Thailand International Postgraduate Programme (TIPP)

(For the academic years 2026–2028)

1. **Course Title:** Master of Science in Microbiology (International Program)
2. **Master Degree:** M.Sc. (Microbiology)
3. **Academic Institution:** Faculty of Sciences (FS), Prince of Songkla University (PSU), Hat Yai Campus
4. **Duration:** 2 years (June 2026-May 2028)
5. **Background and Rational:**

The Master of Science in Microbiology Program (MSM) began and enrolled its first batch of students in 1996. Currently, the revision of the 2021 curriculum is based on the Outcome-Based Education (OBE) with a focus on creating high-level personnel with the ability to conduct research and create innovation related to the study of microorganisms to be a driving force for economic development in response to the 20-year national strategy (2018-2037).

Microbiology is a field of science and technology that directly affects economic development both nationally and globally. The program is planned to be in line with the Sustainable Development Goals (SDGs) adopted by the United Nations, which promote a better and more sustainable future for all. In addition, the strategic plan of the national BCG (Bio-Circular-Green) economy model (2021-2026) focuses on 4 sectors (food and agriculture, medical and wellness, bioenergy, biomaterial and biochemical, and tourism and creative economy).

Our MSM program will also emphasize utilizing microbial diversity and cultural diversity as a basis for developing the nation and improving people's quality of life. Thailand has a basic capital and strengths in the diversity of its biological resources, including microorganisms with high potential for utilization. Building research experts in Microbiology is therefore directly related to supporting the development of all sectors. The MSM program aims to produce graduates who are able to apply microbiological knowledge and skills in the development of agricultural sector and country's future industries (existing industries with potential; S-curve and new industries; New S-curve), such as research on the diversity of microbes in ecosystems, microbial applications for growing crops, aquaculture and animal husbandry, bioremediation of pollutants, utilization of agricultural and

industrial wastes, biofuel, as well as research on pathogenic microorganisms. Prevention and treatment of infectious diseases are also needed to the development of the integrated medical industry.

As part of the MSM program, students will have the opportunity to conduct research in both microbial technology and medical microbiology and such as the utilization of microorganisms in biocontrol, wastewater treatment and bioremediation, bioenergy, bioplastic, and applications of microbes and their enzymes in food industry, molecular studies of pathogenic microbes and antibiotic resistance, antimicrobial activity of natural products. The courses we offer include biosafety training, microbiology communication, and innovation management. Moreover, the MSM program applies case-based and problem-based learning from the socioeconomics, industrial, and public health situations in order to enhance the graduates' ability to solve current problems and to provide information for decision supporting as well.

In order to fulfill our objectives, and to ensure the quality of the implementation of the MSM program, the Self-Assessment Report under the ASEAN University Network Quality Assurance has been prepared every year since 2015. The latest self-assessment reports and reflections from the internal assessors (2021), mentioned that the MSM program showed its strengths in five areas: 1) The MSM program has gathered the essential requirements of the various groups of stakeholders, especially in both academic and industrial sectors and conducted the backward curriculum design which reflected in the expected learning outcomes and the required courses. 2) An updated curriculum related to the strategic plan of national BCG Economy and the Sustainable UN-SDGs meet the needs of those who are interested in microbial-related careers. 3) The programs comprise faculty members whose experts are cover in both medical microbiology and applied microbiology and they were well-prepared for a rapid evolution in the modern microbiology era. 4) The program has invested in up-to-date facilities and infrastructure which are sufficient for the faculty and student's needs. 5) Graduates have 100% direct employment and are in high demand, especially researcher position in the government sector.

6.Objectives:

To produce graduates who are able to apply microbiological knowledge and skills in the development of agricultural sector and country's future industries (existing industries with potential; S-curve and new industries; New S-curve), such as research on the diversity of microbes in ecosystems, microbial applications for growing crops, aquaculture and animal husbandry, bioremediation of pollutants, utilization of agricultural and industrial wastes, biofuel, as well as

research on pathogenic microorganisms including prevention and treatment of infectious diseases, and the development of the integrated medical industry.

7. Course Synopsis and Methodology:

7.1. Study plan

Plan A1: Thesis only

Plan A2: Thesis combined with coursework

Educational Management System

System: Semester system: 15 weeks per semester

Credit Assignment: The number of credits assigned to each subject is determined as follows: A Lecture consuming 15 hours per semester is equal to 1 credit hour. Laboratory consuming 30 hours per semester is equal to 1 credit hour. Thesis consuming 45 hours per semester is equal to 1 credit hour.

Program Structure and Requirements: Number of credits: a minimum of 36 credits

Curriculum structure

Course	**Minimum credits**	
	Plan A1	**Plan A2**
Required courses	-	8
Elective courses	-	6
Thesis	36	22
Total	**36**	**36**

Study plans for the MSM program: Plan A1 and Plan A2.

Year	Semester	Plan A 1				Plan A 2			
1	1	326-501*	Biosafety & Biosecurity	1	credit	326-501	Biosafety & Biosecurity	1	credit
		326-691	Thesis	9	credits	326-502	Ethics & Research Methodology in Microbiology	2	credits
						326-503	Modern Microbiology	2	credits
						xxx-xxx	Elective Course	3	credits
			Total	**9**	**credits**		**Total**	**8**	**credits**
	2	326-504*	Creativity and Microbiological Innovation Management	1	credit	326-504	Creativity and Microbiological Innovation Management	1	credit
		326-691	Thesis	9	credits	326-692	Thesis	4	credits
		326-693*	Seminar in Microbiology I	1	credit	326-693	Seminar in Microbiology I	1	credit
						xxx-xxx	Elective Course	3	credits
			Total	**9**	**credits**		**Total**	**9**	**credits**
2	1	326-691	Thesis	9	credits	326-692	Thesis	9	credits
		326-694*	Seminar in Microbiology II	1	credit	326-694	Seminar in Microbiology II	1	credit
			Total	**9**	**credits**		**Total**	**10**	**credits**
	2	326-691	Thesis	9	credits	326-692	Thesis	9	credits
			Total	**9**	**credits**		**Total**	**9**	**credits**
Total credits required		**36**				**36**			

Notes: * Audit.
All students are required to register for 326-500 (audit).

Thesis plan:

1. Appointment for advisor: the 1st semester of the 1st year

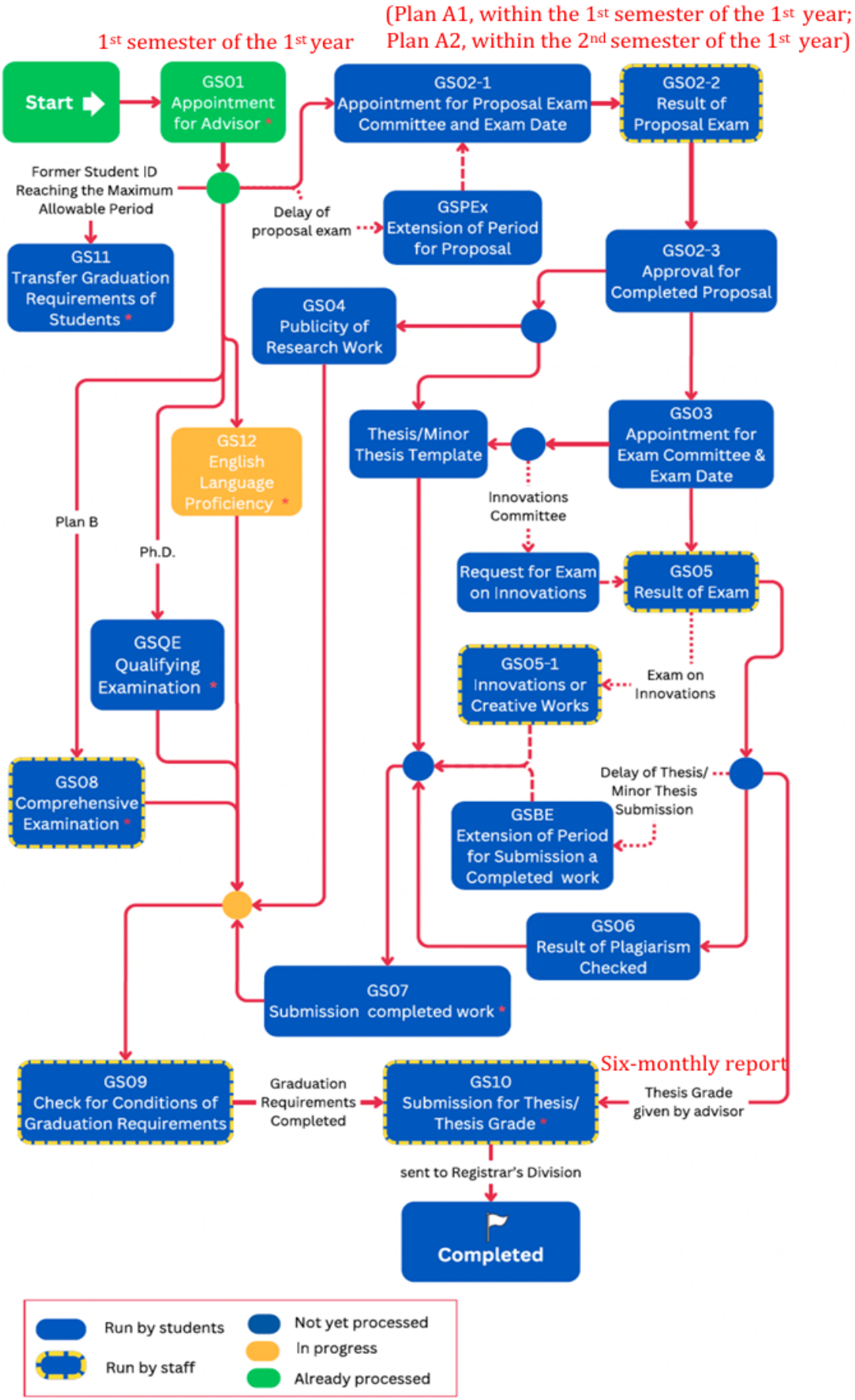
2. Appointment for proposal examination:

- Plan A1: withing the 1st semester of the 1st year

- Plan A2: withing the 2nd semester of the 1st year

3. Submission of the complete thesis work and appointment for thesis defense: the 2nd semester of the 2nd year

Guidelines and Forms: Graduate Study Management System (GSMS): https://gsms.psu.ac.th



7.2. Course Content

1. Required courses:

326-500# Essential Immunology and Molecular Biology (1 credit)

326-501 Biosafety and Biosecurity (1 credit)

326-502 Ethics and Research Methodology in Microbiology (2 credits)

326-503 Modern Microbiology (2 credits)

326-504* Creativity and Microbiological Innovation Management (1 credit)

326-693* Seminar in Microbiology I (1 credit)

326-694* Seminar in Microbiology II (1 credit)

All students are required to register for 326-500# course (audit) as a foundation course. Plan A2 students are required 8 credits for the required courses. Plan A1 students are required for audit registration for 326-501, 326-504, 326-693 and 326-694 courses.

2. Elective courses:

All students have to register 6 credits of the elective courses which must include at least 3 credits of courses offered by the Microbiology Program (begin with 326-xxx) which 326-505 course is required only for the students who graduated with non-Microbiology degree.

Courses offered by the Microbiology Program

326-505* Principles of Microbiology (3 credits)

326-511 Module: Applied Microbiology (6 credits)

326-513 Molecular Microbiology (3 credits)

326-531 Microbiology for Sustainable Agriculture (3 credits)

326-591 Special Topics in Microbiology I (1 credit)

326-592 Special Topics in Microbiology II (1 credit)

326-602 Advanced Microbial Physiology (3 credits)

326-611 Module: Advanced Immunology and Techniques (6 credits)

326-621 Advanced Medical Microbiology (3 credits)

326-622 Mechanisms of Microbial Pathogenesis (3 credits)

326-631 Advanced Applied Microbiology (3 credits)

326-641 Advanced Bacteriology (3 credits)

326-661 Advanced Mycology (3 credits)

326-671 Advanced Parasitology (3 credits)

326-681 Advanced Virology (3 credits)

Courses offered by other Programs in the Faculty of Science

318-503 Bioinformatics for Large Scale Biological Data Analysis (2 credits)

318-505 Experimental Model Organisms (4 credits)

318-522 Molecular Innovation (2 credits)

328-541 Module: Genetic Engineering and Protein Technologies (9 credits)

330-661 Molecular Evolution and Applications (3 credits)

Courses offered by the Graduate Program in the Faculty of Dentistry

660-711 Animal Cell Culture in Medical Research 2((1)-2-3)

Notes: * Only for the students who graduated with a non-Microbiology degree.

1. Besides the above elective courses, students can enroll in other courses offered by graduate programs of Prince of Songkla University with prior approval by the advisor.

3. Thesis

3.1 Plan A1: 326-691 Thesis 36(0-108-0)

3.2 Plan A2: 326-692 Thesis 22(0-66-0)

8. Graduation Conditions:

1. Student must meet the qualifications as outlined in the Ministry of Education Graduate Program Standard Criteria B.E.2558 and the Academic Regulations of Graduate Studies, Prince of Songkla University, B.E. 2563.

2. In order to graduate, a student **must**

Plan A1

• Meet the non-native language proficiency requirements announced by the Graduate School, Prince of Songkla University.

• Pass the final oral thesis examination evaluated by a committee appointed by the University. The final oral defense is open to the public. If Passed with Conditions, the student must revise the thesis paper until the result shows Passed.

• Have the thesis/part of the thesis (1) published or (2) accepted for publication in a journal in accordance with OHEC's Regulations on Criteria for Selection of Academic Journals for Publication of Academic Works (B.E.2556).

Plan A2

• Meet the non-native language proficiency requirements announced by the Graduate School, Prince of Songkla University.

• Complete all the courses according to curricula structures and obtained a cumulative grade

point average of at least 3.00.

• Pass the final oral thesis examination evaluated by a committee appointed by the University. The final oral defense is open to the public. If Passed with Conditions, the student must revise the thesis paper until the result shows Passed.

• Have the thesis/part of the thesis (1) published or (2) accepted for publication in a journal in accordance with OHEC's Regulations on Criteria for Selection of Academic Journals for Publication of Academic Works (B.E.2556) or (3) have presented it at an academic conference and the full paper published in the proceedings.

[According to the Implementation Guidelines for Higher Education Program Standard Criteria B.E. 2558, Item 13, research dissemination in a national conference means presentation of a research in a conference together with publication of the research full paper fulfilling the following criteria: (1) The proceedings are reviewed by an editorial board or at least 25% of the organizing committee comprise professors or doctoral degree holders from other institutions who have expertise in the field of study. (2) The proceedings contain at least 25% of articles written by authors from at least 3 other institutions.]

3. Other requirements should meet specific criteria established by the funding source.

9. Applicant Qualifications

Plan A1: Thesis only

1. Applicants must hold a Bachelor's degree in Microbiology or in related field with a GPA of at least 3.25 **and**

2. Have experience in conducting research or project in the area of Microbiology or in related field **and**

3. Applicants whose native language is not English MUST demonstrate the results of the English language proficiency test. The English test score certificate must not be older than 2 years at the time of application.

4. Other qualifications should conform to the requirements indicated in the Academic Regulations of Graduate Studies, Prince of Songkla University, B.E. 2563.

Plan A2: Thesis combined with coursework

1. Applicants must hold a Bachelor's degree in Microbiology or related fields **and**

2. Applicants whose native language is not English MUST demonstrate the results of the English proficiency test. The English test score certificate must not be older than 2 years at the time

of application.

3. Other qualifications should conform to the requirements indicated in the Academic Regulations of Graduate Studies, Prince of Songkla University, B.E. 2563.

10. Document Required

- Application form and Medical Report (more details: https://tica- thaigov.mfa.go.th/en/page/75500-tipp-application-form?menu=605b13dbb6f1b76ed31778b3)
- Transcript
- Recommendation Letter
- English Test

11. Contact:

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