

Department of Industrial Engineering

Industrial Engineering (International Program)

Program Doctor of Philosophy Program in Industrial Engineering (International Program)

Degree Doctor of Philosophy (Industrial Engineering), Ph.D. (Industrial Engineering)

Option 2.1:

Total credits required: minimum 48 credits

(1) Major courses: minimum 12 credits

- **Seminar: 4 credits**

01206697 Seminar 1,1,1,1

- **Major requirements: 3 credits**

01206691 Advanced Research Methodology in Industrial Engineering 3(3-0-6)

- **Major electives: minimum 5 credits**

Students are required to choose at least 5 credits of graduate electives from the list below. It is also possible to choose 500 level electives related to their studies from other faculties. He/she must gain approval from the advisory committee, Head of Department, and the Dean of the Graduate School.

01206611 Industrial Mathematics Foundation for Advanced Studies 3(3-0-6)

01206621 Advanced Optimization 3(3-0-6)

01206631 Advanced Engineering Stochastic Processes 3(3-0-6)

01206641 Advanced Statistical Methods in Quality Engineering 3(3-0-6)

01206651 Advanced Production Planning and Control 3(3-0-6)

01206652 Advanced Logistics Management 3(3-0-6)

01206661 Advanced Artificial Intelligence in Industrial Engineering 3(3-0-6)

01206696 Selected Topics in Industrial Engineering 3(3-0-6)

01206698 Special Problems 1-3

(2) Thesis: minimum 36 credits

01206699 Thesis 1-36

Course Description

01206611 Industrial Mathematics Foundation for Advanced Studies

3(3-0-6)

Reading and doing mathematical proofs, model building, properties classification, definitions creation, unification and generalization of mathematical methods and

	theories, applications of mathematical thinking process in linear algebra and industry.	
01206621	Advanced Optimization Numerical techniques for large scale discrete and continuous optimizations, decomposition and partitioning principles, dynamic and stochastic optimization, infinite dimensional optimization, applied optimization in engineering designs.	3(3-0-6)
01206631	Advanced Engineering Stochastic Processes Stochastic processes with large scale states and stages, analysis of large engineering processes by approximations and simulations, applications in analysis and designs of large queueing network and large scale engineering system reliability.	3(3-0-6)
01206641	Advanced Statistical Methods in Quality Engineering Applications of advanced statistical methods, time series analysis and processing, optimization based experimentation, multi-variate analysis with major emphasis in modeling and designs of optimal operations under engineering quality constraints.	3(3-0-6)
01206651	Advanced Production Planning and Control Developments of models, techniques for planning and control of a production system with multi-items under resource, capacity constraints and uncertain demands, comparative studies among methods and philosophy of production management published in technical journals.	3(3-0-6)
01206652	Advanced Logistics Management Advanced Location Theory, Transportation Management, Warehouse Management.	3(3-0-6)
01206661	Advanced Artificial Intelligence in Industrial Engineering Application of artificial intelligence techniques to solve industrial engineering problems. Neural networks, fuzzy logic and genetic algorithm.	3(3-0-6)
01206691	Advanced Research Methodology in Industrial Engineering Advanced research in Industrial Engineering and preparation of research proposal, application of information technology and computer data processing and retrieval, data analysis, article writing and presentation, group discussion. Paper preparation for presentation and publication.	3(3-0-6)
01206696	Selected Topics in Industrial Engineering Selected topics in Industrial Engineering at the doctoral level. Topics are subject to change each semester.	3(3-0-6)
01206697	Seminar Presentation and discussion on current interesting topics in Industrial Engineering at the doctoral degree level.	1
01206698	Special Problems Study and research in industrial engineering at the doctoral degree level and compile into a written report.	1-3
01206699	Thesis	1-36

Research at the doctoral degree level and compile into a thesis.