Doctor of Philosophy Program in Crop Science (International Program)

<u>Curriculum Structure</u>

Plan 1 – Research Emphasis (Thesis Only)

Applicants holding a Master's degree: Thesis credits: not less than 60 credits

Plan 2 – Research + Coursework: This plan emphasizes high–quality research that contributes to academic advancement, together with coursework.

Plan 2.1 – Applicants holding a Master's degree

Total credits: not less than 60 credits

Compulsory courses: not less than 4 credits

Elective courses: not less than 11 credits

Thesis: not less than 45 credits

Plan 2.2 – Applicants holding a Bachelor's degree

Total credits: not less than 92 credits

Compulsory courses: not less than 6 credits

Elective courses: not less than 26 credits

Thesis: not less than 60 credits

1) Compulsory Courses

		Credits (Lecture – Laboratory – Self–study)
IAT32 6801	M.Sc. Seminar 1	1(1–0–2)
IAT32 6802	M.Sc. Seminar 2	1(1–0–2)
IAT32 7801	Ph.D. Seminar 1	1(1–0–2)
IAT32 7802	Ph.D. Seminar 2	1(1–0–2)
IAT32 7803	Ph.D. Seminar 3	1(1–0–2)
IAT32 7804	Ph.D. Seminar 4	1(1–0–2)

2) Electives

2.1) Core Courses and Foundation Courses in Crop Science

IAT32 5601	Experimental Designs and Analysis	3(2–3–4)
IAT32 5602	Research Methods in Crop Science	2(1–3–2)
IAT32 5603	Advanced Crop Science	3(3–0–6)

IAT32 5604	Manuscript Preparation	2(1–3–2)
IAT32 5605	Fundamental Crop Sciences I	3(3–0–6)
IAT32 5606	Fundamental Crop Sciences II	3(3–0–6)
IAT32 5607	Fundamental Crop Sciences Laboratory	2(1–3–6)
IAT32 5608	Crop Technology for All	3(2–3–4)
IAT325609	Modern Technology in Crop Production	2(2–0–4)
IAT32 5610	Crop Production Instruments	2(1–3–4)

2.2) Plant breeding

IAT32 5101	Modern Plant Breeding Techniques	3(2–3–4)
IAT32 6101	Advanced Plant Breeding I	3(3–0–6)
IAT32 6102	Genetic Engineering for Crop Improvement	3(3–0–6)
IAT32 6103	Molecular Plant Breeding	3(3–0–6)
IAT32 6104	Breeding for Plant Pest Resistance	2(2–0–4)
IAT32 6105	Plant Breeding for Abiotic Stress Tolerance	2(2–0–4)
IAT32 6106	Individual Study in Plant Breeding	1(1–0–2)
IAT32 5102	Selected Topics in Plant Breeding I	2(2–0–4)
IAT32 6107	Selected Topics in Plant Breeding II	3(3–0–6)
IAT32 6108	Quantitative Genetics for Plant Breeding	3(3–0–6)

2.3) Plant Physiology

IAT32 6201	Advanced Crop Physiology I	3(2–3–4)
IAT32 6202	Plant Responses and Adaptation to Stress	3(2–3–4)
IAT32 6203	Physiology of Plant Growth and Development	3(3–0–6)
IAT32 6204	Advanced Plant Growth Regulators	3(3–0–6)
IAT32 6205	Molecular Plant Development	2(2–0–4)
IAT32 6206	Applied Methods in Crop Physiology	2(0–6–0)
IAT32 6207	Plant Metabolism	3(3–0–6)
IAT32 6208	Individual Study in Plant Physiology	1(1–0–2)
IAT32 6209	Omics Technology for Modern Crop Production	3(3–0–6)
IAT32 6210	Light and Carbon Dioxide Application in Crop Production	3(2–3–4)
IAT32 6211	Plant–beneficial Microbe Interaction	3(3–0–6)

2.4) Entomology and Plant Pathology

IAT32 5301	Insect Structure and Function	3(3–0–6)
IAT32 5302	Insect Ecology	3(2–3–4)
IAT32 5303	Entomological Technique Practicum	3(2–3–4)
IAT32 6301	Insecticide Toxicology	3(3–0–6)
IAT32 6302	Postharvest Plant Pests Management	3(2–3–4)
IAT32 6303	Advanced Biological Control of Plant Pests	3(2–3–4)
IAT32 6304	Plant Resistance to Plant Pests	3(3–0–6)
IAT32 6305	Insect Transmission of Plant Diseases	3(3–0–6)
IAT32 6306	Individual Study in Entomology	1(1–0–2)
IAT32 6307	Product Development of Bio–Pesticides	3(2–3–4)
IAT32 5304	Plant Pathogens	3(2–3–4)
IAT32 5305	Plant Pathological Techniques	3(2–3–4)
IAT32 5306	Plant Health and Plant Disease Diagnosis	3(2–3–4)
IAT32 6308	Seed Pathology	3(2–3–4)
IAT32 6309	Integrated Plant Health Management	3(2–3–4)
IAT32 6310	International Standard for Safe Crop Production	3(2–3–4)
IAT32 6311	Individual Study in Modern Plant Pathology	1(1–0–2)
IAT32 6312	Digital Technology in Plant Pathology	3(2–3–4)
IAT32 6313	Ag–tech Startup in Plant Pathology	3(2–3–4)
IAT32 7301	Postharvest Insect Pest Management	3(2–3–4)
IAT32 7302	Advanced Biological Control of Insect Pests	3(2–3–4)
IAT32 7303	Plant Resistance to Insects	3(3–0–6)
IAT32 7304	Postharvest Pathology	3(2–3–4)
IAT32 7305	Plant Resistance to Diseases	3(3–0–6)
IAT32 7306	Advanced Biological Control of Plant Diseases	3(2–3–4)

2.5 Soil Science

IAT32 5401	Mineral Plant Nutrients	3(2–3–4)
IAT32 5402	Soil and Plant Analysis	3(2–3–4)
IAT32 5403	Fertilizer Technology	3(3–0–6)
IAT32 6401	Soil Microbiology	3(2–3–4)
IAT32 6402	Soil Chemistry	3(3–0–6)
IAT32 6403	Soil Physics	3(3–0–6)
IAT32 6404	Soil and Plant Relationships	3(3–0–6)
IAT32 6405	Individual Study in Soil Science	1(1–0–2)

2.6) Postharvest Technology and Seed Technology

IAT32 5501	Postharvest Technology of Horticultural Crops	3(2–3–4)
IAT32 5502	Postharvest Technology of Flowers	3(2–3–4)
IAT32 5503	Postharvest Technology of Field Crops	3(3–0–6)
IAT32 5504	Postharvest Handling Systems of Fresh Produce	3(3–0–6)
IAT32 6501	Postharvest Technology Instrumentation	1(0–3–0)
IAT32 6502	Postharvest Physiology and Changes of Fresh Produce	3(3–0–6)
IAT32 6503	Individual Study in Postharvest Technology	1(1–0–2)
IAT32 6504	Packaging for Agricultural Products	3(3–0–6)
IAT32 6505	Minimally Processed Fruits and Vegetables	3(2–1–3)
IAT32 5505	High Quality Seed Production	3(3–0–6)
IAT32 6506	Seed Physiology	3(3–0–6)
IAT32 6507	Advanced Seed Business	3(3–0–6)
IAT32 6508	Individual Study in Modern Seed Technology	1(1–0–2)

2.7) Crop Science Relating Subjects

IAT32 6601	Sustainability Trends in the Crop Innovation	3(2–3–4)
IAT32 6602	Crop Simulation Modeling	3(2–3–4)
IAT32 6603	Advanced Statistics for Experimental Research	3(3–0–6)

IAT32 6604	Perspectives in Crop Science Strategies	1(1-0-2)
IAT32 6605	Research Topic in Crop Science	1(1-0-2)
IAT32 6606	Plant Factory for Management of Culture Solution	3(2-3-4)
IAT32 6607	Urban Indoor Cultivation of High Value Crops	3(2-3-4)
IAT32 6608	Design Thinking for Crop Technology and Innovation	3(2-3-4)
IAT32 6609	Application of SAS Package for Statistical Analysis in Plant Science Research	2(1-3-4)
IAT32 6610	Advance Statistical Analysis in Plant Science Research by SAS Package	2(1-3-2)

2.8) Innovative and Entrepreneur in Crop Production

IAT32 5701	Entrepreneurship and Innovation	2(2-0-4)
IAT32 5702	Opportunity and Feasibility Analysis	2(2-0-4)
IAT32 5703	Intellectual Property Strategies	2(2-0-4)
IAT32 6701	Agripreneur in Crop Science	3(0-9-0)
IAT32 6702	Sustainable Cropping Systems for Thailand	3(3-0-6)
IAT32 6703	Agricultural Extension and Technology Adoption	3(3-0-6)
IAT32 6704	Value Chain Development for High-Value Crops	3(3-0-6)
IAT32 6705	Smart Farming Systems Design	3(3-0-6)
IAT32 6706	Crop Product Innovation	3(3-0-6)
IAT32 6707	Innovative and Sustainable Crop Industry and Business	3(3-0-6)
IAT32 6708	Climate Change Adaption in Crop Production	3(3-0-6)
IAT32 6709	Crop-tech Startup Accelerator	3(3-0-6)
IAT32 6710	Crop-tech Startup-Venture Capital and Scaling Growth	3(3-0-6)
IAT32 6711	Crop-tech Business Models for Sustainable Change	3(3-0-6)
IAT32 6712	Cross-Cultural Agriculture	3(0-9-0)
IAT32 6713	Practicing Transdisciplinary Collaboration	3(0-9-9)

2.9) Special problem and Co-operative Education

IAT32 6803	Graduate Special Problems	3(0-9-9)

IAT32 6804   Graduate Co–operative Education   8(0–0–0)

3) Thesis

IAT32 7902   Ph. D. Thesis Scheme 2.1 $\geq$ 45 Credits

IAT32 7903   Ph. D. Thesis Scheme 2.2 $\geq$ 60 Credits

Study Plan for Ph.D. Scheme 1.1

Year of Enrollment	Trimester 1	Trimester 2	Trimester 3
1	IAT32 7901 Ph. D. Thesis Scheme 1.1	IAT32 7901 Ph. D. Thesis Scheme 1.1	IAT32 7901 Ph. D. Thesis Scheme 1.1
2	IAT32 7901 Ph. D. Thesis Scheme 1.1	IAT32 7901 Ph. D. Thesis Scheme 1.1	IAT32 7901 Ph. D. Thesis Scheme 1.1
3	IAT32 7901 Ph. D. Thesis Scheme 1.1	IAT32 7901 Ph. D. Thesis Scheme 1.1	IAT32 7901 Ph. D. Thesis Scheme 1.1

Study Plan for Ph.D. Scheme 2.1

Year of Enrollment	Trimester 1	credits	Trimester 2	credits	Trimester 3	credits
1	IAT32 XXXX Electives	6	IAT32 XXXX Electives	2	IAT32 XXXX Electives	3
			IAT32 7801 Ph.D.Seminar I	1	IAT32 7902 Ph. D. Thesis Scheme 2.1	3
			IAT32 7902 Ph. D. Thesis Scheme 2.1	3		
	Total	6	Total	7	Total	6
2	IAT32 7802 Ph.D.Seminar II	1	IAT32 7902 Ph. D. Thesis Scheme 2.1	6	IAT32 7803 Ph.D.Seminar III	1
	IAT32 7902 Ph. D. Thesis Scheme 2.1	6			IAT32 7902 Ph. D. Thesis Scheme 2.1	6
	Total	7	Total	10	Total	7
3	IAT32 7902 Ph. D. Thesis Scheme 2.1	7	IAT32 7902 Ph. D. Thesis Scheme 2.1	7	IAT32 7804 Ph.D.Seminar IV	1
					IAT32 7902 Ph. D. Thesis Scheme 2.1	7
	Total	7	Total	7	Total	8

Study Plan for Ph.D. Scheme 2.2

Year of Enrollment	Trimester 1	credits	Trimester 2	credits	Trimester 3	credits
1	IAT32 XXXX Electives	6	IAT32 6801 M.Sc. Seminar I IAT32 XXXX Electives	1 6	IAT32 XXXX Electives	6
	Total	**6**	**Total**	**7**	**Total**	**6**
2	IAT32 XXXX Electives IAT32 7903 Ph. D. Thesis Scheme 2.2	6 3	IAT32 7903 Ph. D. Thesis Scheme 2.2	4	IAT32 6802 M.Sc. Seminar II IAT32 7903 Ph. D. Thesis Scheme 2.2	1 4
	Total	**9**	**Total**	**4**	**Total**	**5**
3	IAT32 7801 Ph.D.Seminar I IAT32 7903 Ph. D. Thesis Scheme 2.2	1 5	IAT32 7903 Ph. D. Thesis Scheme 2.2	5	IAT32 7802 Ph.D.Seminar II IAT32 7903 Ph. D. Thesis Scheme 2.2	1 6
	Total	**6**	**Total**	**5**	**Total**	**7**
4	IAT32 7903 Ph. D. Thesis Scheme 2.2	6	IAT32 7803 Ph.D.Seminar III IAT32 7903 Ph. D. Thesis Scheme 2.2	1 6	IAT32 7903 Ph. D. Thesis Scheme 2.2	6
	Total	**6**	**Total**	**10**	**Total**	**6**
5	IAT32 7903 Ph. D. Thesis Scheme 2.2	5	IAT32 7903 Ph. D. Thesis Scheme 2.2	5	IAT32 7804 Ph.D.Seminar IV IAT32 7903 Ph. D. Thesis Scheme 2.2	1 5
	Total	**5**	**Total**	**5**	**Total**	**6**