

TECHNOLOGY MANAGEMENT PROGRAM

Academic Director: Mihir Parikh

Modern technologies are redefining products, services, processes, organizational forms, business models and industry structures. Understanding the managerial implications of these technologies has become a fast-growing and highly important arena for business research. High-quality scholars, capable researchers and expert professionals are needed to expand the knowledge base in technology management through significant intellectual and educational contributions. Additionally, these developments have created a huge international demand for new kinds of managers who can strategically integrate technology and management to innovate and achieve a sustainable competitive advantage for a company. To prepare these managers, qualified educators with the ability to teach technology management are increasingly in demand.

The Doctor of Philosophy in Technology Management (PhD-TM) Program focuses on the increasingly important technology management field and develops scholars, researchers and other academics who aim to contribute to knowledge-generation and education relevant for the technology-centered business environment. The program is under the auspices of the Department of Management.

Faculty in the Department of Management possesses significant research strengths in a diverse range of technology management-related fields. The faculty's major professional commitment is to research, thereby contributing to the theory and practice of technology management in important and fundamental ways.

Located in the high-technology heart of New York City, the PhD-TM Program provides immediate access to the world-leading business community and industries (such as financial services, entertainment and media, health care and pharmaceuticals, publishing, advertising and fashion). This broad industrial base serves as a platform for conducting research, obtaining research support and discovering diverse opportunities for scholarly and educational collaboration.

The department's Institute for Technology and Enterprise (ITE) is a New York City research and educational hub for bridging management and innovation. ITE is a focal point where practitioners, researchers and professionals can interact and learn from one another. ITE offers a portfolio of round tables, seminars, leadership forums and other research-based activities. PhD-TM students are expected to participate and take lead roles in ITE's research undertakings.

The Department of Management offers a full range of academic programs and knowledge-generation activities all related to technology management in some essential fashion. These programs include the executive master's programs Management of Technology (MOT) and Telecommunications and Information Management (TIM); evening master's programs in management, financial engineering and organizational behavior; and the bachelor's program Technology and Information Management (T&IM). Together, these programs create a broad value chain of educational efforts in which courses and students with a strong interest in technology management provide PhD-TM students with a host of opportunities for intellectual and educational experiences.

This terminal degree program is designed for research-oriented students who are largely interested in research-based positions at academic and research institutions. Universities with undergraduate and graduate programs that emphasize the integration of technology and management will be a primary source of career opportunities for PhD-TM graduates. In addition, government agencies, not-for-profit research organizations, corporate research centers and research-based consulting firms will also seek PhD-TM graduates.

For more information, please visit www.phd-tm.poly.edu.

SAMPLE THEMES

The following are examples of the themes that a PhD-TM student can select:

- Innovation Strategy and Management
- Sector-Specific Patterns of Innovations
- Disruptive Technologies and Innovations
- Information Technology-enabled Innovations
- High-Tech Marketing and Innovation Diffusion
- Strategic Alliances for Innovation
- Technology Life Cycle
- Technology Strategy
- Supply Chain Management and Integration
- Knowledge Management
- Management of Information Systems and Technologies
- Strategic Uses of Information Technologies
- Information Economics and Strategy
- Leadership in High-Tech Firms
- Cross-Cultural Leadership
- Leadership Measurement
- Management of Knowledge Workers
- Managing the Human Aspects of Technological Change
- Impacts of Technology upon Individuals, Organizations and Society
- Technical Competencies
- Real Options in Decision Making
- Design Patterns for Information-less Trading
- Global Technology Management

ADMISSION INFORMATION

Admission to the PhD-TM Program is based on an in-depth evaluation of an applicant's academic record, professional experience, research potential, interest in the doctoral study and overall intellectual and professional qualifications. Students must submit the following to be considered for admission:

- Application form with required application fee.
- Official transcripts of all previous undergraduate and graduate records indicating a bachelor's degree with at least a B average from an accredited college or university. The transcripts must be sent directly to the Office of Graduate Admissions.
- Official score from either the Graduate Management Aptitude Test (GMAT) or Graduate Record Examination (GRE).
- Official score from the Test of English as a Foreign Language (TOEFL) if the applicant earned a bachelor's degree from an institution in a non-English-speaking country or if English is the second language. A minimum score of 600 for the paper test (250 for the computer test) is required for admission.
- Three letters of recommendations from persons qualified to comment on the applicant's aptitude for doctoral study and research. Preferably two should be from academics.
- A statement of purpose that at least covers why applicants wants to pursue the PhD-TM at Polytechnic University and how well they are prepared for this study.

In some cases, applicants are contacted for a telephone or face-to-face interview.

In rare cases, the PhD-TM Admissions Committee may admit an applicant who does not meet all required admissions criteria as a non-degree student. Such a student will then have a subsequent opportunity to apply for admission to the PhD-TM Program.

DEGREE REQUIREMENTS AND CURRICULUM

The curriculum for the PhD-TM Program is designed to foster a research-intensive doctoral education relevant for the rapidly emerging area of technology management. Management core courses provide a necessary foundation in management. Technology management courses provide the exposure to the fundamental and most current research and thinking in the broadly defined technology management field. Research methods courses help students develop quantitative and qualitative research skills and management research methods. Thematic elective courses help students gain in-depth knowledge in a focused thematic area related to technology management. Working together, students and doctoral advisers select which of these courses are appropriate for the student's course of study in the PhD-TM Program. As part of each thematic elective course, students also take an associated thematic independent research course in order to thoroughly investigate previous research works in the selected theme. All PhD students are required to undertake a doctoral research project, preferably in the second summer semester of the study. This course will introduce students to research requirements of management research. Finally, students work on the dissertation, an original investigation of a research question(s) related to technology management. Students are required to complete 90 graduate units, including 66 units from the coursework and 24 units from the dissertation.

1. Management Core Courses

Management core courses should be taken as early in the program as possible.

MG 601	Organizational Behavior
MG 607	Marketing
MG 608	Managerial Economics and the Economic Environment
MG 609	Managerial Accounting and Finance
MG 630	Operations Management
MG 650	Management of Information Systems and Technologies

2. Technology Management Courses

MG 631	Theory and Design of Organizations
MG 651	Inter-organizational Information Systems
MG 660	Management of New and Emerging Technologies
MG 865	Managing Technological Change and Innovation

Associated Doctoral Seminars

Each 1½ unit doctoral seminar course must be taken with an associated technology management course. These seminars provide strong research background required for doctoral studies in technology management area.

MG 920	Seminar in Managing Knowledge-Workers in Innovative Organizations (Co-requisite MG 631)
MG 921	Seminar in Information Systems Management (Co-requisite MG 651)
MG 922	Seminar in Business Process Innovation (Co-requisite MG 660)
MG 923	Seminar in Managing Technological Change and Innovation (Co-requisite MG 865)

3. Research Methods Courses

MG 933	Business Research Methods
MG 930	Quantitative Analysis I
MG 931	Quantitative Analysis II
MG 932	Qualitative Analysis

4. Thematic Courses

Four thematic elective courses to be selected jointly by students and their adviser.

Associated Thematic Independent Research Courses

Students must take a 1-unit thematic doctoral independent research course that is associated with each thematic elective course. These courses will be organized/offered by students' doctoral adviser.

MG 991	Independent Thematic Doctoral Research Review I
MG 992	Independent Thematic Doctoral Research Review II
MG 993	Independent Thematic Doctoral Research Review III
MG 994	Independent Thematic Doctoral Research Review IV

5. Doctoral Research Project

MG 990	Doctoral Research Project
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6. Comprehensive Examinations

Each student must successfully pass two comprehensive examinations before starting the dissertation.

Part One: This examination includes material covered in the master's level management core and technology management courses. It can be taken after 30 graduate units are accumulated.

Part Two: This examination includes material from the thematic elective and associated thematic research courses, doctoral seminars and research methods courses. It can be taken after the completion of the required coursework.

Students can take both examinations together. Results are provided within one month of the examination. Students have only two chances to pass each examination.

7. Doctoral Dissertation

The dissertation will be evaluated in two parts: Proposal Defense and Final Defense. For details, contact the PhD-TM Program academic director.

MG 999 Doctoral Dissertation Research

8. Prerequisites

All PhD-TM students should have a fundamental knowledge of probability and statistics. Students without such a background are required to take MG 505 Probability and Managerial Statistics. Students without any background in professional writing and communications are required to take JW 600 Introduction to Technical and Professional Communications or JW 631 Proposal Writing. All students are required to take MG 599 Management Pedagogy (1½ units). Units obtained for these prerequisite courses will not count toward the degree.

Students who already have a master's degree or who are transferring from other institutions (or other departments within Polytechnic) are admitted based on the same qualification standards as for new students. For each required MS- or PhD-level course, if students have taken a similar course, they are eligible to transfer units for the course. However, students still have to take and pass both qualifying exams. A minimum of 30 units, including all dissertation units, must be taken at Polytechnic University. No dissertation unit from other institutions can be transferred.

All students must take the required coursework as assigned and follow the curriculum as stipulated. The coursework must be finished within the first three years and the dissertation thesis within the next three years. Thus, all students (full-time and part-time) must complete all the work for the doctorate within six years of initiation.

COURSE DESCRIPTIONS

The following courses are unique to this doctoral program. For course descriptions of other required courses, please refer to the Master of Science in Management Program section of this catalog.

MG 599 Management Pedagogy 1¼:0:0:1½

This course deals with issues related to teaching in management and business administration areas. Various teaching methods including lectures, discussions, case studies, team-based project learning, action learning, tutorials and integrating technology into the learning process are examined. The course is designed to provide preliminary teaching skills and strategies to doctoral candidates.

MG 651 Inter-organizational Information Systems 2½:0:0:3

This course serves as an advanced course on information technology and systems in the organizations with a special focus on inter-organizational systems. In today's network economy, firms are increasingly dependent on alliance partners in addition to customers and suppliers. For continuous information exchange and to bring efficiencies and effectiveness to business processes, companies are building inter-organizational systems. This course reviews all aspects related to these types of information systems. *Co-prerequisite: MG 650.*

MG 920 Seminar in Managing Knowledge Workers in Innovative Organizations 1¼:0:0:1½

Knowledge workers, who are primarily in professional and technical occupations, have come to represent the most important segment of the labor force in the United States. The success of innovative organizations today is largely a result of the knowledge and skills applied by their professional and technical employees. The effective management of such a work force has become one of the most critical problems faced by innovative organizations in both the private and public sectors. This seminar closely examines theory and research as well as various management techniques that can improve the utilization and development of knowledge workers in innovative organizations. *Prerequisite: doctoral standing or instructor's permission. Co-requisite: MG 631.*

MG 921 Seminar in Information Systems Management 1¼:0:0:1½

This course provides PhD-TM students and other related fields with a perspective on modern information systems methodologies, technologies and practices. State-of-the-art research on frameworks for analysis, design and implementation of various types of information systems is presented. Economic and strategic issues related to information technology are presented, with emphasis on research in organizational, inter-organizational and strategic settings. The course follows a seminar format; paper-based and Web-based assigned readings are assigned, and student contribution during class sessions (both as participant and, for one class, as moderator.) is expected. *Prerequisite: doctoral standing or instructor's permission. Co-requisite: MG 651.*

MG 922 Seminar in Business Process Innovation 1¼:0:0:1½

This Doctoral seminar explores dimensions and issues pertaining to the technology-business process interface that are critical to superior performance in today's modern networked corporations. We discuss how technology has impacted everything from common business tasks to complex and global supply chain integration. Qualitative and quantitative aspects in these areas will be addressed. Articles pertaining to leading-edge research and management thought will be discussed in class. The underlying objective is to expose the student to the rich and emergent literature in modern supply chain management, technology integration, and business model evolution. Major themes addressed by this seminar include technology integration, product and process innovation, marketing, logistics, operations, IT and channel management issues in supply chains across various industries. There will be a strong emphasis on understanding the role of technology in the supply chain, and its relation to business processes and innovation. The course follows a seminar format, with dynamically assigned readings and strong student contribution during class sessions (both as participant and, for one class, as moderator.). *Prerequisite: Doctoral Standing or Instructor's Permission. Co-requisite: MG 660.*

MG 923 Seminar in Managing the Innovative Enterprise 1½:0:0:1½

This course explores the enduring, evolving and new elements of managing the innovative enterprise. Course takes an in-depth look at such issues as what it means to “compete on Internet time,” the role of the professional manager and the entrepreneur, attracting human talent and managing in an increasingly global environment. A major purpose of the course is for students to examine their own notions of management, and to begin to assemble the elements that they believe should be incorporated into the ideal enterprise of the future. The course follows a seminar format, with relevant assigned readings and URLs. Student contribution during class sessions (both as participant and, for one class, as moderator.) is expected. *Prerequisite: doctoral standing or instructor’s permission. Co-requisite: MG 865.*

MG 930 Quantitative Analysis I 2½:0:0:3

An introductory PhD-level course in quantitative analysis. Topics include specification, estimation and inference in the context of models that start with the standard linear regression framework. After reviewing the classical linear model, the asymptotic distribution theory necessary for analysis of generalized linear and non-linear models is developed. The course then analyzes estimation methods such as instrumental variables, maximum likelihood, generalized method of moments (GMM) and others. Inference techniques used in the linear regression framework (such as t and F tests) is extended to Wald, Lagrange multiplier, likelihood ratio and other tests. Finally, the linear regression framework is extended to models for panel data, multiple equation models and models for discrete choice. *Prerequisite: doctoral standing or instructor’s permission.*

MG 931 Quantitative Analysis II 2½:0:0:3

This doctoral-level course covers advance quantitative analysis techniques, including multivariate analysis, time-series analysis non parametric methods in statistics and structural equations used in management research. *Prerequisite: doctoral standing or instructor’s permission.*

MG 932 Qualitative Analysis 2½:0:0:3

This course introduces students to the various underlying assumptions and historical roots of qualitative data collection, description, analysis and interpretation. It examines different ways of collecting, analyzing and interpreting qualitative data. It also explores generic issues in conducting and presenting qualitative research such as demonstrating validity and reliability, and provides students hands-on experience with different qualitative methods. *Prerequisite: doctoral standing or instructor’s permission.*

MG 933 Business Research Methods 2½:0:0:3

This course serves as an introduction to theory and techniques of research methods in business. The course includes an introduction to philosophy of science and to the principles of investigation in the social sciences. Students learn to design a study, sample and choose a research design. Also discussed are basic data preparation, measurement and analysis procedures, focusing on univariate and multivariate statistics. *Prerequisite: doctoral standing or instructor’s permission.*

MG 990 Doctoral Research Project 3 units

Original investigation of a limitedly scoped topic chosen by students based on suggestions by their doctoral adviser. This course should be taken preferably in the second summer semester of the study. Conferences and progress reports are required during work, and a final written report is required at completion. The final report should be submitted for presentation/publication at a high-level conference or journal. *Prerequisite: doctoral standing.*

MG 991-994 Independent Doctoral Research Review I-IV 1 unit

Directed individual study or supervised readings in advanced areas of the thematic electives advised by the doctoral adviser. *Prerequisite: doctoral standing. Co-requisite: Associated Thematic Elective when offered.*

MG 999 Doctoral Dissertation Research 3 units

Original investigation of an important research question(s) related to technology management. Research must demonstrate creativity, originality and substantive research worthy of publication in a recognized journal. Students must successfully defend dissertation proposal and final thesis orally. Registration of total 24 units required; continuous dissertation registration is required. *Prerequisites: doctoral standing and passing both comprehensive examinations or academic director’s approval.*