DOCTOR OF PHILOSOPHY IN INFORMATION TECHNOLOGY

Credit hour requirements: a minimum of 72 credit hours. Some credit may be applied from previous graduate studies as noted. 40 credit hours if entering with a Master of Science in Information Technology or a related computing field; 49 credit hours if entering with a master of science not in information technology or a related computing field; 72 credit hours if entering with a bachelor's degree in information technology.

The doctoral program is designed for those students who have an interest in pursuing an academic or industrial research career. To be awarded a Ph.D. in Information Technology, a student must demonstrate mastery in several areas of information technology and must make a significant original contribution to research in the field of information technology. On entry into the program, a student is required to take coursework in a number of areas and pass written and oral qualifying exams. Next, the student must formulate a thesis research problem and present it and the proposed research to a committee of faculty at a comprehensive exam. Upon passing this examination, the student must carry out the research and write and defend a thesis, among other requirements.

Admission to the Ph.D. program is competitive and applicants must have high grade point averages, GRE scores, and (if required) TOEFL scores. Students who enter the program after completing a master's degree (not necessarily in information technology) normally require three to four years of full-time work to complete the Ph.D. Part-time students require more time. Students may also enter the program directly after completing only a bachelor's degree in information technology. The direct program enables bright, highly-motivated students to participate in departmental research programs immediately after their bachelor's degree. Students in the direct program take extra coursework and normally require an additional year to complete the Ph.D. compared to students in the post-master's program.

Overview

To receive a Ph.D., students must meet coursework requirements and pass qualifying exams, a comprehensive exam, and a thesis defense. At the conclusion of their studies, graduates of this degree should be able to:

- Demonstrate mastery of one or more core areas of information technology though original research and published documentation of such research.
- Research, design, and deliver optimal technical and policy technology solutions for the problems of business, industry, government, non-profit organizations, and individuals in the student's particular core area(s).
- Lead, manage, and work with teams in an enterprise environment to collaboratively arrive at optimal technology solutions.

Curriculum

Students in the Ph.D. program have course requirements that depend on whether they enter the program with a Master of Science in Information Technology or a related computing field, a master's degree not in information technology or a computing field, or with a bachelor's degree in information technology. A student's adviser may require specific core or elective courses be taken. Possible elective courses may include PSYC 540, PSYC 545, PSYC 546, PSYC 554, and MATH 525.

Students With a Master of Science in Information Technology or a Related Computing Field [1]

Requirement	Credits
Minimum Total Credits Required	72
Maximum Transfer Credit [2]	32
500-, 600-, or 700-Level Course Credit Required	40

Code	Title	Credit Hours
Required Courses		**(12)**
Select a minimum of three courses from three different core course groups as listed below.		9
ITM 695	Doctoral Seminar [3]	3
Readings and Special Problems Courses		**(0-12)**
ITMS 597	Special Problems in Information Technology [4]	0-12
General Electives		**(0-6)**
Select zero to six credit hours		0-6
Ph.D. Research		**(24-28)**
ITM 691	Research and Thesis Ph.D.	24-28
Transfer Credit		**(32)**
A maximum of 32 credit hours of masters transfer credit is allowed.		32

Students With a Master's degree Not in Information Technology or a Computing Field [1]

Requirement	Credits
Minimum Total Credits Required	72
Maximum Transfer Credit [2]	23
500-, 600-, or 700-Level Course Credit Required	49

Code	Title	Credit Hours
Required Courses		**(18)**
Select a minimum of one course from each of the following groups: Software Development, System Technologies, and Business Development		9
Select a minimum of two courses from two of the following groups: Cybersecurity, Data Analytics and Management, Management		6
ITM 695	Doctoral Seminar [3]	3
Readings and Special Problems Courses		**(0-9)**
ITMT 597	Reading and Special Problems [4]	0-9
General Electives		**(0-9)**
Select zero to nine credit hours in conjunction with adviser		0-9
Ph.D. Research		**(24-31)**
ITM 691	Research and Thesis Ph.D. [4]	24-31
Transfer Credit		**(23)**
A maximum of 23 hours of masters transfer credit is allowed.		23

Students With a Bachelor's degree in Information Technology

Requirement	Credits
Minimum Credits Required	72
500-, 600-, or 700-Level Course Credit Required	72

Code	Title	Credit Hours
Required Courses		**(18)**
Select a minimum of one course from each of the following groups: Software Development, System Technologies, and Business Development		9
Select a minimum of two courses from two of the following groups: Cybersecurity, Data Analytics and Management, Management		6
ITM 695	Doctoral Seminar [3]	3
Readings and Special Problems Courses		**(0-12)**
ITMT 597	Reading and Special Problems	0-12
General Electives		**(9-21)**
Select 9-21 credit hours in conjunction with adviser		9-21
Ph.D. Research		**(24-36)**
ITM 691	Research and Thesis Ph.D.	24-36

1 Students with a degree in a related computing field or a master's degree not in information technology or a related computing field may be required to complete prerequisite and specific core or elective courses selected by their adviser. Undergraduate-level prerequisite courses will not be applied to the degree.

2 400-level Information Technology and Management courses earned at Illinois Institute of Technology may not be applied. A maximum of 12 credit hours of 400-level courses may be transferred if the courses were applied to a master's degree.

3 Students must take three sequential semesters of ITM 695.

4 At least three credit hours of ITMT 597 or ITMT 691 are required in the first year.

Notes

- To be used to satisfy requirements, courses must be passed with a grade of "B" or better. 400-level Information Technology and Management courses earned at Illinois Institute of Technology and accelerated courses cannot be used. With department approval, courses may be replaced by more advanced courses.
- The 500- and 600-level electives can include credit hours from ITMT 595. They cannot include credit hours from ITMT 597, ITM 691, or ITM 695. With department approval, up to nine credit hours may come from outside the ITM department.
- Total credits required for the degree is a minimum. A student's adviser may require other courses to be taken. Consequently the total credits taken may exceed the minimum.

Core Courses

There are six core course areas. To meet a core requirement, a course must be taken at Illinois Institute of Technology as part of the Ph.D. or a previously completed Master's program; transfer courses from other institutions cannot be used. Core courses must be passed with "B" or better to satisfy core course requirements..

Code	Title	Credit Hours
Group 1: Software Development		**(18)**
ITMD 511	Application Dev Methodologies	3
ITMD 512	Structured/Systems Programming	3
ITMD 513	Open Source App Development	3
ITMD 515	Advanced Software Programming	3
ITMD 536	Software Testing and Maintenance	3
ITMD 542	Full-Stack Development	3
Group 2: System Technologies		**(18)**
ITMO 541	Network Admin & Operations	3
ITMO 544	Cloud Computing Technologies	3
ITMO 553	Open Source System Admin	3
ITMO 554	Operating Sys Virtualization	3
ITMO 557	Storage Technologies	3
ITMT 593	Embedded Systems	3
Group 3: Business Development		**(18)**
ITMD 532	UML-Based Software Development	3
ITMD 534	Human/Computer Interaction	3
ITMD 535	Human-Computer Interaction Design	3
ITMM 581	IT Entrepreneurship	3
ITMM 582	Business Innovation	3
ITMM 587	Product Management	3
Group 4: Cybersecurity		**(18)**
ITMS 528	Database Security	3
ITMS 548	Cyber Security Technologies	3
ITMS 558	Operating Systems Security	3
ITMS 578	Cyber Security Management	3
ITMS 584	Governance, Risk & Compliance	3
ITMS 588	Incdnt Rspnse Disaster Rcvry	3
Group 5: Data Analytics and Management		**(3)**
ITMD 522	Data Mining and Machine Learning	3
ITMD 523	Adv Topics in Data Management	3
ITMD 524	Applied Artificial Intelligence and Deep Learning	3
ITMD 526	Data Warehousing	3
ITMD 529	Advanced Data Analytics	3
ITMT 531	OO Syst Anlys Mod & Des	3
Group 6: Management		**(18)**
ITMM 537	Vendor Mgmt/Service Lvl Agrmts	3
ITMM 570	Fund of Mgmt for Tech Prof	3
ITMM 571	Project Management for ITM	3
ITMM 572	Process Eng for IT Managers	3
ITMM 574	ITM Frameworks	3
ITMM 585	Legal and Ethical Issues in IT	3

Ph.D. Qualifying Examination

The Ph.D. qualifying examination has two parts: three written examinations and an oral examination. The written exam is used to judge a student's breadth of knowledge; the oral exam is used to judge a student's research potential. Students must complete the comprehensive examination before they exceed 48 hours of coursework completed in the degree. See the Information Technology and Management website (itm.iit.edu/phd) and the Examinations section of this bulletin for details..

Master of Science Exit from Program

Students wishing to leave the direct Ph.D. program with the degree of Master of Science in Information Technology and Management must satisfy all the requirements of the master's degree and either write an M.S. thesis or pass the Ph.D. qualifying examination. In special circumstances students may petition the department for consideration.

Comprehensive (Research Proposal) Examination

The purpose of the comprehensive examination is to ensure that the candidate has the background to carry out successful research in the chosen area and that the research problem is properly formulated and has sufficient scholarly merit. The student (in concert with the student's research adviser) must develop a written research proposal containing a literature review, a proposed research topic, and a program of research based upon this topic, and then present it orally before a Ph.D. comprehensive examination committee as well. The Ph.D. comprehensive examination committee must consist of at least two members who are tenured or tenure-track faculty members in the department and a third committee member who is a tenured or tenure-track faculty member from outside the department. This examination must be completed before the student exceeds 54 hours of coursework. See the Information Technology and Management website (itm.iit.edu/phd) and the Examinations section of this bulletin for details.

Thesis Defense

Each student must present an oral defense of their Ph.D. thesis. The thesis review committee is appointed in the same way as the Ph.D. comprehensive examination committee and may consist of the same members. It will examine the written thesis and examine the student during the oral defense. All Ph.D. thesis defenses are open to the public. See the Information Technology and Management website (itm.iit.edu/phd) and the Examinations section of this bulletin for details.