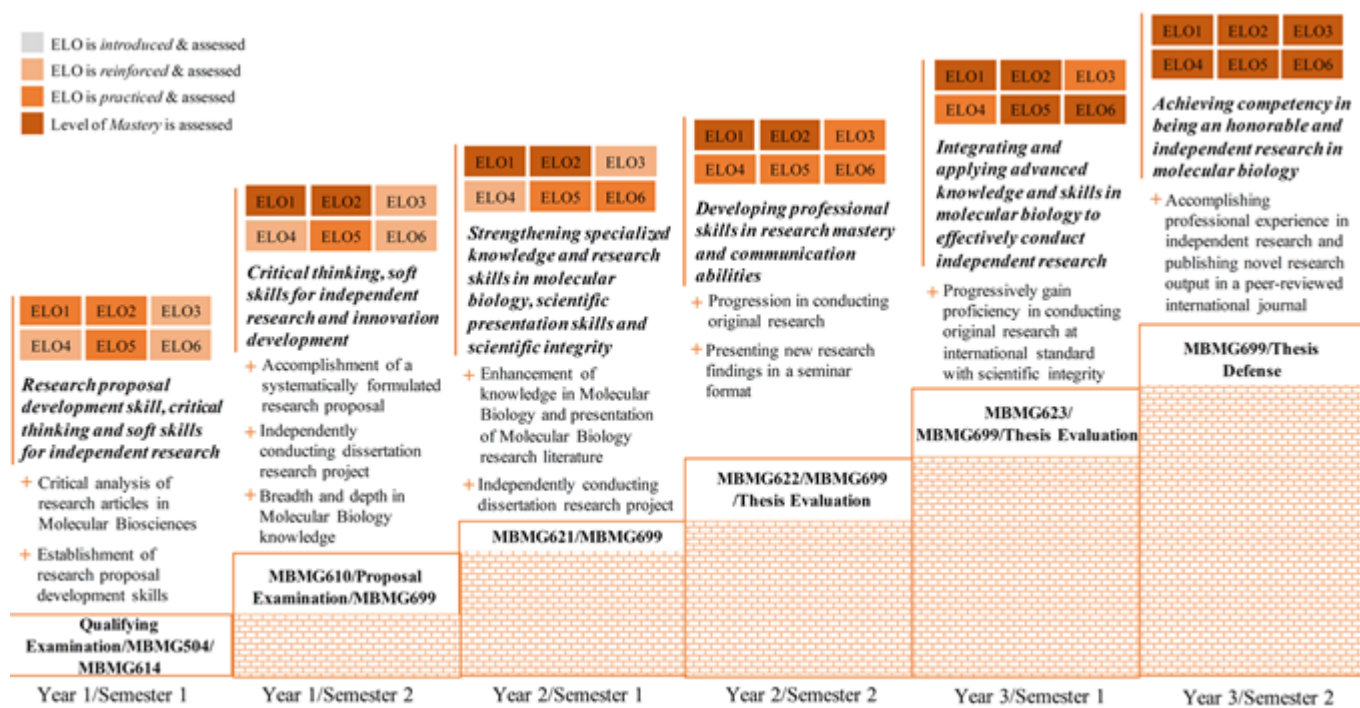
I = ELO is introduced & assessed R = ELO is reinforced & assessed

P = ELO is practiced & assessed M = Level of Mastery is assessed

Plan 1



Plan 2.1

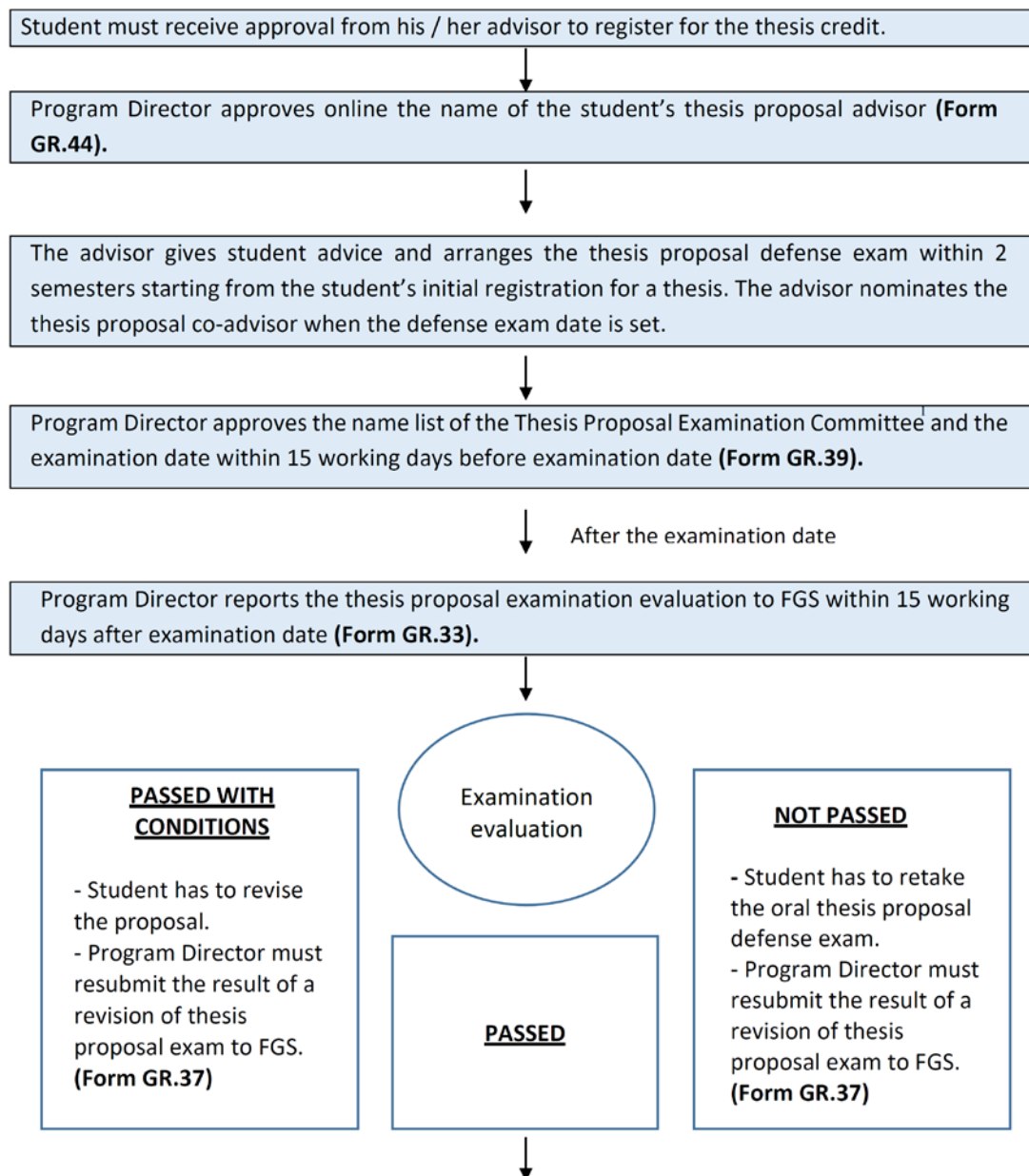


Plan 2.2

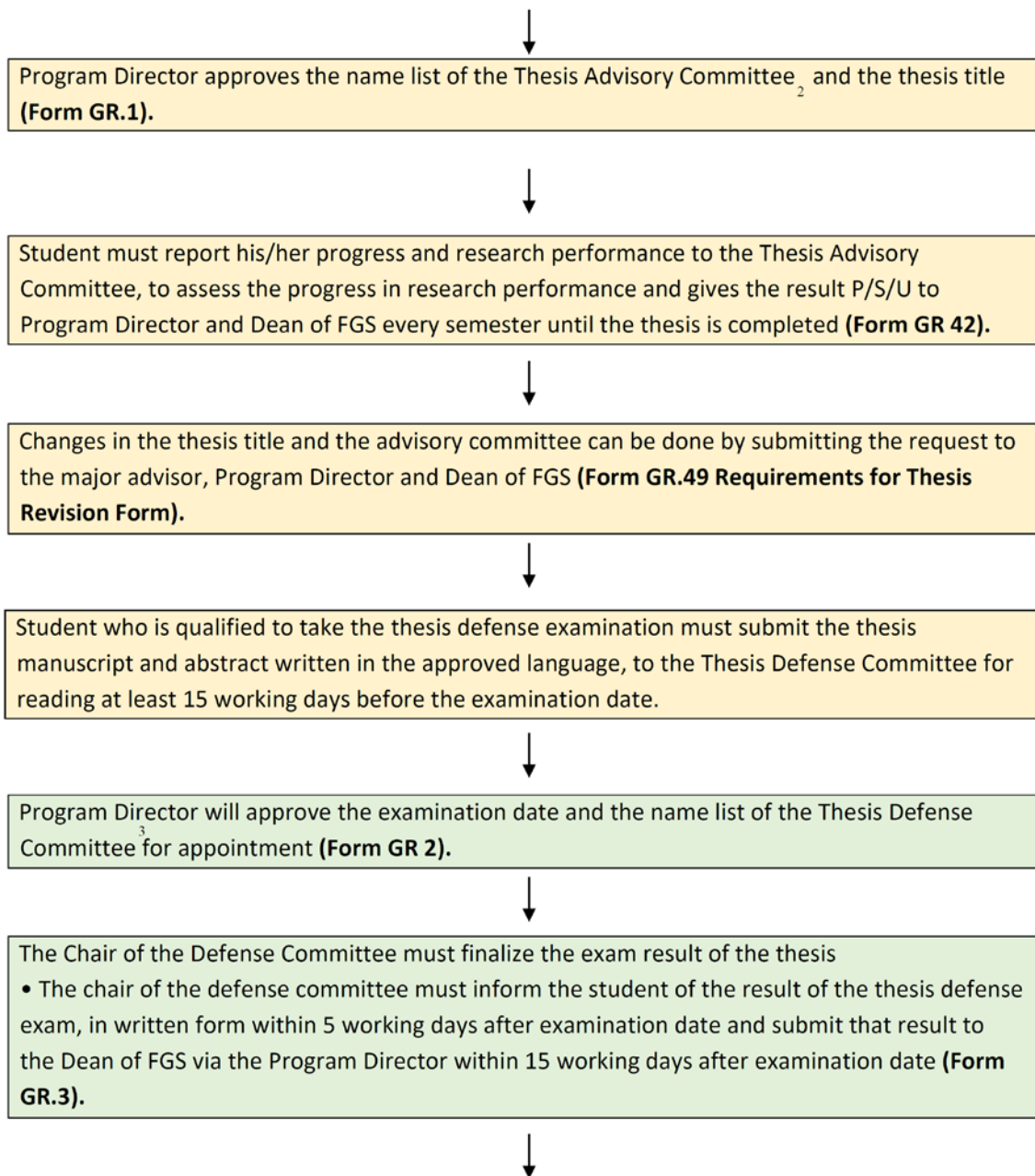
<p>ELO is introduced & assessed</p> <p>ELO is reinforced & assessed</p>		<p>ELO is practiced & assessed</p> <p>Level of Mastery is assessed</p>		<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Research proposal development skill, critical thinking and soft skills for independent research</p> <p>+ Critical analysis of research articles in Molecular Biosciences.</p> <p>+ Establishment of research proposal development skills</p> <p>+ Breadth and depth in Molecular Biology knowledge</p> <p>MBMG504/MBMG614/Qualifying Examination</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Critical thinking, soft skills for independent research and innovation development</p> <p>+ Development of a model of innovative products from research</p> <p>+ Accomplishment of a systematically formulated research proposal</p> <p>+ Independently conducting dissertation research project</p> <p>MBMG610/MBMG799/Proposal Examination</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Strengthening specialized knowledge and research skills in molecular biology, scientific presentation skills and scientific integrity</p> <p>+ Enhancement of knowledge in Molecular Biology and presentation of Molecular Biology research literature</p> <p>+ Independently conducting dissertation research project</p> <p>MBMG621/MBMG799</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Developing professional skills in research mastery and communication abilities</p> <p>+ Progression in conducting original research</p> <p>+ Presenting new research findings in a seminar format</p> <p>MBMG622/MBMG799</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Integrating and applying advanced knowledge and skills in molecular biology to effectively conduct independent research</p> <p>+ Progressively gain proficiency in conducting original research at international standard with scientific integrity</p> <p>MBMG623/MBMG799/Thesis Evaluation</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Achieving competency in being an honorable and independent research in molecular biology</p> <p>+ Accomplishing professional experience in independent research and publishing novel research output in a peer-reviewed international journal</p> <p>MBMG799/Thesis Defense</p>		
<p>ELO1 ELO2</p> <p>ELO5 ELO6</p> <p>Fundamentals in molecular biology and essential laboratory skills</p> <p>+ Essential concepts of biological processes at molecular level</p> <p>+ Principles underlying Molecular Biology techniques and lab practical</p> <p>SCID500/MBMG500/MBMG512/MBMG513</p>		<p>ELO1 ELO2</p> <p>ELO5 ELO6</p> <p>Advanced knowledge and laboratory skills in molecular biology, presentation and communication skills</p> <p>+ Principles and applications of advanced techniques in Molecular Biology</p> <p>+ Lab report writing and presentation</p> <p>MBMG514/MBMG515/MBMG516</p>		<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Research proposal development skill, critical thinking and soft skills for independent research</p> <p>+ Critical analysis of research articles in Molecular Biosciences.</p> <p>+ Establishment of research proposal development skills</p> <p>+ Breadth and depth in Molecular Biology knowledge</p> <p>MBMG504/MBMG614/Qualifying Examination</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Critical thinking, soft skills for independent research and innovation development</p> <p>+ Development of a model of innovative products from research</p> <p>+ Accomplishment of a systematically formulated research proposal</p> <p>+ Independently conducting dissertation research project</p> <p>MBMG610/MBMG799/Proposal Examination</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Strengthening specialized knowledge and research skills in molecular biology, scientific presentation skills and scientific integrity</p> <p>+ Enhancement of knowledge in Molecular Biology and presentation of Molecular Biology research literature</p> <p>+ Independently conducting dissertation research project</p> <p>MBMG621/MBMG799</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Developing professional skills in research mastery and communication abilities</p> <p>+ Progression in conducting original research</p> <p>+ Presenting new research findings in a seminar format</p> <p>MBMG622/MBMG799</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Integrating and applying advanced knowledge and skills in molecular biology to effectively conduct independent research</p> <p>+ Progressively gain proficiency in conducting original research at international standard with scientific integrity</p> <p>MBMG623/MBMG799/Thesis Evaluation</p>			<p>ELO1 ELO2 ELO3</p> <p>ELO4 ELO5 ELO6</p> <p>Achieving competency in being an honorable and independent research in molecular biology</p> <p>+ Accomplishing professional experience in independent research and publishing novel research output in a peer-reviewed international journal</p> <p>MBMG799/Thesis Defense</p>		
Year 1/Semester 1		Year 1/Semester 2		Year 2/Semester 1			Year 2/Semester 2			Year 3/Semester 1			Year 3/Semester 2			Year 4/Semester 1			Year 4/Semester 2		

3.4 Students' Thesis Process

Steps for Thesis Process (Master's Degree Program)



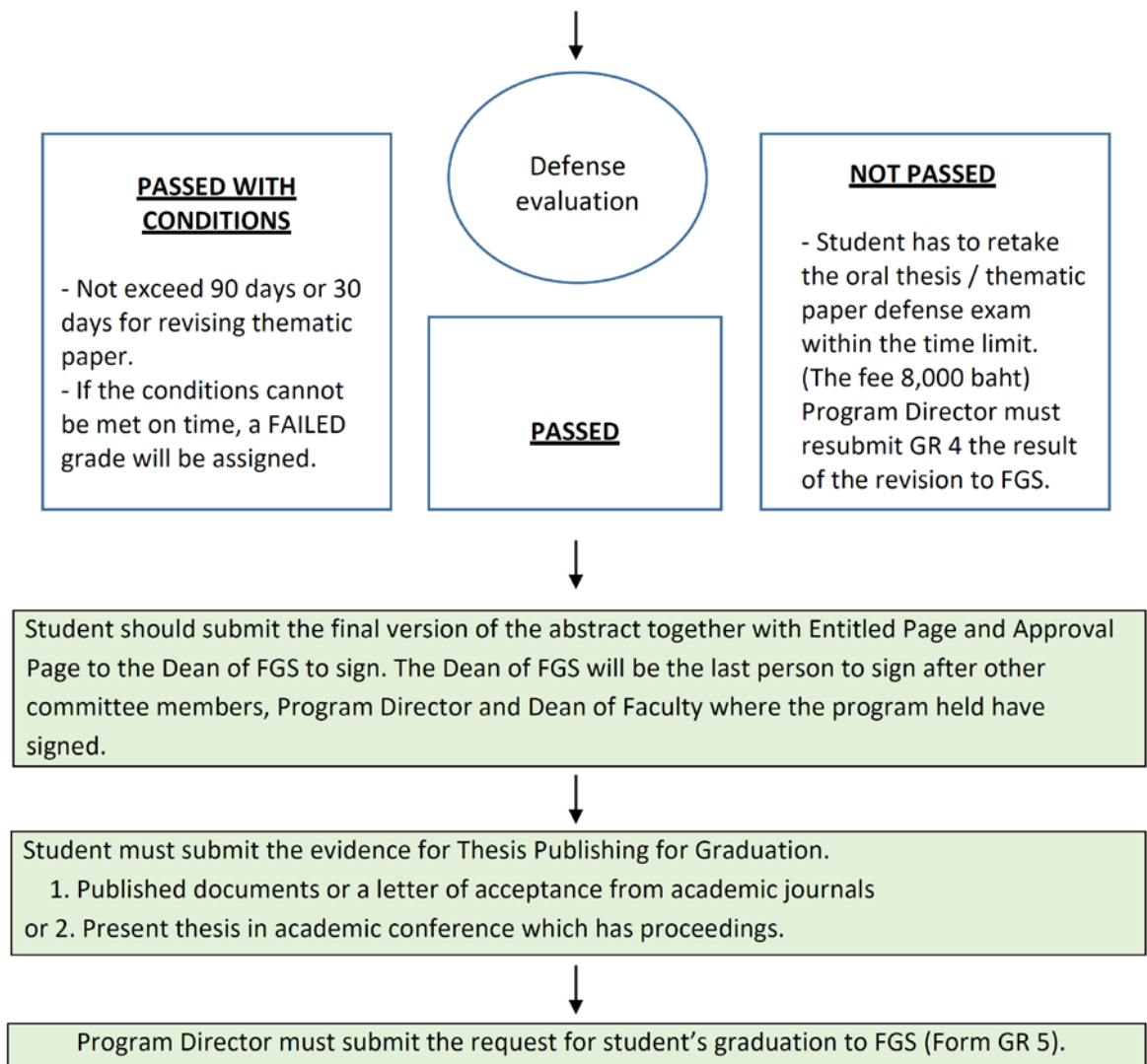
¹ Number of committee members is at least 3 members, the chair of the committee must be a thesis proposal advisor, and the member must be a regular instructor or external examiner.



² The Thesis Committee consists of at least 3 committee members

(1) major advisor (2) at least two co-advisors who are regular instructor or external person with Ph.D degree or have at least an academic title of no less than an associate professor.

³ The Thesis Defence Examination Committee consists of at least 3 committee members (1) major advisor (2) at least one external examiner and (3) co-advisor or a program instructor.



Steps for Thesis process (Doctoral Degree Program)

Program Director submits the name list of the Qualifying Examination Committee consisting of 4 members and sets up the examination date to FGS within 15 working days before examination date **(Form GR.35)**.

↓ After the examination date

Program Director reports the Qualifying exam evaluation to FGS within 15 working day after examination date **(Form GR.38)**.

↓ Student registers for the thesis credit after receiving the approval

Program Director approves the name of the student's thesis proposal advisor **(Form GR.44)**.

↓

The thesis proposal advisor gives student advice and arranges the thesis proposal defense exam (within 2 semesters starting from the student's initial registration for a thesis). The thesis proposal advisor nominates the thesis proposal co-advisors when the defense exam date is set.

↓

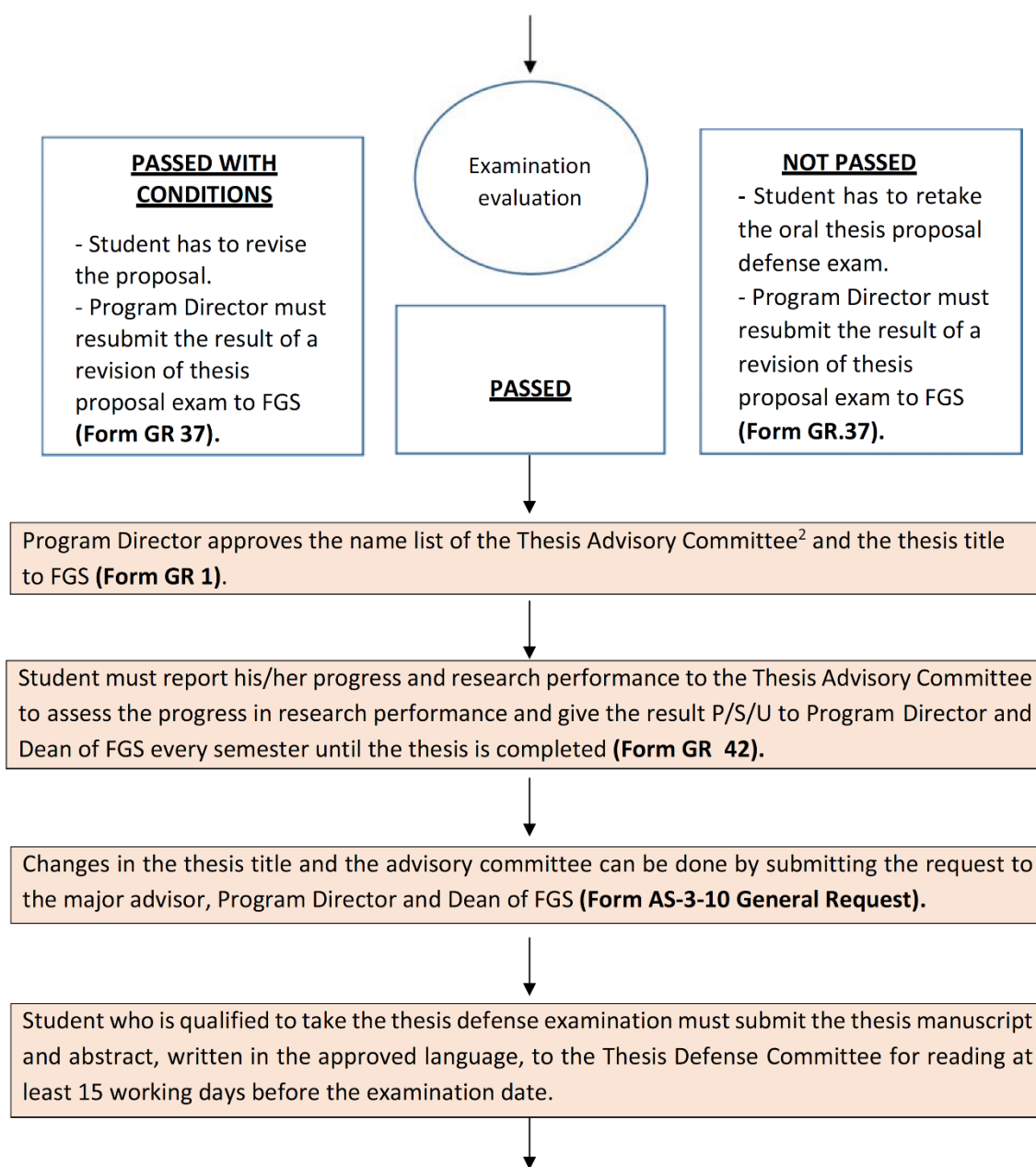
Program Director approves the name list of the Thesis Proposal Examination Committee¹ and the examination date within 15 working days before examination date **(Form GR.39)**.

↓ After the examination date

Program Director reports the thesis proposal examination evaluation to FGS within 15 working days after examination date **(Form GR.33)**.

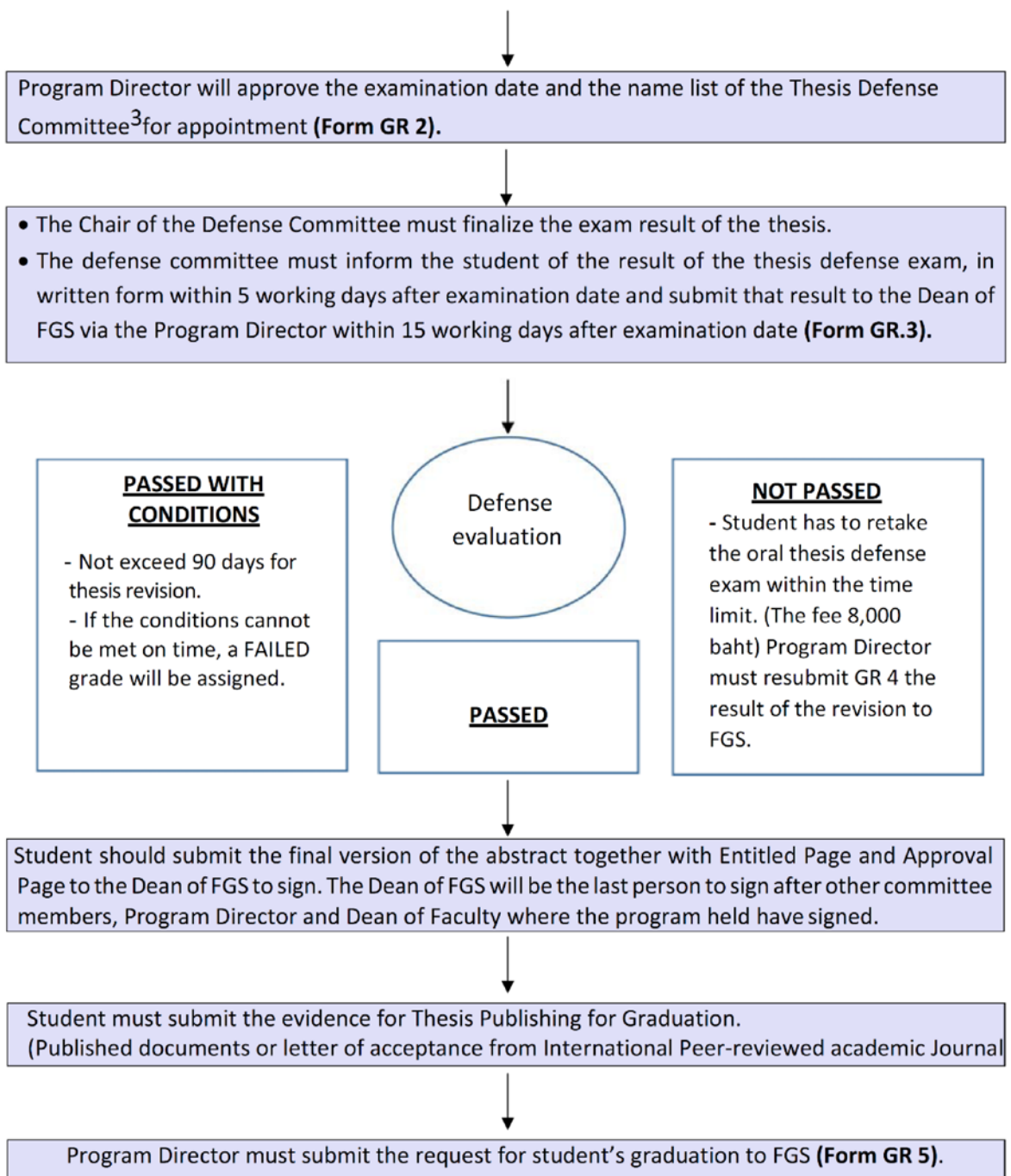
↓

¹ Number of committee members is at least 4 members. The chair of the committee must be a thesis proposal advisor, and the member must be a regular instructor or external examiner.



² The Thesis Committee consists of at least 4 committee members

(1) major advisor (2) at least three co-advisors who are regular instructor or external person with Ph.D degree or have at least an academic title of no less than an associate professor.



³ The Thesis Defense Examination Committee consists of at least 5 committee members (1) major advisor (2) at least one external examiner as the chair and (3) co-advisors or program instructors.

Course Registration and Fee Payment for Graduate Students, Academic Year 2022

Faculty of Graduate Studies, Mahidol University

Registration Process		1 st Semester	2 nd Semester	Summer
1	Semester start and end dates	Aug 8 - Dec 2, 2022	Jan 9 - May 5, 2023	May 22 - Jul 14, 2023
2	Consultations with advisors for course registration approval (Regarding course registrations deviating from study plans, a request must be approved prior to registration.)	From Jun 6, 2022	From Nov 7, 2022	From Apr 18, 2023
3	Pre-registration (For master's degree students)	Jun 6 - Jun 24, 2022	Nov 7 - Nov 25, 2022	Apr 18 - Apr 24, 2023
4	Registration period via Student Service System on https://graduate.mahidol.ac.th and registration fee payment			
	4.1 Regular registration	Jul 4 - Jul 15, 2022	Dec 5 - Dec 16, 2022	May 1 - May 5, 2023
	4.2 Last day of payment for tuition fees during the regular registration period (If the payment is made after this deadline, the students will be charged 2,000 baht for late registration.)	Aug 5, 2022 (before 10:00 p.m.)	Jan 6, 2023 (before 10:00 p.m.)	May 19, 2023 (before 10:00 p.m.)
	4.3 Late registration (The students will be charged for 2,000 baht)	Aug 8 - Aug 19, 2022	Jan 9 - Jan 20, 2023	May 22 - May 26, 2023
	4.4 Add/Drop course registration (Tuition fee refund for course dropping)			
	4.5 Submission of credit refund request form for the dropped course(s) (during Add/Drop registration period) Remarks: The refund request must be proceeded within the specified period. All requests submitted after the specified period will not be considered.	Aug 8 - Sep 9, 2022	Jan 9 - Feb 10, 2023	May 22 - Jun 9, 2023
	4.6 Last day of payment for tuition fees and fines for late registration (The students will be charged for 2,000 baht)	Sep 9, 2022 (before 10:00 p.m.)	Feb 10, 2023 (before 10:00 p.m.)	Jun 9, 2023 (before 10:00 p.m.)
	4.7 Course withdrawal (No refund)	Aug 20 - Nov 25, 2022	Jan 21 - Apr 28, 2023	May 27 - Jul 7, 2023
5	Advisor or program director's approval notice toward the registration results	Within 7 days after receiving student registration request		
6	Invoice and course list will be informed via e-mail to each student. The students can download and print out the invoice for payment to be proceeded at bank counters or through electronic channels.			
	6.1 Regular Registration	12 days after student registration request		
	6.2 Late Registration			
	6.3 Add/Drop Course Registration			
7	Announcement of student enrollment's list and payment status on https://graduate.mahidol.ac.th (Student Service System)	From Jul 18, 2022	From Dec 19, 2022	From May 8, 2023
8	The Faculty of Graduate Studies submits the list of students who do not register for courses or register without the tuition fee payment for student status suspension.	Oct 10, 2022	Mar 13, 2023	—
9	Course evaluation	Nov 14 - Dec 26, 2022	Apr 17 - May 29, 2023	Jun 12 - Jul 24, 2023
10	Submission of course evaluation summary for the semester to FGS	Dec 5 - Dec 23, 2022	May 8 - May 26, 2023	Jul 17 - Jul 21, 2023
11	Grade Report announcement on https://graduate.mahidol.ac.th (Student Service System)	From Dec 24, 2022	From May 27, 2023	From Jul 22, 2023

3.6 Announcements



Mahidol University Institute of Molecular Biosciences

Post-graduate Programs in Molecular Genetics and Genetic Engineering
Institute of Molecular Biosciences
Mahidol University

Criteria for the change in M.Sc. student status

The Institute Curriculum Committee has announced the following criteria for M.Sc. student who wishes to bypass to Ph.D. study program:

1. The student must attend at least a full year of course work and pass the required first-year course work which are: MBMG 500 Essentials in Molecular Biology, MBMG 512 DNA Engineering, MBMG 513 Gene Expression and Applications, MBMG 514 Protein Structure and Function, MBMG 515 Protein Technologies and Applications, MBMG 516 Cell Technologies and Applications and MBMG 615 Research Rotations in Molecular Biology
2. The change from M.Sc. to Ph.D. status must be made within one year after starting a research thesis, and must be approved by the Institute Curriculum Committee according to the following considerations:
 - 2.1 A reason for switching from M.Sc. to Ph.D. program.
 - 2.2 Demonstrated academic and research abilities. The student must have at least a GPA of 3.5 in the first year of course work.
 - 2.3 If the student has a scholarship under the major advisor's project, the student will not be allowed to change the thesis major advisor unless an agreement is made between the student and the major advisor.
3. The student must pass an interview by the examination committee which will be appointed by the chair of the Curriculum Committee. The student must contact the MGGE educational office at least 2 weeks in advance.

This announcement will be effective from April 4, 2018.

A handwritten signature in blue ink, appearing to read "P. Boon".

Assoc. Prof. Dr. Panadda Boonserm
Program Director



Mahidol University Institute of Molecular Biosciences

Post-graduate Programs in Molecular Genetics and Genetic Engineering Institute of Molecular Biosciences Mahidol University

Guidelines for students' thesis research

M.Sc. students

1. The student must complete the M.Sc. program within three years. The third-year student must appoint the thesis defense committee before the deadline for graduation of that academic year. The appointment for thesis examination date must be made before the advisor can submit thesis proposal for the next-year student.
2. The student must pass the Thesis Proposal Examination within the first semester after registered for the thesis.
3. At least 60% of the student's research time must be carried out at the Institute.
4. Each student must be evaluated for the progress of his/her research every semester.
5. The M.Sc. thesis or part of it must be presented at the conference with a peer review process and have a full proceeding (with the student's name as the first author and the major advisor as a corresponding author) or published in a peer-reviewed international journal (with the student's name as an author and the major advisor as the first or corresponding author).
6. A student can submit his/her thesis for publication only after his/her thesis topic has been approved by the Faculty of Graduate Studies.

Ph.D. students

1. The student must pass the Qualifying Examination within two semesters (for students with a Master's degree) or four semesters (for students with a Bachelor's degree) after officially enrolled.
2. The student must pass the Qualifying Examination before being allowed to register for Thesis.
3. The student must take the Thesis Proposal Examination within two semesters after registered for the thesis.
4. Students with a Master's degree cannot take more than 4 years and students with a Bachelor's degree cannot take more than 6 years to complete their study.
5. At least 60% of the student's research time must be carried out at the Institute.
6. Each student must be evaluated for the progress of his/her research thesis every semester. This evaluation may be omitted during the period of student's overseas training with the consent from the Administrative Program Committee. This omission will be allowed only once in the entire period of Ph.D. thesis.
7. Publication for graduation of Ph.D. students must have student's name as the first author and the thesis major advisor as a corresponding author (For the first publication: student's name as the first author and major advisor as the corresponding author, For the second publication: student's name as the first author and major advisor as the corresponding author or co-author). Student can take the Thesis Defense Examination when at least one publication is accepted for publication. The publication must be related to the thesis, and the date of publication must be after taking the Thesis Proposal Examination.
8. A student can submit his/her thesis for publication only after his/her thesis topic has been approved by the Faculty of Graduate Studies.

This announcement is to be effective from April 4, 2018.

Assoc. Prof. Dr. Panadda Boonserm
Program Director



Mahidol University

Institute of Molecular Biosciences

Doctor of Philosophy program in Molecular Genetics and Genetic Engineering

Institute of Molecular Biosciences

Mahidol University

Qualifying Examination

Objectives

The purpose of the qualifying examination is to assess whether the student has adequate knowledge in the field of study to begin a Ph.D. thesis research. This will be determined by testing both fundamental knowledge related to the student's research and the oral communication skill.

Prerequisite

Students who wish to take qualifying examination must complete all the first-year course work.

Format

Students will be tested on fundamentals of their research field. The examination will be composed of a 30 minutes student's presentation on the research background and literature reviews followed by a questioning session from the Qualifying Committee and participating faculty members.

Before the exam, the students must

1. notify their intention to take the qualifying exam and appoint the exam date with the program director one month in advance. The Qualifying Examination Committee, composing of four faculty members for each student, will be appointed by the program director for each student.
2. submit the abstract (not exceed 250 words) and copies or PDF of at least three research articles to each committee member two weeks ahead of the exam.

Evaluation

The examination will be evaluated by the Qualifying Committee, and the student will be informed of the result after the exam.

Students who do not pass the exam must retake the exam within six months with the same Qualifying Examination Committee. Students who fail the second qualifying examination will be retired or will be asked to change the status from Pd.D. to Master's student.

This announcement will be effective from July 21, 2017

A handwritten signature in blue ink, reading "P. Boonserm".

Assoc. Prof. Dr. Panadda Boonserm

Program Director



Mahidol University
Institute of Molecular Biosciences

Post-graduate Programs in Molecular Genetics and Genetic Engineering
Institute of Molecular Biosciences
Mahidol University

Criteria for Evaluating Students' Studies

This is to inform all MGGE students of the decision made by the Graduate Programme Committee from the meeting on May 3, 2016. The establishment of criteria for evaluating students' studies is intended to maintain a high standard of the programme in Molecular Genetics and Genetic Engineering.

The criteria are as follows:

1. Students who have attended class regularly and taken examinations, or unreasonably missed the final test will be graded as a normal rating and will not receive an "I" (Incomplete).
2. In the case of MGGE scholars, if they have received a grade lower than "B" for a required course, their scholarships will be terminated and consequently
 - 2.1 they must pay graduate tuition at a normal rate of 18,000 ฿ per credit for the following semester;
 - 2.2 they must pay the Research Supplies Fee of 150,000 ฿ for a research M.Sc. thesis;
 - 2.3 they must pay the Research Supplies Fee of 300,000 ฿ for a research Ph.D. thesis.
3. Students who could not pass a required course after the second attempt will be terminated from the programme.
4. Students who have received a grade lower than "B" for two required courses will not be allowed to perform the thesis research.
5. Students who have received a "U" rating for two semesters of the research performance must withdraw from the programme.
6. Changing of the above criteria can only be performed by the Graduate Programme Committee.

This announcement will be effective from July 21, 2017.

A handwritten signature in blue ink, reading "P. Boonserm".

Assoc. Prof. Dr. Panadda Boonserm
Program Director



Guidelines for Thesis Examination and Graduation
Institute of Molecular Biosciences Mahidol University

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This announcement is to ensure that the post-graduate programs of the Institute of Molecular Biosciences are moving in the same direction and conform to the standard criteria for graduate studies of the Office of the Higher Education Commission. By the virtue of section 37 of Mahidol University Act B.E. 2550 and with the resolution of the Institute of Molecular Biosciences Administrative Committee in the meeting no. 46-9/2563 on 3rd September B.E. 2563, and the Institute of Molecular Biosciences Committee in the meeting no. 53-4/2564 on 19th April B.E. 2564, the Director of the Institute of Molecular Biosciences stipulated the following guidelines

1. Guidelines for getting students to publish research articles within a time frame after their thesis defense

1.1 Master program:

Student must have presented at least a peer-reviewed proceeding at an academic conference before s/he can schedule for a thesis defense examination.

1.2 Doctoral programs:

Plan 1 and plan 2.1 and 2.2 that require 2 papers for graduation (e.g. RGJ students)

Student must have submitted the first manuscript (“under review” status), and the draft of the second manuscript must be submitted to the Curriculum Executive Committee for approval before appointing the thesis defense committee. Both manuscripts must be accepted for publication within 1 year of the passing date of the defense examination. The progress of the manuscripts shall be reported to the Program Executive Committee every 3 months.

/Plan 2.1...

Plan 2.1 and 2.2

Student must have submitted a manuscript (“under review” status) before setting up his/her thesis defense examination. The manuscript must be accepted for publication within 1 year of the passing date of the examination. The progress of the manuscript shall be reported to the Program Executive Committee every 3 months.

*The manuscript must be submitted to a journal approved by the Faculty of Graduate Studies, and in the case whereby the student receives a scholarship, the funding agency’s as well.

The above guideline shall apply to all students enrolled in the revised curriculum

2. Guidelines for getting students to complete their studies according to the structure of the programs.

In order to standardize and monitor the progress of students' thesis, the Program Director/Program Secretary or a person assigned by the Curriculum Executive Committee will attend and observe the assessment of the student's thesis progress and research performance, but will not be involved in the thesis evaluation. However, he or she can give feedbacks to the Program Director in cases whereby the students are unlikely or unable to graduate according to the time frame of the program structure.

3. The responsibility of major advisor

Any major advisor who has Ph.D. students or M.Sc. students under the extension of their study period according to the program structure will not be allowed to accept any more students in that program.

Any exception to the above requirements shall be under the discretion of the Program Executive Committee.

This announcement shall be effective from now onwards

Announced on May, 12 B.E. 2564



(Prof. Narattaphol Charoenphandhu, M.D., Ph.D.)

Director, Institute of Molecular Biosciences

3.7 Laboratory guidelines

Your actions and behavior in the laboratory should reflect an attitude of professional concern and commitment to excellence. Cooperation and communication with your colleagues is essential. We will all learn more if we work in an atmosphere of cooperation rather than competition. Materials, supplies, and equipment are often limited so use only what is needed. Please return supplies to their proper places as soon as you have finished with them.

1. Laboratory coats must be worn in the radioactive laboratory and should be worn while performing any bench work.
2. Gloves may be contaminated so do not wear them to answer the telephone or to open a door while walking through the Institute.
3. Closed-in shoes must be worn in the laboratory.
4. Equipment must not be used until you have been properly trained in its use.
5. Special permission must be obtained to work outside the normal working hours of Monday - Friday 0800-2000 hr.
6. Eating and drinking are NOT allowed in the laboratory.
7. In the laboratories performing genetic manipulation experiments, the windows and doors must remain closed to prevent cross-contamination.
8. If equipment is broken or reagents consumed, please inform the appropriate people.
9. The computers must only be used for research purposes and NOT for playing games.
10. When borrowing equipment or reagents from other laboratories, please inform people in that laboratory BEFORE taking the material.
11. Return the material that you borrowed to the laboratory from where it came.
12. Students must be dressed politely when attending courses.
13. Dishonesty and unethical behavior including plagiarism and fraudulent manipulation of data will not be tolerated.
14. Students breaking the above rules are subject to dismissal from the program.

3.8 Professional and Personal Skills Development

At present, it is widely accepted that successful students both in work and personal life have some knowledge they acquire outside of school. Since Professional and Personal Skills Development or Soft skills are as important as the knowledge in school, the dean of the Faculty of Graduate Studies, with the approval of the Faculty of Graduate Studies policy committee, saw it beneficial to provide Soft Skills development to students in the graduate programs in order to comply with the Faculty of Graduate Studies' strategies that develop the graduates' qualities to meet the international standards. The Deputy Dean for Student Affairs formed the student affairs committee consisting of representatives of all sections to set up Soft Skills development guideline under the project – Professional and Personal Skills Development.


The standard professional and personal skills required for the graduate students in Mahidol University are:

1. Communication and Language Skills
2. Leaderships and Management skills
3. Creative and Innovative Skills (For students with ID 61 onwards)
4. Digital Literacy Skills
5. Health Literacy Skills (For students with ID 62 onwards)
6. Entrepreneurial Literacy Skills (For students with ID 62 onwards)

Policies

- Graduate students with student ID no. 59xxxxx and later must pass the Professional and Personal Skills Development to qualify for graduation. Every candidate student must pass at least 1 activity in every required skills.
- The activity students take part in will be reported in their transcript.
- Students will get a certificate for every activity attended.
- Students can register for the activities through the website which will have a schedule of activities for the students to choose.
- If the students' program has activities or courses that are similar to the required skills in this project, they can send a request form to the student affairs committee under the committee's agreement meeting will be held every 2 months.
- The maximum of comparable skills in the students' program are 2 skills, one of which the student shall take in the Faculty of Graduate Studies.

3.9 Appeal Procedure




Mahidol University
Institute of
Molecular Biosciences

Complaints and Appeals Process

Institute of Molecular Biosciences

Complaint/Appeal relates to the following:

1. Academic/Support staff
2. Graduate Programs/ Services
3. Comments/suggestion



Complaints/Appeals Form contains:


1. Name, Surname, Address, telephone number
2. Complaint/Appeal issue
3. Polite contents
4. Signature at the end of the form

The following items will not be considered:

1. Thailand's monarchy
2. Policy of the Thai Government
3. Judicial process
4. No signature/ Items that cannot be traced
5. Complaints that have already been considered by the Government

Procedures

1. Obtain Complaints/Appeals Form from the MB Legal Affairs Division or download from the MU Legal Affairs Division website
2. Submit the signed completed form by post or e-mail **Or**
3. Submit the form in MB Suggestion Box at the **1st floor in front of the meeting rooms or the 3rd floor in front of the library**



**WE
EMB**

For more information, please contact
Ms.Issariya Dissariyawongwarang Ext. 1451

3.10 Course Schedule 2022

Course (coordinator)	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
MBMG 500 Essentials in Molecular Biology (Apinunt)	2 Aug - 25 Aug Mon, Tue, Thu: 9.00-15.30									
MBMG 512 DNA Engineering (Chalernporn)		5 – 23 Sep Mon-Fri 9.00-16.00								
MBMG 513 Gene Expression and Applications (Kusol)		26 Sep – 28 Oct Mon-Fri 9.00-16.00								
MBMG 514 Protein Structure and Function (Panadda)			7 Nov – 25 Nov Mon-Fri 9.00-16.00							
MBMG 515 Protein Technologies and Applications (Chalongrat)					28 Nov - 16 Dec Mon-Fri: 9.00-16.00					
MBMG 516 Cell Technologies and Applications (Saovaros)						3 -27 Jan Mon-Fri: 9.00-16.00				
MBMG 615 Research Rotations in Molecular Biology (Poochit)							Rotation I 30 Jan – 24 Feb	Rotation II 27 Feb – 24 Mar	Rotation III 27 Mar-21 Apr	
MBMG521, 522 Mol Genet & Genet Eng Seminar I, II (Sarin, Kanokporn)	To be announced Fri: 10.00-11.30									
MBMG601 Current Topics in Mol Biol (Duangrudee)			5 Oct–30 Nov Wed: 9.30-11.30							
MBMG504 Adv Res Skill in Mol Biol (Chalernporn)		8 Aug – 25 Oct								
MBMG621, 622, 623 Doctoral Seminar (Kusol, Duncan)	To be announced									
MBMG614 Analysis of Res Publication for Mol Biosci (Chartchai)		4 Aug – 24 Nov Th: 10.00-12.00								
MBMG 610 Innovation in Research (Surapon)						3 Jan – 25 Apr				

SCID500 Cell Mol Biol
TBA

M.Sc./Yr 1

M.Sc./Yr 2

Ph.D.



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