



Program Structure and Specification
Doctor of Philosophy Program in Biochemistry
(International Program)
Curriculum Last Revised in 2024
for
Students Entering in Academic Year 2024

1. Name of the program: Doctor of Philosophy Program in Biochemistry (International Program)

2. Name of the degree:

Full name : Doctor of Philosophy (Biochemistry)

Abbreviation: Ph.D. (Biochemistry)

3. Responsible units:

3.1 Department of Biochemistry, Faculty of Science, Khon Kaen University – Teaching Institution

3.2 Faculty of Graduate Studies, Khon Kaen University – Awarding Institution

4. Program overview:

4.1 Objective of the Program: To produce Ph.D. graduate knowledgeable in biochemistry and advanced technology related to biochemistry and capable of analysis and solving complex problems in biochemistry with high quality research output at the international level (Q1 & Q2 research papers or innovation(s) with economic and social importance of sustainable development), as well as capable of contributing knowledge in biochemistry on research and career development with good research ethics and morality, and being cooperative leader to

push forward excellency on biochemical knowledge and research for the nation.

4.2 Expected Learning Outcomes of the Program:

Upon completion of the doctoral program, graduates must be able to:

4.2.1 Knowledge: demonstrate an important knowledge in Biochemistry and a detailed knowledge of the topics related to the area of research, stay up to date with the literature of biochemistry, have ability to use frontier knowledge for research to provide new knowledge with peer review approval that would lead to holistic problem solving and/or adapt to any contexts.

4.2.2 Skills: capable of learning and connecting knowledge in biochemistry, demonstrate systematic scientific thinking and critical thinking, capable of developing their own learning in a dynamic way (constructivism) and lifelong learning in biochemistry and related area, demonstrate communication and reasoning under a scientific process, demonstrate effective English communication skills in both verbal and writing in biochemistry, demonstrate collaboration and team working, capable of using digital technology, demonstrate leadership and creativity, capable of complex problem solving, and use the scientific process for research to provide new knowledge in the form of international research publication or innovations with peer review approval.

4.2.3 Ethics: conduct research or experiment in a fair, honest, impartial, and transparent manner, no plagiarism, telling the truth and not exaggerating, having a public mind and protecting the environment.

4.2.4 Character: being observant and detail oriented, being reasonable and confident, demonstrate a trustworthy personality, eager to learn, demonstrate self-reliance and self-determination, patience and self-discipline, social responsibility, technology and information literacy, demonstrate a modern management to utilize or contribute biochemical knowledge globally.

4.3 Career path: Many of our student alumni work as staffs in universities, researchers in research institutes, or as scientists in food, pharmaceutical, cosmetic and chemical industries.

5. Program structure, study plan and program length:

5.1 Types of the program and number of credits required for the program

5.1.1 Program Type 1.1: no less than 52 credits

5.1.2 Program Type 2.1: no less than 52 credits

5.1.3 Program Type 2.2: no less than 72 credits

5.2 Curriculum structure

	Program Type 1.1	Program Type 2.1	Program Type 2.2
Required Courses	3 (Seminar courses, Audit)	16	16
Elective Courses	-	-	8
Dissertation	52	36	48
Total	52	52	72

5.3 Course requirements

5.3.1 Required courses:	Credits (lecture-lab-self study)
SC 857 901 Biochemistry for Ph.D. Study I	3(3-0-6)
SC 857 902 Biochemistry for Ph.D. Study II	3(3-0-6)
SC 857 913 Biochemical Techniques for Ph.D. Study I	1(1-0-2)
SC 857 914 Laboratory in Biochemical Techniques for Ph.D. Study	2(0-6-3)
SC 857 915 Biochemical Techniques for Ph.D. Study II	2(2-0-4)
SC 857 716 Laboratory in Biochemical Techniques for Ph.D. Study II	2(0-6-3)
SC 857 991 Dissertation Seminar in Biochemistry I	1(1-0-2)
SC 857 992 Dissertation Seminar in Biochemistry II	1(1-0-2)
SC 857 993 Dissertation Seminar in Biochemistry III	1(1-0-2)

5.3.2 Elective courses:	Credits (lecture-lab-self study)
SC 857 922 Integrated Biochemistry for Ph.D. Study	3(3-0-6)
SC 857 924 Advanced Genetic Engineering in Prokaryotic Cells for Ph.D. Study	2(2-0-4)
SC 875 931 PCR Technology for Ph.D. Study	2(2-0-4)
SC 857 933 Protein Structure and Function for Ph.D. Study	2(2-0-4)
SC 857 935 Biochemistry and Biology of Cancer for Ph.D. Study	3(3-0-6)
SC 857 937 Analysis and presentation of biological science articles for Ph.D. Study	2(2-0-4)

SC 857 938 Computational Biochemistry of Protein for Ph.D. Study	2(2-0-4)
SC 857 994 Research Project in Biochemistry for Ph.D. Study	2(0-6-12)

Note: - Besides the above elective courses, students can enroll in other courses offered by graduate programs of Khon Kaen University with approval from the program director, major advisor, or program administrative committee.

- Research Project in Biochemistry: Staffs at the Department of Biochemistry have received research grants from Thailand Research Fund (TRF), TRF-Golden Jubilee, National Research Council of Thailand (NRCT).

5.3.3 Dissertation:	Credits
SC 857 996 Dissertation	52 Credits (Program Type 1.1)
SC 857 998 Dissertation	36 Credits (Program Type 2.1)
SC 857 999 Dissertation	48 Credits (Program Type 2.2)

5.4 Course code explanation:

Two first letters represent the abbreviated name of the Faculty

SC = Faculty of Science

Two first numbers after letters represent department within the faculty or program of study

85 = Biochemistry

The third number represents level of study

7 = Graduate study

The fourth number represents level of study

9 = Ph.D. study

Three last two letters represent the subject order issued by the program

5.5 Study plan and program length:

Year	Courses	Credits		
		Program Type 1.1	Program Type 2.1	Program Type 2.2
1	Semester 1			
	SC 857 901 Biochemistry for Ph.D. Study I	-	3(3-0-6)	3(3-0-6)
	SC 857 913 Biochemical Techniques for Ph.D. Study I	-	1(1-0-2)	1(1-0-2)
	SC 857 914 Laboratory in Biochemical Techniques for Ph.D. Study I	-	2(0-6-3)	2(0-6-3)

	SC 857 991 Dissertation Seminar in Biochemistry I	1(1-0-2) (Audit)	-	-
	SC 857 996 Dissertation	9	-	-
	xxxxx xxx Elective course	-	-	6
	Cumulative credits	9	6	12
1	Semester 2	Program Type 1.1	Program Type 2.1	Program Type 2.2
	SC 857 902 Biochemistry for Ph.D. Study II	-	3(3-0-6)	3(3-0-6)
	SC 857 915 Biochemical Techniques for Ph.D. Study II	-	2(2-0-4)	2(2-0-4)
	SC 857 916 Laboratory in Biochemical Techniques for Ph.D. Study II	-	2(0-6-3)	2(0-6-3)
	SC 857 991 Dissertation Seminar in Biochemistry I	-	1(1-0-2)	1(1-0-2)
	SC 857 992 Dissertation Seminar in Biochemistry II	1(1-0-2) (Audit)	-	-
	SC 857 996 Dissertation	9	-	-
	SC 857 998 Dissertation	-	3	-
	xxxxx xxx Elective course	-	-	2
	Cumulative credits	18	15	22
2	Semester 1	Program Type 1.1	Program Type 2.1	Program Type 2.2
	SC 857 992 Dissertation Seminar in Biochemistry II	-	1(1-0-2)	1(1-0-2)
	SC 857 993 Dissertation Seminar in Biochemistry III	1(1-0-2) (Audit)	-	-
	SC 857 996 Dissertation	9	-	-
	SC 857 998 Dissertation	-	9	-
	SC 857 999 Dissertation	-	-	9
	Cumulative credits	27	25	32
2	Semester 2	Program Type 1.1	Program Type 2.1	Program Type 2.2
	SC 857 993 Dissertation Seminar in Biochemistry III	-	1(1-0-2)	1(1-0-2)
	SC 857 996 Dissertation	9	-	-
	SC 857 998 Dissertation	-	9	-
	SC 857 999 Dissertation	-	-	9

	Cumulative credits	36	35	42
3	Semester 1	Program Type 1.1	Program Type 2.1	Program Type 2.2
	SC 857 996 Dissertation	9	-	-
	SC 857 998 Dissertation	-	9	-
	SC 857 999 Dissertation	-	-	9
	Cumulative credits	45	44	51
3	Semester 2	Program Type 1.1	Program Type 2.1	Program Type 2.2
	SC 857 996 Dissertation	7	-	-
	SC 857 998 Dissertation	-	6	-
	SC 857 999 Dissertation	-	-	9
	Cumulative credits	52	52	60
4	Semester 1			Program Type 2.2
	SC 857 999 Dissertation			9
	Cumulative credits			69
4	Semester 2			Program Type 2.2
	SC 857 999 Dissertation			3
	Cumulative credits			72

Minimum and maximum program length:

- Holding Bachelor's degree (program type 2.2): minimum 4 years, maximum 8 years
- Holding Master's degree (program types 1.1 and 2.1): minimum 3 years, maximum 6 years

6. Admission Requirements:

- 6.1 Program Type 1.1 (No coursework): Applicants must be studying in the final year at the M.Sc. level, or hold a degree in M.Sc. (Biochemistry, Chemistry, Biology, Molecular Biology or related area) with GPA of at least 3.50 or equivalent.
- 6.2 Program Type 2.1 (Coursework): Applicants must be studying in the final year at the M.Sc. level, or hold a degree in M.Sc. (Biochemistry, Chemistry, Biology, Molecular Biology or related area).
- 6.3 Program Type 2.2 (Coursework): Applicants must be studying in the final year at the B.Sc. level, or hold a degree in B.Sc. (Biochemistry, Chemistry, Biology, Molecular Biology or related area).

related area) with GPA of at least 3.50 or equivalent.

- 6.4 International applicants must have a TOEFL score of at least 400 (32 for internet-based score) or an IELTS of at least 4.0. Application must be submitted online via Graduate School, Khon Kaen University web site (<https://interadmission.gs.kku.ac.th/app/#/auth>).
- 6.5 The entrance examinations are arranged by 1) Graduate School consisting of the English Proficiency Test and 2) Entering committee of the Program consisting of Interviewing in English language covering general knowledge in biochemistry, biology and chemistry. International applicants with qualified English proficiency score as mentioned above will be directed only to the interview process.
- 6.6 Applicants may receive exception to any of the requirements above, if the permission is granted by the Administrative Program Committee in concurrence with Graduate School.

7. Selection Method:

Selection method: Applicants are selected based on academic/research credentials and interview according to rules and regulation of the Graduate School, Khon Kaen University. International applicants may be subjected to phone/online interview and must provide proof of financial support during the study period to be considered for admission. Final judgment will be made under the consideration of the Entering Committee and the Administrative Program Committee in concurrence with the Dean of Graduate School, Khon Kaen University.

8. Academic system, Fees and Research group:

8.1 Semester system: Two semesters per year

8.2 Credit Assignment: The number of credits assigned to each subject is determined as follows:

- 8.2.1 Lecture or discussion consuming 15 hours per semester is equal to 1 credit hour. 8.2.2 Laboratory or practice consuming 30 hours per semester is equal to 1 credit hour. 8.2.3 Thesis consuming 45 hours per semester is equal to 1 credit hour.

8.3 Fees:

- Application fee per subject area 40 USD
- Tuition fee/semester 30,000 Baht
- Oversea Student Fee 15,000 Baht
- Maintaining Student's Status 2,500 Baht for each semester
- Examination Fee: - Qualifying Proficiency Examination 1,500 Baht
 - Thesis Defense 3,000 Baht

8.3 Research group: Major research interests/groups in the Department are:

- 8.3.1 Biosensor & Nanotechnology
- 8.3.2 Cancer Biology

8.3.3 Food and Nutritional Biochemistry

8.3.4 Plant Biochemistry

8.3.5 Protein and Enzymology

9. Scholarship:

The department offers 1-2 partial scholarships for highly qualified students each year. This scholarship covers tuition fees of two semesters. Additionally, 3-5 research assistant scholarships from research groups in the Department are also available each year.

10. Language:

English is used in teaching and learning as well as in the assessment processes.

11. Registration:

11.1 Students must register as fulltime students.

11.2 Students must register for no less than 9 credits and no more than 15 credits per regular semester, or according to program study plan.

12. Evaluation and Graduation Requirements:

12.1 Evaluation: Student evaluation is in accordance with the rules and regulations of Khon Kaen University.

12.2 Graduation Requirements:

12.2.1 Program Type 1.1: Students in this program type must register for 3 seminar courses (no credit count) and 52 credits of dissertation. Total credits acquired must be no less than 52 credits.

12.2.2 Program Type 2.1: Students in this program type must register for 16 credits of required courses and 36 credits of dissertation. Total credits acquired must be no less than 52 credits.

12.2.3 Program Type 2.2: Students in this program type must register for 16 credits of required courses, no less than 8 credits of elective courses and 48 credits of dissertation. Total credits acquired must be no less than 72 credits.

12.2.4 must pass the English Proficiency Examination offered by the Khon Kaen University Language Institute or have a TOEFL score of at least 543 (72 for internet-based score) or an IELTS of at least 5.5 or TU-GET of at least 550 or CU-TEP of at least 70.

12.2.5 Students in all program types must pass a qualifying examination.

12.2.6 Students in all program types must present dissertation and pass the oral dissertation examination according to the regulations of Graduate School, Khon Kaen University.

12.2.7 Students in Program Type 1.1 must present dissertation at least once in

national/international conference and obtain at least one publication or a manuscript that has been accepted for publication in an international peer-reviewed journal and at least 2 publications or manuscripts that have been accepted for publication in national/international peer-reviewed journal (indexed in SCOPUS or Web of Science) or at least 1 publication or manuscript that has been accepted for publication in national/international peer-reviewed journal (indexed in SCOPUS or Web of Science) and 1 innovation with economic and social importance of sustainable development or 1 patent.

12.2.8 Students in Program Types 2.1 and 2.2 must obtain accumulative GPA of at least 3.00, present dissertation at least once in national/international conference, and obtain at least 1 publication or manuscript that has been accepted for publication in national/international peer-reviewed journal (indexed in SCOPUS or Web of Science) or 1 innovation with economic and social importance of sustainable development or 1 patent.

13. Library:

Our KKU Library possesses more than 1,000 books. Many e-books and e-journals can be accessed online. Besides, a lot of textbooks and journals (in both electronic and printed formats) are available at other libraries within Khon Kaen University.

14. Qualifying Examination:

Qualifying exam contains both multiple-choice and essay-type questions, the content of which is covered by SC 857 901 and SC 857 902 courses. Exam questions are divided into four sections as following: Part 1 – Chemistry of Biomolecules, Part 2 – Enzymes and Kinetics, Part 3 – Bioenergetics and Metabolism and Part 4 – DNA synthesis and Gene expression. A score of 50% or more of each part is required to pass the qualifying examination.

If student fails the qualifying examination at the first attempt, a reexamination will be scheduled. The student must pass the examination with approval from Qualifying Examination Committee to become a “Ph.D. candidate”.

15. Dissertation Research Proposal Presentation:

After passing the qualifying examination, students must submit a document to Graduate School for appointment of Dissertation Research Proposal Committee consisting of at least 3 faculty members, one of which is student’s major advisor while other two can be any academic staff within or outside Khon Kaen University.

16. Dissertation Defense:

Upon completion of doctoral research and dissertation writing and approval from Dissertation

Advisory Committee, students must submit a document to Graduate School for appointment of Dissertation Defense Committee consisting of at least 5 members: a committee chair, an external examiner and the dissertation advisory committee. After passing the oral dissertation defense, students can submit final written dissertation to Graduate School, Khon Kaen University.

17. Contact:

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