PROGRAM INFORMATION

M.Sc. Program in Medical Microbiology (International Program)
- Eligibility
- Requirement for graduation
- Suggested study plan

Ph.D. Program in Medical Microbiology (International Program)
- Eligibility
- Requirement for graduation
- Suggested study plan
COURSE INFORMATION

Required courses
- Course credit
- Course description

Elective courses
- Course credit
- Course description

THESIS INFORMATION

Thesis proposal
- Components

Thesis
- Thesis format and components
- Thesis steps
**PROGRAM INFORMATION**

**DURATION**: approximately 3-5 academic years

**ELIGIBILITY**:  
- Applicants must hold Bachelor or Master Degree in biological science, pharmacy, health science, nurse education, medical technician education, medicine, dental medicine and veterinary medicine or other related fields.  
- Applicants must have a cumulative GPA of >2.5.

* The maximum allowed time frame is 5 years.  
**Exception may be individually considered by the Program Committee.
## REQUIREMENT FOR GRADUATION

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Required courses</strong></td>
<td>13</td>
</tr>
<tr>
<td><strong>Elective courses</strong></td>
<td>≥ 11</td>
</tr>
<tr>
<td><strong>Thesis</strong></td>
<td>12</td>
</tr>
<tr>
<td><strong>Total credits required</strong></td>
<td>≥ 36</td>
</tr>
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</table>
# Suggested Study Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>summer</td>
<td>SIID501 Molecular and Cellular basis of biomedicine</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td>1</td>
<td>1st</td>
<td>SIMI512 Medical Bacteriology and Mycology*</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIMI513 Medical Virology*</td>
<td>2 (2-0-4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIIM501 Immunology</td>
<td>2 (2-0-4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIBC504 Biochemistry</td>
<td>4 (4-0-8)</td>
</tr>
<tr>
<td>1</td>
<td>2nd</td>
<td>SIMI611 Molecular Techniques in Medical Microbiology</td>
<td>3 (2-3-5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIMI615 Fundamental of Diagnostic Microbiology</td>
<td>1 (1-0-2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIMI616 Diagnostic Microbiology*</td>
<td>3 (1-6-4)</td>
</tr>
</tbody>
</table>

*Required courses
## Suggested Study Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>summer</td>
<td>SIMI613 Advanced Medical Virology*</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or SIMI617 Advanced Medical bacteriology and Mycology*</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td>2</td>
<td>1st</td>
<td>SIMI698 Thesis</td>
<td>6 (0-18-0)</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>SIMI687 Microbiology Seminar**</td>
<td>1 (2-0-4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIMI699 Thesis</td>
<td>1 (1-0-2)</td>
</tr>
</tbody>
</table>

*Student should register for either SIMI613 or SIMI617 based on thesis area.**

**Required course
**Doctor of Philosophy in Medical Microbiology**

**General Information**

**Duration**: approximately 5-6 academic years

**Eligibility**:  
- Applicants must hold Bachelor or Master Degree in biological science, pharmacy, health science, nurse education, medical technician education, medicine, dental medicine and veterinary medicine or other related fields.

- Applicants with Master’s Degree or Bachelor’s Degree must have a cumulative GPA of >3.25 or >3.5, respectively.

*The maximum allowed time frame is 8 years for student who enters program with Bachelor degree (plan 1) and 6 years for student who enters program with Master degree (plan 2).**

**Exception may be individually considered by the Program Committee.**
Plan 1: For student who enters program with Bachelor degree

### Requirement for Graduation

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required courses</td>
<td>-</td>
</tr>
<tr>
<td>Elective courses</td>
<td>-</td>
</tr>
<tr>
<td>Thesis</td>
<td>48</td>
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<tr>
<td>Total credits required</td>
<td>48</td>
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### Suggested Study Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>SIM1899 Thesis</td>
<td>12 (0-36-0)</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>SIM1899 Thesis</td>
<td>12 (0-36-0)</td>
</tr>
<tr>
<td>2</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>SIM1899 Thesis</td>
<td>12 (0-36-0)</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>SIM1899 Thesis</td>
<td>12 (0-36-0)</td>
</tr>
</tbody>
</table>
Plan 2: For students who enter program with Master degree

### Requirement for Graduation

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required courses</td>
<td>6</td>
</tr>
<tr>
<td>Elective courses</td>
<td>≥ 6</td>
</tr>
<tr>
<td>Thesis</td>
<td>36</td>
</tr>
<tr>
<td>Total credits required</td>
<td>≥ 48</td>
</tr>
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</table>

### Suggested Study Plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>SIMI699 Thesis 9 (0-27-0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elective courses</td>
</tr>
<tr>
<td>1</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>SIMI699 Thesis 9 (0-27-0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elective courses</td>
</tr>
<tr>
<td>1</td>
<td>Summer</td>
<td>SIMI613* Advanced Medical Virology 3 (3-0-6) or SIMI617* Advanced Medical Bacteriology and Mycology 3 (3-0-6)</td>
</tr>
</tbody>
</table>
# Plan 2: For students who enter program with Master degree

## Suggested study plan

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>SIMI699</td>
<td>Thesis</td>
<td>12 (0-36-0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elective courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>SIMI688</td>
<td>Current Topics in Medical Microbiology</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIMI699</td>
<td>Thesis</td>
<td>9 (0-27-0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elective courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>SIMI613*</td>
<td>Advanced Medical Virology</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIMI617*</td>
<td>Advanced Medical Bacteriology and Mycology</td>
<td>3 (3-0-6)</td>
</tr>
</tbody>
</table>

*Required courses

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**Ph.D. Program in Medical Microbiology (plan 2)**
# COURSE INFORMATION

## Required Courses

<table>
<thead>
<tr>
<th>ID</th>
<th>Courses</th>
<th>Credits</th>
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<tbody>
<tr>
<td>SIMI512</td>
<td>Medical Bacteriology and Mycology</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td>SIMI513</td>
<td>Medical Virology</td>
<td>2 (2-0-4)</td>
</tr>
<tr>
<td>SIMI613*</td>
<td>Advanced Medical Virology</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td>SIMI616</td>
<td>Diagnostic Microbiology</td>
<td>3 (1-6-4)</td>
</tr>
<tr>
<td>SIMI617*</td>
<td>Advanced Medical Bacteriology and Mycology</td>
<td>3 (3-0-6)</td>
</tr>
<tr>
<td>SIMI687</td>
<td>Microbiology Seminar</td>
<td>1 (1-0-2)</td>
</tr>
</tbody>
</table>

**Thesis**

| SIMI698  | Thesis                                       | 16 (0-48-0) |

* Student can choose between SIMI613 and SIMI617 based on thesis area
**COURSE DESCRIPTION**

**Required Courses**

**SIMI512 Medical Bacteriology and Mycology**

Physical and biological properties of pathogenic bacteria and fungi, physiology, classification, identification, syndromes or diseases caused by bacteria or fungi, mechanism of disease and pathogenesis, laboratory diagnosis, specimen collection, isolation, cultivation methods, mechanisms of antimicrobial action and resistance, antimicrobial susceptibility testing, epidemiology, prevention and treatment.

**SIMI513 Medical Virology**

Basic knowledge on properties of human viruses, physiology, molecular biology, genetics, viral replication, classification, virus and host interactions, and pathogenesis, clinical syndromes, viral diseases, laboratory diagnosis, anti-viral drugs, epidemiology, prevention and control.
**COURSE DESCRIPTION**

**Required Courses**

**SIMI613 Advanced Medical Virology**

Advanced knowledge of viruses and subviral agents of medical importance, taxonomic classification, viral replication, viral-host interactions, pathogenesis, antiviral drugs, vaccines, epidemiology, prevention and control, development of novel diagnostic techniques for common and emerging viral diseases, virus vectors for gene therapy, drug development and antiviral substance testings.

**SIMI616 Diagnostic Microbiology**

Principles and practice of laboratory techniques for diagnosis of infectious diseases caused by bacteria, viruses and fungi, clinical specimens of choice, specimen collection and transport, laboratory techniques including microscopic examination, isolation and identification of pathogenic agents, antigen detection, antibody detection, nucleic acid-based detection methods, and interpretation of the laboratory results, anti-microbial susceptibility testing, long term storage of pathogenic agents, topics for laboratory management such as laboratory safety, quality control, quality assurance, laboratory ethics, resource management.
**Course Description**

**SIMI617 Advanced Medical Bacteriology and Mycology**
Details knowledge of metabolisms, genetics, toxins and factors causing diseases; properties of anti-microbial drugs, anti-microbial sensitivity tests using novel laboratory techniques, mechanisms of anti-microbial resistance; bacteria with typical properties extraordinary from others; molecular bacteriology and mycology in medicine; concepts in development of techniques used in the disease diagnosis, as well as in the study on biological properties and bacterial and fungal strain identification for molecular epidemiological studies; novel vaccine development for better efficiency in disease protection.

**SIMI686 Microbiology Seminar**
The analysis, synthesis, presentation and discussion on the current advanced knowledge in microbiology, immunology gathering from various resources and aspects in research ethics.

**SIMI698 Thesis**
Research on medical microbiology based on the analysis of available information to establish hypothesis and research topic for thesis. Design and conduct research at international standard with ethics and legality which lead to the synthesis of novel knowledge, or extend/apply the existing knowledge to generate useful result for the academic society.
## Elective Courses

<table>
<thead>
<tr>
<th>ID</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIID501</td>
<td>Molecular and cellular basis of biomedicine</td>
<td>3 (2-2-5)</td>
</tr>
<tr>
<td>SIIM 501</td>
<td>Immunology</td>
<td>2 (2-0-4)</td>
</tr>
<tr>
<td>SIBC 504</td>
<td>Biochemistry</td>
<td>4 (4-0-8)</td>
</tr>
<tr>
<td>SIMI611</td>
<td>Molecular Techniques in Medical Microbiology</td>
<td>3 (2-3-5)</td>
</tr>
<tr>
<td>SIMI615</td>
<td>Fundamental of Diagnostic Microbiology</td>
<td>1 (1-0-2)</td>
</tr>
</tbody>
</table>
Course description

ELECTIVE COURSES

SIID 501 Molecular and cellular basis of biomedicine

Biomolecules, cell structure and function, genetic materials, regulation of gene expression, structure and mechanism of enzyme, membrane biology, cell communication, cell signaling, energy metabolism, cell proliferation, cell differentiation, cell death, cancer, basic immune response, host-pathogen interaction; basic gene, protein, cellular and immunological methods in biomedical research.

SIBC 504 Biochemistry

Structures and functions of biomolecules (protein, carbohydrate, lipid, nucleic acid), enzyme kinetics and regulation, bioenergetics, metabolism of amino acid and the production of urea, metabolism of carbohydrate and lipid, metabolic integration and regulation, common pathway in metabolism, biochemical messengers, molecular action of hormone, nucleotide metabolism, DNA synthesis and repair, RNA and protein synthesis, protein targeting, secretion, and degradation, regulation of gene expression and chromatin remodeling, the importance to adapt biochemistry knowledge to life and work appropriately according to virtue and ethics.
Course description

Required courses

Theory and practice on molecular biology of bacteria, fungi and viruses including genome structure, replication, gene functions and controls; virulence genes; anti-microbial resistance genes; molecular techniques used for the diagnosis of infectious disease, classification, epidemiological study, and the research on pathogenic microorganisms.

ELECTIVE COURSES

SIIM 501 Immunology

Comprehensive of the immune response. Components, development of the immune system, the specific and non-specific immune responses, the mechanisms, consequences and regulations of humoral and cell-mediated immune responses.

SIIM611 Molecular Techniques in Medical Microbiology

Theory and practice on molecular biology of bacteria, fungi and viruses including genome structure, replication, gene functions and controls; virulence genes; anti-microbial resistance genes; molecular techniques used for the diagnosis of infectious disease, classification, epidemiological study, and the research on pathogenic microorganisms.

SIIM615 Fundamental of Diagnostic Microbiology

Fundamental processes in a clinical microbiology laboratory, basic methods for laboratory diagnosis of microbial pathogens (bacteria, viruses and fungi) that are of medical importance, principles of quality control, laboratory safety and role of laboratory for epidemiological investigation of infectious diseases.
The basic components that a thesis proposal should contain are as the following:

**BACKGROUND & RATIONAL**
- This part should contain a brief statement of research problem and literature review that support statement of the problem.

**HYPOTHESIS & OBJECTIVES**
- Specific aims of research study are described here.
- When possible, hypothesis of research question should be stated.

**EXPERIMENTAL DESIGN**
- This section describes materials and methods of the study.
- If applicable, also discuss expected outcomes here.

**RESEARCH PLAN**
- Estimated timeline for research study and thesis proposal examination should be presented in this part.

Note: Abbreviation and references should also be included in the thesis proposal.
According to guideline from Mahidol University a thesis should contain 3 parts: preliminary section, text section and references.

**PRELIMINARY SECTION**

- **Cover page** (thesis title, author’s name, degree title, study field, graduation year, and copyright statement)
- **Title page** (same content as cover page)
- Entitle page
- Approval page
- Acknowledgement
- Abstract
- List of figures
- List of abbreviation
THESIS COMPONENTS (2)

TEXT SECTION

- **Introduction** (background, significance, research objectives)

- **Main content** (detailed literature review, material and methods research findings, discussion, summary)

- **Summary** (besides the summary of the whole thesis, this part should also discuss limitation of the study as well as future direction)
REFERENCES, APPENDICES AND AUTHOR’S BIBLIOGRAPHY

- **References** (References should be listed using Vancouver’s style)

- **Appendices** (detailed literature review, material and methods research findings, discussion, summary)

- **Summary** (besides the summary of the whole thesis, this part should also discuss limitation of the study as well as future direction)
Graduation requirement

*For Ph.D. candidates only

**At least 2 members of the committee must have Ph.D. degree (or equivalent) or an academic title of no less than associate professor. Proposal examination must take place within 2 semesters after registration for the thesis credit.

***FGS = Faculty of Graduate Studies

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**QUALIFYING EXAMINATION**

- Submit nomination of Qualifying Examination Committee** and examination date to Faculty of FGS*** within 15 working days prior to examination date (use form GR.35 or วทน.35 for Thai students)

- Approval by FGS***

- Qualifying examination

- Report examination result to FGS*** within 15 working days after examination (use form GR.38 or วทน.38 for Thai students)
Graduation requirement

- Thesis advisor must be a regular instructor with Ph.D. degree or with an academic title of associate professor or higher.

**FGS = Faculty of Graduated Studies**

***Committee must comprise of at least 3 members with Ph.D. degree or an academic title of associate professor or higher. Thesis Proposal examination must take place within 2 semesters after registration for thesis credit.

**Submit nomination of Thesis Proposal Examination Committee*** to FGS** within 15 days before examination (use form GR.39 or บทย.39 for Thai students)

Approval by FGS**

**Submit nomination of thesis proposal advisor* to FGS** (use form GR.44 or บทย.44 for Thai students)

Approval by FGS**

Report examination result to FGS** within 15 working days after examination (use form GR.33 or บทย.33 for Thai students)

THESIS STEPS

THESIS PROPOSAL EXAMINATION (1)
**THESIS STEPS**

**THESIS PROPOSAL EXAMINATION (2)**

- **Passed**
  - **Passed with conditions**
    - Revise proposal
    - Resubmit result to FGS* (use form GR.37 or บฑ.37 for Thai students)

- **Passed**
  - Report result to FGS* (use form GR.33 or บฑ.33 for Thai students)
  - Submit thesis title and nomination of Thesis Advisory Committee (use form GR.1 or บฑ.33 for Thai students)

- **Not Passed**
  - Repeat examination
  - Resubmit result to FGS* (use form GR.37 or บฑ.37 for Thai students)

*FGS = Faculty of Graduate Studies*
Submit research project to Siriraj Institutional Review Board (SIRB)* within 90 days after proposal examination

Approval by SIRB

Conduct research**

Thesis defense examination

Report progress to major advisor for evaluation & submit result to FGS*** until thesis is completed (use form GR.42 or บค.42 for Thai students) for Thai students

*SIRB Submission form is available at www.si.mahidol.ac.th/th/division/sirb/Eng/index.html#

** Before conducting research, specific training is required for project involved human beings. If animals are included, student must receive approval from the Research and Development Department, Mahidol University. Student should also contact major advisor on regular basis (at least once a month). Request for change regarding thesis title or advisory committee must be submitted to Faculty of Graduates Studies (use form AS-3-10).

*** FGS = Faculty of Graduate Studies
**THESIS STEPS**

**Thesis defense examination (1)**

**Requirement for defense examination**

- Student must have spent > 90 days for conducting thesis research, starting from the approval date of thesis title and thesis advisory committee.
- Student must pass all courses according to curriculum criteria and have GPA > 3.0
- Student must pass English proficiency test
- Student must be approved by the thesis advisory committee.
- Student must submit thesis to the thesis defense committee at least 15 days prior to examination.
**THESIS STEPS**

**THESIS DEFENSE EXAMINATION (2)**

Submit defense examination date & nomination of thesis Defense Committee* to FGS** (use form GR.2 or บทย.2 for Thai students)

- Passed with conditions
  - Revise thesis within 90 days
  - Resubmit result to FGS** (use form GR.37 or บทย.37 for Thai students)
- Defense examination***
  - Passed
  - Notify termination of the project to SIRB
- Not passed
  - Retake examination
  - Resubmit result to FGS** (use form GR.37 or บทย.37 for Thai students)

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*Committee must comprise of at least 3 members with at least one being external examiner. All members should have Ph.D. degree or an academic title of associated professor or higher.

**FGS = Faculty of Graduate Studies

***Student should have the cover page, entitle page, approval page and the abstract checked by Academic Services Section of the Faculty of Graduate Studies prior to defense examination.
**THESIS STEPS**

**EXAMINATION EVALUATION**

- **Defense examination result**
  - **Passed**
  - Notify completion of thesis project to Siriraj Institutional Review Board (SIRB)
  - Prepare for thesis publication

- **Not Passed:**
  - Retakes examination
  - Resubmit the result to FGS* (use form GR.4 or บัณฑ.4 for Thai students)

- **Passed with conditions:**
  - Revises thesis within 90 days
  - Resubmit the result to FGS* (use form GR.37 or บัณฑ.37 for Thai students)

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*FGS = Faculty of Graduate Studies*
THESIS STEPS

REQUEST FOR GRADUATION

Submit a hard copy and a CD copy of thesis to the Academic Services Section of FGS* for checking the format

Submit the thesis (plus a hard copy and a CD copy, in word and PDF format) to the FGS* within 21 days** (including holidays) after passing the defense exam

Submit published manuscript or letter of acceptance from international peer-reviewed academic journal to FGS*

Submit abstract for publication (use form GR.40 or บร.40 for Thai students) and submit the request for degree to FGS* (use form GR.5 or บร.5 for Thai students)

FGS* authorizes the degree

*FGS = Faculty of Graduate Studies
**Student will be charged for late submission (200 Bath/day). FGS will cancel thesis examination result if the submission delay exceeds 90 days (including holidays), and student must start over the entire process, including registration for thesis credits to request for the degree.
DEPARTMENT OF MICROBIOLOGY

YOUR SUCCESS

Is

OUR MISSION