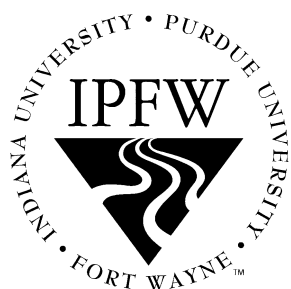


Masters of Science in Technology

2007-09

2/1/08



Indiana University – Purdue University
Fort Wayne
College of Engineering, Technology and
Computer Science
2101 E. Coliseum Blvd.

<http://www.etc.ipfw.edu/mstech/>

GRADUATE PROGRAM HANDBOOK

Masters of Science in Technology
Graduate Handbook
Last revision Sept 10, 2008

Table of Contents

Admission to the Program	Page 2
Application Deadlines	
Financial Aid	
Faculty Advisor	
Degree Requirements	Page 4
Core Component	
Technology Specialization Component	
Technical Elective Component	
Directed Project	
Additional Information on Directed Project.....	Page 8
The Directed Project-Definition	
Directed Project Characteristics	
Purposes of a Directed Project	
Effective Directed Project Practices	
Directed Project Report Format	
Directed Project Procedures.....	Page 10
Directed Project XXX598 Enrollment	
Grades for XXX598 Directed Project Research	
Preparing Directed Project Proposal	
Directed Project Proposal Contents	
Post Project Activities.....	Page 15
Appointment of the Examining Committee & Scheduling the Final Oral Examination	
Completing the XXX598 Requirement	
Course Offering Cycles	Page 17
Two-year	
Three-year	
Five-year	
University Policies	Page 20
Individual Rights and Responsibilities as Students	
Incompletes	
Academic Grade Appeals	
Affirmative Action, Nondiscrimination, and Nonharassment	
Nonharassment	
Research Involving Human Subjects	

Masters of Science in Technology Program Expectations..... Page 23
Expectations of Graduate Students
Expectations of Graduate Teaching Assistants
Criteria for Selection of Graduate Teaching Assistants
Expectations of Graduate Research Assistants

Appendix A: Purdue Graduate Faculty and Their Areas of Expertise..... Page 24

Graduate Student Handbook

Master of Science in Technology

College of Engineering Technology and Computer Science Indiana University Purdue University Fort Wayne

The Master of Science in Technology prepares qualified students and working professionals to assume leadership positions facing the challenges of global technical competition. Creative projects are developed specifically to apply to individual career needs. As a graduate you will have advanced knowledge and skills that are required to function effectively in a modern, international, technical environment and to accept increasing responsibility in industrial and business positions. Core courses are designed to help you develop the skills to do research, evaluation, and analysis. The Technology Specialization Component allows for one of three choices:

Industrial Technology/Manufacturing

Develop advanced leadership skills needed by technical managers, supervisors, and related positions in world-class industries. Widen your career potential with project management skills for organizing resources, implementing systems, increasing productivity, reducing waste and improving product quality.

Information Technology/Advanced Computer Applications

Provide the education experiences and technical leaderships in the areas of enterprise IT architecture, IT security, mobile computing and networking, and strategic technology management. Learn and apply the principles of system methodologies including analysis, design, creation, and management to contemporary problems that involve advanced computer applications and IT systems.

In addition, Elective courses will enable you to increase your technical knowledge within your chosen area of modern technology as well as your knowledge in a related area such as leadership or communication.

The purpose of this handbook is to provide graduate students with an outline of the program requirements that must be fulfilled in order to earn the Master of Science in Technology degree, as well as your rights and responsibilities as graduate students in this program. This handbook should be considered a supplement to the degree requirements outlined in the *IPFW Graduate Bulletin*; therefore, this handbook does not replace any of the requirements outlined in the *Graduate Bulletin*. It is the responsibility of the student to be familiar with all general and specific degree requirements outlined in this handbook and in the *Graduate Bulletin*.

Admission to the Program

Applicants may have technical or non-technical backgrounds with a four-year undergraduate degree required from a recognized institution. Candidates are sought with creative abilities, leadership, interpersonal skills, and personal motivation indicating strong potential to advance in a technology related career. For regular admission, a cumulative GPA of 3.0 or better is required; however, the Graduate Committee evaluates candidates for admission based upon a number of characteristics essential for success in the program including the candidate's intellectual capacity and individual factors such as motivation, leadership, communication and interpersonal skills.

Special Requirements: Applicants for the Information Technology/Advanced Computer Applications technical specialization should have a minimum of 15-18 undergraduate credits of computing and networking course work or equivalent experience or credentials.

Additional supporting documents required for admission include: letters of recommendation and a personal statement of purpose.

Students may be granted conditional admission with additional course or minimum GPA requirements.

International Applicants are accepted in accordance with Purdue University Requirements:

Undergraduate Cumulative Grade Point Average:
3.0 or equivalent required

TOEFL for Non-Native English Speakers:
Minimum Score Required: 550 or equivalent on computer-based test

TWE for Non-Native English Speakers:
Required

Application Deadlines: Applications and all supporting documentation must be received on or before the deadlines listed below:

	Fall	Spring	Summer
U.S. Citizen	July 15	December 1	May 1
International	May 15	October 15	March 15

Purdue University Graduate applications are submitted on-line at:
<http://www.gradschool.purdue.edu/admissions/>

Additional information may be obtained by contacting:

Graduate Admissions Office
Purdue University, Fort Wayne Campus
2101 East Coliseum Boulevard
Fort Wayne, IN 46805-1499
USA

Financial Aid

To be considered a full-time student and qualify for financial aid, graduate students must be enrolled for at least 9 credits per semester (or its equivalent if employed as a teaching or research assistant). Sources of financial aid for graduate students include, but are not limited to, Subsidized Federal Stafford Loans, Unsubsidized Federal Stafford Loans, Perkins Loans, and Federal Work-Study. You may qualify for appointment as a teaching or research assistant. For these positions, preference will be given to full time students. Such appointments carry a stipend as well as partial remission of fees.

Faculty Advisor

Once admitted to the program, students will initially be assigned to work with the Graduate Program Director until the student chooses a faculty advisor. Graduate students are responsible for, and required to, secure a faculty advisor. Any graduate faculty member who has an interest in working with a particular graduate student can act as a faculty advisor for that student. The students should contact a faculty member and request the faculty to become their advisor. It is the prerogative of the faculty to either take the student as their mentee, or turn the student down. Each student is assigned a Faculty Advisor during the time of admission. However, the same faculty does not necessarily have to be the MS Project Advisor (see Directed Project on page 10 for more information). Students are strongly encouraged to identify their project advisor as soon as possible in order to formulate a better course planning which can prepare them for their MS Project.

The faculty advisor serves in part as an advisor to the student for the purposes of course selection and career planning. The Advisor should meet with the student at least twice a year to:

- Review the Graduate Handbook.
- Review expectations of the program.
- Discuss course selections and a program of electives to meet student's career needs.
- Review progress within the program and towards graduation.
- Discuss professional opportunities: paper presentations, professional organizations, and opportunities on campus and within the local community.
- Discuss Capstone project options.

In addition, the advisor will help the student to successfully navigate the requirements of the capstone project. The advisor will:

- Commit time and expertise in guiding the student through the graduate program.
- Work with the student to correct deficiencies in skills and content by suggesting specific courses and activities for remediation as needed.
- Guide the student in his/her applied work during the capstone project experience.

- Serve as the principal advisor for the student in completion of the capstone project.
- Ensure that the student has completed all required coursework.
- Explore possibilities for publication of the student’s work, either individually or jointly.
- Assist the student in the employment search process upon completion of the degree.

If students wish to change advisors during their time in the program, they must first notify the Graduate Program Director of their intention to change advisors.

Degree Requirements

The Master of Science in Technology is a 33-credit program of approved graduate courses composed of the technology core component, the technology specialization component and the technical/leadership elective component. Remedial courses and other undergraduate courses do not apply and do not count towards graduation.

In addition to fulfilling both the academic regulations that apply to all Purdue University graduate students, all degree requirements outlined in the *Graduate Bulletin*, and all program requirements previously outlined in this handbook, graduate students in the Master of Science in Technology program must satisfy all of the following general degree requirements:

- Students must complete all graduate coursework with a grade of B or better in order for the course to count toward the degree.
- Students must maintain a minimum grade point average of 3.0 in all graduate coursework.

The Core Component

The technology core component (9 credits) is designed to provide the graduate students with a general level of graduate training in the intellectual tools of technology. Included are the fundamental elements of scientific thinking to study the real world technological problems, research methodologies in technical environments, and measurement strategies within the context of research design. The core component courses are listed below.

Credit	Course
3	IT 507 Measurement and Evaluation in Industry and Technology
3	IT 508 Quality and Productivity in Industry and Technology
3	TECH 646 Analysis of Research in Industry and Technology

The Technology Specialization Component

The technology specialization component (12 credits) is designed to give the students an ability to develop a curriculum to meet their specific career needs. The student and his/her advisor will select

appropriate electives in their chosen area of technology specialization. Areas of technology specialization and courses are listed below:

Information Technology/Advanced Computer Applications

Credit	Course
3	CPET 545 Service Oriented Architecture & Enterprise Applications
3	CPET 565 Mobile Computing Systems
3	CPET 575 Management of Technology
3	CPET 581 Workshops in Electrical and Computer Engineering Technology
3	CPET 590 Special Topics in Computer Engineering Technology

Industrial Technology/Manufacturing

Credit	Course
3	TECH 540 Reliability and Maintenance
3	TECH 557 Tolerancing Techniques
3	TECH 569 Simulation Modeling
3	TECH 561 Industrial Projects Management and Control
3	TECH 574 Advanced Quality Engineering Methods
3	IT 590 Special Topics in Industrial Technology

Technical/Leadership Elective Component

The technical/leadership elective component (9 credits) is designed to give students an ability to enhance their chosen technology specialization with courses to meet their specific career needs. The student and his/her advisor will select appropriate graduate level electives. These electives must be approved by the advisor prior to enrolling.

The Master of Science in Technology program will maintain flexibility to provide the students with training appropriate to their particular professional needs. Some of the courses that can be used to fulfill the requirements of the technical/leadership elective component are listed below. Check the printed schedule listing or OASIS for courses offered in a particular term. Check with the Graduate Secretary to find out what graduate courses will be offered in future terms.

SE 510	Systems Engineering
ACS 566	The Strategic Role of Information Systems
ACS 567	Software Project Management
BUFW F542	Financial Analysis and Decision Making
BUFW M540	Data Analysis and Management Science
OLS 587	Developing a Leadership Philosophy
STAT 511	Statistical Methods
STAT 522	Applied Regression Analysis
IT 581	Workshops in Industrial Technology
CPET 581	Workshops in Computer Engineering Technology

CPET 590 Special Problems in Computer Engineering Technology
IT 590 Special Problems in Industrial Technology

Or, any graduate level course approved by your advisor. Students are also encouraged to visit MS Tech website to find the details of the currently available courses as some of the abovementioned courses are still in the approval phase.

The Directed Project

The Directed Project (3 credits) provides a technology specialization supervised experience through which you will apply the knowledge and skills acquired from the Master of Science in Technology program. Prior to the directed project, working with your advisor you will form a project review committee, develop a project proposal, and have that proposal approved by your advisory committee. After completing the project, you will write a report concerning the project experience that will be shared with any outside agency or organization and presented to representatives of the agency and Engineering Technology and Computer Science faculty at an appropriate forum. After you have successfully completed all the requirements of the project, your advisory committee will recommend to the Graduate Program Director that you be awarded the Master of Science in Technology degree. (*See “additional information on directed project” for definition, characteristics, purpose, and format of MS Direct Project*).

Directed Project Eligibility:

The Directed Project is to be completed in the final two semesters of graduate study. Prior to beginning the Directed Project, a Directed Project Enrollment Form should be on file with the Graduate Secretary and approved the semester before enrollment in the Directed Project course.

Your advisor (also described as major professor) will determine if your demonstrated knowledge and skills are sufficient to carry out the Directed Project. The advisor will either recommend further work to fill in gaps and, when appropriate, approve you to move on to the Directed Project.

Directed Project Advisory Committee:

Directed Project Advisory Committee, chosen by the student and the advisor, will be comprised of at least three members who are faculty at IPFW. The advisor will be one of the members of the committee and will serve as its chair. The Committee will have at least one additional member from the College of Engineering Technology and Computer Science. Only one member of the committee may be an IPFW faculty member from outside the College of Engineering Technology and Computer Science. (*See “Post Project Activities” for other details regarding appointment of examination committee and final oral presentation*).

Directed Project Proposal:

Upon approval by the Directed Project Advisory Committee, you will develop a Project Proposal. The proposal is intended to outline the expectations and anticipated outcomes of the project experience. The proposal must be approved by the Master of Science in Technology Program Committee before a student can register for their Directed Project course. (*See “Directed Project Procedures” for other details regarding course enrollment and preparation of directed project proposal*).

Final Report of the Directed Project:

Upon completion of Directed Project, you will prepare and submit to your Advisory/Examination committee a detailed report of project experience, methods, and results. Typically this report is 60-100 pages in length. The final draft of the project report will be submitted to Directed Project Advisory/Examination Committee for review and approval. In addition, an error-free copy of the final report must be placed in the department office two weeks prior to the oral presentation of the report, so that all members of the department and the university community who wish to review it may do so. (See “Additional Information on Directed Project” for other details regarding format of final project report).

No less than six weeks after the Directed Project Advisory/Examination Committee has approved the project report, the student will give an oral presentation of the report to the members of the student’s committee and a public audience that may include relevant professionals, faculty members of the College of Engineering Technology and Computer Science, other IPFW faculty, staff, and students of the university. The chair and committee members have priority in asking questions of the student presenting. The grade for the Directed Project is based on both the written report and its oral presentation.

Final Review and Graduation Certification:

When all requirements for the program have been completed, the student’s advisor will notify the Graduate Program Director, who will recommend that the student be awarded the Master of Science in Technology degree.

Additional Information on Directed Project:

The Directed Project - A Definition

The directed project is defined as an applied research project that is more extensive and sophisticated than a graduate-level independent study and less formal than a masters thesis. The overall objective of the requirement is to engage each graduate student in a study, typically industry or business focused, which is sufficiently involved as to require more than one semester to conceive, conduct, and report. The focus is to be placed on a topic with practical implications rather than original research.

Directed Project Characteristics

- Written for industry
- Includes a business presentation
- Results in a) a tangible product of value to business and industry, or b) education for business and industry
- Can be measured in dollars, but this is not a requirement
- Usually involves a technology problem solving activity
- Is documented to permit replication
- Can be published, but this is not a requirement
- Usually involves some form of business or industrial validation
- Generally requires application of a synthesis of coursework

Purposes of Directed Projects

Successful completion demonstrates:

- Ability to identify a business or industry relevant solution to a technology problem
- An ability to define and/or validate a business or industry relevant problem
- Addressing of a technological problem in a systematic and replicable manner
- Effective use of technical/professional research and/or development procedures
- Identifying criteria for success/solution of the problem
- Gathering information appropriate to the problem by employing business research procedures (e.g., 70% business/industry sources and 30% academic sources versus the reverse)
- Ability to document the research and development activity in a manner that permits replication and assessment of key decisions and alternatives
- Write effectively in a form customary to business and industry
- Prepare and deliver a presentation in a form customary to business and industry

Effective Directed Project Practices

- Directed projects should require students to select and employ an effective Research & Development procedure(s) to address the problem.
- A directed project generates a new solution, product or procedure. It may involve “proof of concept” and it must be of direct value to business or industry or to the education for business or industry.

- Directed projects should incorporate a strategic financial overview component depicting such characteristics as cost, ROI (Return on Investment), etc.
- A component of the directed project should be an Implementation Plan (i.e., recommendations for deploying the developed solution). This plan should include the suggested near and mid term steps.
- Industry partners are encouraged for validation or other involvement.
- Teams of students working on larger projects are permissible as long as each has a unique and significant contribution and that there is a high degree of independence so that one student's success is not predicated on another's.
- Employ either a) business or industry style manuals such as the *Chicago Manual of Style*, b) other relevant business/industry writing style manual, or c) the APA manual when required by the advisor.

Directed Project Report Format

- Executive summary
- Introduction
- Project Report Body
 - Section 1: Statement of the problem
 - Section 2: Significance of the problem
 - Section 3: Statement of purpose
 - Section 4: Background
 - Relevant history
 - Definitions
 - Literature
 - Assumptions
 - Delimitations
 - Limitations
 - Section 5: Procedures employed
 - Development process, or
 - Methods
 - Data collection
 - Instrumentation
 - Analysis
 - Section 5: Time action plan
 - Section 6: Conclusions, recommendations, and financial implications
 - References
 - Appendices
- Business Writing Style Manual or preference of advisor

Directed Project Procedures

Directed Project XXX 598 Enrollment

Exact enrollment timing can vary, but at least two consecutive enrollments in XXX 598 are required. Typically, the first enrollment is for 1 semester hour of credit in the next-to-last (*but earlier enrollment is permitted if appropriate*) academic term. During this academic session, a proposal is developed and approved by the advisory committee. Subsequent registration in XXX 598 is not permitted until the approved and signed proposal has been filed in the Graduate Studies Office. The second XXX 598 enrollment is for 2 semester hours of credit, in which the study is conducted, the final report written, and the study defended in an oral examination.

Should the student not complete the project in the two enrollment periods describe above, s/he is required to enroll for 1 semester hour of credit each term until the project has been completed. The candidate must be enrolled in XXX 598 for at least 1 semester hour of credit in the academic session in which the degree is awarded.

Grades for XXX 598 Directed Project Research

Performance in any XXX 598 Directed Project course is graded using the following scale:

- Pass – used where the student has met or exceeded requirements
- No Pass – used where the student has not met requirements and has not invested appropriate amounts of effort
- Incomplete – used where the student has invested appropriate amounts of satisfactory effort but the project is not yet finished
- Unsatisfactory – used where the student has not met requirements and has not invested appropriate amounts of effort
- Incomplete – used where the student has invested appropriate amounts of satisfactory effort but the project is not yet finished

Preparing Directed Project Proposal

There are no absolutes in the preparation of a directed project proposal. Every individual and every proposed project is unique. The exact approach that the student takes is ultimately at the discretion of the major professor (advisor) and the student's graduate committee.

It does not matter whether a proposal is being prepared for a graduate advisory committee or for an employer. Proposals must be succinct and direct. Clear, jargon-free prose that establishes the need for the study and a proposed method of solution are required--nothing more (or less). While MS Tech faculty have not established specific proposal length requirements, a proposal should be sufficiently detailed to enable the graduate committee to render effective judgment and share appropriate advice on how to proceed. Typically, Directed Project proposals are 15-20 pages (including figures, tables, and references but not counting appendices) to communicate essential detail. Beyond content, there are two important factors in the writing of any professional paper, be it a proposal or a final report. One factor is format; the other is style. Format is the physical layout of a paper. Rules for indention, type face, line

length, etc., are considered format issues. Style requirements are created to facilitate clear communication. Globally, style indicates the manner of expression and the sequence in which material is organized. At a micro level, style concerns formality, person, tense, spelling, and abbreviation standards. Both are important, and both have their place. Most publication manuals include both style and format guidelines.

Proposals are always written in future tense. Thus, statements that refer to procedures should be stated as, "This proposed study will collect data using . . ." or "Results of this study will be used to" Similarly, MS Tech program standards recommend that the proposal be written in third person. It is seldom necessary to refer to oneself in a formal paper. A writing style that does not include either personal identification with a personal pronoun (I, we) or a given name (Jane Doe) should be used. If such a strategy is not possible, an appropriate third person term such as "this developer" or "this researcher" should be chosen. This practice should be used only as a last resort, as it is considered ambiguous in most cases.

Directed Project Proposal Contents

Cover Page

The cover page must follow the format as suggested by the IPFW *Office of Graduate Studies* or by your advisor. This format includes spaces for each advisor to sign and date the proposal. The original signed proposal must be submitted to the *Office of Graduate Studies* as soon as it has been signed by all committee members. This original document then becomes the contract for the directed project.

Committee member information should be entered using the first name, middle initial, and last name. Do not use academic or degree titles such as Professor, Dr., etc., before the name. List the major professor (committee chairperson) first, the second person from the primary area next, and then each related area advisor. The committee member's relationship to the plan of study should be listed below his/her name. Thus, if the primary area on the plan of study is listed as "Information Technology", the committee chairperson (major professor) and the second person from the primary area would be listed as follows.

_(name of your advisor)____, Chair
Computer Engineering Technology

_(name of committee member)____
Computer Engineering Technology

If the plan of study included two related areas titled "Communications" and "Information Technology", the committee members would be listed as follows.

(name of faculty member)
Communications

(name of faculty member)
Computer Engineering Technology

Abstract/Executive Summary

The student must prepare a one (maximum) page abstract that succinctly describes the proposed project's problem addressed, purpose for the study, the significance of the proposed study, an overview of the proposed methods to be employed and of the anticipated deliverables.

Introduction

The form of the introduction will vary with the nature of the proposed project. Typically they range are 1-3 pages in length. It is important to remember that this is the sole chance to establish a frame of reference in the reader's mind. Appropriate introductions are brief and designed to establish the need for a study. There is no "right way" to write an introduction. There are, however, several possible ways to craft an introduction that will accomplish its intended goal. One common method is to identify the problem in global (vis-à-vis specific) terms. This approach creates an overall frame of reference that makes it much easier for the reader to focus on the more detailed portions of the proposal.

Another method is to identify a plausible alternative to established methods of addressing the problem at hand. For example, sometimes when employing conventional methods, an unexpected outcome (anomaly) occurs. Given this, the proposal could be focused on ascertaining if the outcome was due to chance whether other factors exist that would make the unexpected a more likely future occurrence. Given the pace of development, often wholly new techniques or procedures may offer an alternative to current methodologies. The beginnings of these new approaches are placed in the introduction to set the stage for the proposed project.

Statement of the Problem

There is no section of a proposal that gives beginning proposal writers more challenges than the "Statement of the Problem" section. Too often their early drafts present either a restatement of the introduction, a detailed description of the methods to be used, or a suggested solution. None of these are appropriate statements of the problem. A problem is something that is wrong. Therefore, the statement of the problem is merely a brief description of what is wrong, written in specific enough terms that the reader can see the problem and not simply a problem space. One test of the quality of a problem statement is always, "Could the problem be recognized if the statement were being read for the first time?"

Significance of the Problem

Once the problem has been stated, the significance of the problem must be established. The significance section should be drafted in a manner that removes any question of the importance of the proposed study. In the context of a directed project or thesis, this is the part of the proposal in which the proposed project is tied to the student's overall plan of study and career goals. Generally, this section should "sell" the project as being worthy of doing in the business/industry and/or academic/disciplinary context. One of the effective methods of strengthening this section is to highlight key citations from credible sources that indicate that the problem is real and that things would be better if it were solved.

Statement of the Purpose

Once the problem and its significance have been stated, the purpose of the project must be described. Here is where the student indicates what they propose to do about the problem, i.e., what part of it they wish to address and what the deliverables of their work will be.

Definitions

Definitions must be included in a directed project proposal whenever it is necessary to inform the reader of the unique way in which the terms are to be used in the proposed research. For example, if learning is to be defined as "a change in behavior", both the entering and terminal behaviors must be defined. But, when terms are used in standard ways, it is not necessary to include the definitions. If acronyms are used to reduce volume/repetition in a proposal, convention requires the term to be spelled out in full the first time it is used and then followed by the acronym in parentheses. Thereafter, the acronym may be used in lieu of the full term.

Assumptions

Every study requires some assumptions; they will vary with the type of problem. For example, one assumption could be that all members of the group being studied know Windows-based operating systems. Another assumption may be that employees will be willing to participate in the training exercise being proposed. Assumptions, of course, must be established as part of the proposal writing stage and they must be approved by the major professor and committee.

Delimitations

Delimitations are restrictions in the scope of a project, i.e., statements about things that you will NOT address. There are always constraining factors in a study. This is particularly true of directed projects in which time, money, and other resources are limited to those that the individual student can bring to the study.

A delimitation is a factor that will narrow the scope of the study being proposed. This is a factor that is known about before the study is performed. For example, one delimitation may be that time does not allow a follow-up after the initial treatment or evaluation. Will the study be limited to a single facility of Corporation X, or will it be conducted at multiple sites? Clearly, a multiple-site study is more generalizable than a study at a single location. The signed proposal is the contract for the study. If the proposal were ambiguous about its limits, the student could be in the position of having to gather further information.

Note that delimitations are distinctly different from limitations. A limitation is a weakness or restriction on inference. An example would be a survey having a response rate low enough to produce unreliable and invalid information.

Limitations

Limitations are descriptions of weaknesses of a study. If the student knows about these at the time of generating the proposal they are advised to reveal them explicitly in advance. Often, however, in addition to any weaknesses known in advance of conducting a project, some invariably arise during the course of project execution. When this occurs, these new limitations are to be added to the limitations section of the final project report and they must be taken into account when discussing the project conclusions.

Review of Literature/Background

The review of literature serves several important functions. First, it is a method to indicate that the problem is more universal than the specific proposal. Second, it serves as a justification for the proposed study in that others have addressed related problems. Third, it positions the work in the field giving context to what has and has not been done and where this project/thesis is positioned therein. Fourth, it identifies possible methods for the conduct of the study by identifying possible data collection strategies, statistical procedures, or sources of other procedural information. Finally, the review of literature should document justification for the proposed study.

There are three principle justifications for additional investigation of a problem. One justification is that there are plausible alternative hypotheses to conclusions reported in existing studies. That is, there may be another possible variable that is influencing the results of existing studies. The second reason for proposing a new study is to determine if the reported study can be duplicated (replicated) in a new environment. A third reason for conducting a study accounts for the introduction of new data or procedures that have become available. In this case, the review of literature serves to demonstrate that no examples of the use of new techniques could be found.

Typically reviews of the literature sections include some appropriate description of four sections:

- A description of the methodology and terms employed to conduct the review of the literature itself
- A description of the problem and its significance
- A description of the literature pertinent to choices of data collection and analysis
- A summary of the review of the literature section

For the purposes of a proposal, the review of literature should focus on the key studies. These cannot be determined without extensive review of the literature prior to the preparation of the proposal. The review must be sufficiently extensive to insure that all sides of an issue have been researched and that a balanced evaluation of the problem area has been accomplished. Because a proposal is limited by space constraints, only the most germane studies should be included.

Procedures (or Methodology)

All procedures to be used in the proposed study should be defined. Whenever possible, the proposed procedure should be justified by reference to other published studies that were used and recommend the steps defined. This will insure that the advisory committee understands the steps the student wishes to take and establishes those steps as appropriate in other published studies.

Time Action Plan

A time action plan establishes the time frame in which the conduct of the proposed study will occur. This section is vital when there are strict time constraints on data collection or other factors affecting the conduct of the study. This plan also helps communicate the student's proposed time allocation for each major component of the project. Many proposed studies will demand a time action plan. Students should use a Gantt chart or any other ways to show the timeline of their project action plan.

Post-Project Activities

Appointment of the Examining Committee & Scheduling the Final Oral Examination

The examining committee will usually be identical to the student's direct project advisory committee. The major professor and student are jointly responsible for finding a common date, time, and period when all advisory committee members can meet for the examination and this must occur within the deadlines established by the *Office of Graduate Studies*. The major professor is expected to take initiative in assisting the student with this procedure. The date, time, period, facilities, and equipment needs for the meeting are to be transmitted to the M.S. Tech program office by the major professor.

Following the notice of final examination date, the M.S. Tech program office will schedule an appropriate meeting room (equipment other than standard equipment offered by IPFW Learning Resources Center is the responsibility of the student to arrange), prepare the necessary forms.

The M.S. Tech program office will then distribute copies of approved forms to the student and all advisory committee members. This activity must be completed no less than three weeks prior to the examination date.

The day prior to the final examination date, the M.S. Tech program office will forward a file of relevant student records, including any necessary forms, Report of the Examining Committee, and candidate audit forms to the major professor.

If, however, the examining committee is to be different from the advisory committee (for example, when a committee member is unable to serve), a replacement member must be appointed, a Request for Appointment of Examining Committee form completed and submitted to the M.S. Tech program office to be forwarded to the Office of Graduate Studies (IPFW), no less than two weeks prior to the examination date.

It is the major professor's responsibility to obtain all required committee member signatures and return the signed form to the M.S. Tech program office in advance of the established deadlines.

Completing the XXX 598 Requirement

At the conclusion of the final oral examination, the major professor and each member of the examining committee will sign the Report of the Examining Committee form; the major professor will forward the form to the Office of Graduate Studies for processing.

NOTE: The Office of Graduate Studies permits **NO EXCEPTIONS** to the deadline. If all degree requirements are not met in the semester in which candidacy is declared, the student must register for 1 semester hour of XXX 598 each subsequent semester until all requirements are met.

If any problems or deficiencies in the report are indicated by the examining committee, these must be corrected before the project or report will be approved by each committee member. In order for graduate to occur during any semester, completion of all required edits/corrections must occur and be approved before the established deadlines.

The last step involves submitting a copy of the approved project report to each of the following.

- The academic department
- The major professor
- Each member of the examining committee requesting a copy
- IPFW Helmke Library

Course Offering Cycles*

In an effort to facilitate advance planning by both faculty and graduate students, the department will make every effort to offer core graduate courses on a fixed cycle, designated as Cycle A and Cycle B below. Most elective courses are offered on a bi-annual (i.e., every other year) basis as well. Since the Masters of Science in Technology program has a rolling admission process, a student's particular sequence depends upon which cycle the department is in at the time student first registers for classes. These course cycles do not account for any undergraduate courses a student is required to take as part of their admission to this program or any other undergraduate courses, as those courses do not count towards graduation.

International Students: This course offering cycle may not be applicable to international students who have additional requirements to maintain their student visa status. It is student's responsibility to contact the IPFW Office of International Students to figure out those immigration requirements and abide by them.

Two-Year Graduate Course Cycle for Full-Time Students:

The Master of Science in Technology is a 33-credit program. This schedule totals 36 credit hours since one must be enrolled for 9 credit hours per semester to be classified as a full-time student.

CYCLE A	CYCLE B
Semester 1, Fall IT 508 Quality and Productivity in Industry and Technology Required Technical Specialty Course Technical/Leadership Elective	
Semester 2, Spring IT 507 Measurement and Evaluation in Industry and Technology Required Technical Specialty Course Technical/Leadership Elective	Semester 1, Spring IT 507 Measurement and Evaluation in Industry and Technology Required Technical Specialty Course Required Technical Specialty Course
Semester 3, Fall TECH 646 Analysis of Research in Industry and Technology Required Technical Specialty Course Directed Project I	Semester 2, Fall TECH 646 Analysis of Research in Industry and Technology IT 508 Quality and Productivity in Industry and Technology Required Technical Specialty Course
Semester 4, Spring Directed Project II Technical/Leadership Elective Required Technical Specialty Course	Semester 3, Spring Required Technical Specialty Course Technical/Leadership Elective Directed Project I
	Semester 4, Fall Directed Project II Technical/Leadership Elective Technical/Leadership Elective

* Actual course offering is subject change depending upon the availability of instructor and students. Check MS Tech website for the available courses for the current and the following semester. Further, summer class and online course schedule (which may be offered in future) are not mentioned here.

Three-Year Graduate Course Cycle for Part-Time Students:

Students who attend the program part-time will find the following three-year graduate course sequence to be helpful with respect to completing all degree requirements.

CYCLE A	CYCLE B
<p>Semester 1, Fall IT 508 Quality and Productivity in Industry and Technology Technical/Leadership Elective</p>	
<p>Semester 2, Spring IT 507 Measurement and Evaluation in Industry and Technology Required Technical Specialty Course</p>	<p>Semester 1, Spring IT 507 Measurement and Evaluation in Industry and Technology Required Technical Specialty Course</p>
<p>Semester 3, Fall Required Technical Specialty Course Technical/Leadership Elective</p>	<p>Semester 2, Fall IT 508 Quality and Productivity in Industry and Technology Technical/Leadership Elective</p>
<p>Semester 4, Spring Required Technical Specialty Course Technical/Leadership Elective</p>	<p>Semester 3, Spring Required Technical Specialty Course Technical/Leadership Elective</p>
<p>Semester 5, Fall TECH 646 Analysis of Research in Industry and Technology Directed Project I</p>	<p>Semester 4, Fall TECH 646 Analysis of Research in Industry and Technology Required Technical Specialty Course</p>
<p>Semester 6, Spring Directed Project II Required Technical Specialty Course</p>	<p>Semester 5, Spring Required Technical Specialty Course Directed Project I</p>
	<p>Semester 6, Fall Directed Project II Technical/Leadership Elective</p>

Five-Year Graduate Course Cycle for Part-Time Students:

The five year cycle may be advantageous to students who are only able to take one class per semester. However, Purdue University policy requires each student to complete their MS program within five years. It can not be extended beyond five years.

CYCLE A	CYCLE B
Semester 1, Fall IT 508 Quality and Productivity in Industry and Technology	
Semester 2, Spring Required Technical Specialty Course	Semester 1 Spring Technical/Leadership Elective
Semester 3, Fall Required Technical Specialty Course	Semester 2 Fall IT 508 Quality and Productivity in Industry and Technology
Semester 4, Spring IT 507 Measurement and Evaluation in Industry and Technology	Semester 3 Spring Required Technical Specialty Course
Semester 5, Fall Required Technical Specialty Course Required Technical Specialty Course	Semester 4 Fall Required Technical Specialty Course Required Technical Specialty Course
Semester 6, Spring Technical/Leadership Elective	Semester 5 Spring IT 507 Measurement and Evaluation in Industry and Technology
Semester 7, Fall TECH 646 Analysis of Research in Industry and Technology	Semester 6, Fall Technical/Leadership Elective
Semester 8, Spring Technical/Leadership Elective	Semester 7, Spring Technical/Leadership Elective
Semester 9, Fall Technical/Leadership Elective Directed Project I	Semester 8, Fall TECH 646 Analysis of Research in Industry and Technology
Semester 10, Spring Directed Project II	Semester 9, Spring Required Technical Specialty Course Directed Project I
	Semester 10, Fall Directed Project II

University Policies

Individual Rights and Responsibilities as Students

(2007-2009 Graduate Bulletin pgs. 162-163)

1. Degree-seeking students have the responsibility for selecting a major field of study, for choosing an appropriate degree program within the discipline, for planning class schedules, and for meeting the requirements for degrees. IPFW will provide advisors to assist students in academic planning, but students are responsible for being knowledgeable about all academic requirements which must be met before a degree is granted.
2. Students have the right to receive accurately and plainly stated information which enables them to understand clearly:
 - a. the general qualifications for establishing and maintaining acceptable academic standing within a particular major and at all other levels within IPFW,
 - b. the graduation requirements for specific curricula and majors, and the course objectives, requirements, and grading policies set by individual instructors for their courses.
3. In the classroom, students have the freedom to raise relevant issues pertaining to classroom discussion, to offer reasonable doubts about data presented, and to express alternative opinions to those being discussed. However, in exercising this freedom, students shall not interfere with the academic process of the class.
4. Students' course grades shall be based upon academic performance, and not upon opinions or conduct in matters unrelated to academic standards. Students have the right to discuss and review their academic performance with their instructors. Students who feel that any course grade has been based upon criteria other than academic performance have the right to appeal through the IPFW grade appeals system. [\[See IPFW Academic Regulations-Grade Appeals.\]](#)
5. Students have the right to obtain a clear statement of basic rights, obligations, and responsibilities concerning both academic and personal conduct.
6. Students have the right to participate in the formulation of IPFW policies which directly affect them. In exercising this right, students have the right of access to appropriate information, to express their views, and to have their views considered.
7. Students have the privacy rights specified in the IPFW policy on the release of student information. (See IPFW Academic Regulations-Release of Student Information)

Incompletes

(2007-2009 Graduate Bulletin pg. 151)

A grade of I may be granted to students

1. who are unable to complete specific course requirements for clearly unavoidable, nonacademic reasons (such as extended illness or relocation) and
2. whose work has been of passing quality up to that time.

A grade of I will not be considered as an alternative to an anticipated low grade in a course. Certain IPFW schools/divisions or departments impose additional limitations on the use of I grades.

An instructor who reports a grade of I must provide the registrar's office with a form specifying

1. the reason for the incomplete,
2. the requirements for completing the course,
3. the grade earned for the course to date, and
4. the specific time limit, not to exceed one calendar year, allowed for completing the course.

An instructor may change the incomplete to a regular letter grade if requirements for the completion of the course are not met within the time specified. Given extenuating circumstances, the initial time limit may be extended for a period not to exceed one additional calendar year if approved by the instructor and the instructor's dean/division director, and if the registrar's office is notified before the expiration of the original time limit.

The registrar's office changes the I to a grade of IF unless you graduate or remove the incomplete within the time allowed. If you are enrolled at IPFW as an Indiana University student and receive an IF grade, a grade of F is recorded on your official transcript. If you re-enroll in the same course while the I is still on your record, and the course is not repeatable for credit, the original grade of I remains on your official transcript.

If you transfer resident credit for a course in which you received an incomplete, you will have the grade of I recorded on your academic record for up to one calendar year from the date of admission to IPFW. At the end of this period, if you have not graduated or provided evidence that the incomplete has been replaced with a permanent grade, the registrar's office will change the incomplete to IF.

Academic Grade Appeals

(2007-2009 Graduate Bulletin pg. 153)

The grade appeals policy applies to all students enrolled at IPFW. It can be used by any student who has evidence or believes that evidence exists to show that a course grade was assigned or a similar evaluation was made as a result of prejudice, caprice, or other improper condition such as mechanical error.

In appealing, the student must support in writing the allegation that an improper decision has been made and must specify the remedy sought. The student should seek the assistance of the dean of

students in pursuing the appeal. During an appeal, the burden of proof is on the student, except in the case of alleged academic dishonesty, where the instructor must support the allegation. The student may have an advisor or friend present during all meetings with faculty members, administrators, and/or committees; he or she may advise the student but may not speak for the student during the meetings.

Grades may be changed only by a university authority upon the decision of the Grade Appeals Subcommittee, or by the instructor any time prior to the decision of the Grade Appeals Subcommittee.

Affirmative Action, Nondiscrimination, and Nonharassment (2007-2009 Graduate Bulletin pg146)

IPFW is committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the university seeks to develop and nurture diversity. The university believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

IPFW views, evaluates, and treats all persons in any university-related activity or circumstance in which they may be involved solely as individuals on the basis of their personal abilities, qualifications, and other relevant characteristics.

IPFW prohibits discrimination against any member of the university community on the basis of race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability, or status as a disabled or Vietnam-era veteran. The university will conduct its programs, services, and activities consistent with applicable federal, state, and local laws, regulations, and orders and in conformance with the procedures and limitations as set forth in Purdue University's Executive Memorandum No. D-1, which provides specific contractual rights and remedies. Additionally, the university promotes the full realization of equal employment opportunity for women, minorities, persons with disabilities, and Vietnam-era veterans through its affirmative action program.

Nonharassment (2007-2009 Graduate Bulletin pg. 146)

It is the policy of IPFW to maintain the campus as a place of work and study for faculty, staff, and students free from all forms of harassment. In providing an educational and work climate that is positive and harassment-free, faculty, staff, and students should be aware that harassment in the workplace or the educational environment is unacceptable conduct and will not be tolerated. This policy addresses harassment in all forms, covering those with legally protected status for reasons of race, gender, religion, color, age, national origin or ancestry, or disability, as well as those who are harassed for other reasons such as sexual orientation.

Research Involving Human Subjects

As part of their coursework, practicum or thesis, students may choose to conduct research that will involve the collection of primary research data or the use of secondary data via the use of human

subjects. Students should be aware that any research which involves human subjects must first be approved by the Committee on the Use of Human Research Subjects at Purdue University. The instructions for submitting an application, other general guidelines, and all relevant forms necessary to obtain approval from the Committee on the Use of Human Research Subjects at Purdue University are located at their website: <http://www.irb.purdue.edu/>.

Masters of Science in Technology Program Expectations

Expectations of Graduate Students

Graduate students should conduct themselves in a professional manner at all times.

Graduate students should budget their time wisely so that all course requirements will be met during the semester they are registered for a course. The granting of an incomplete must involve extenuating circumstances.

Since e-mail is the primary means of communicating official department announcements to students, each graduate student is responsible for making sure that the Graduate Secretary and Graduate Program Director have the student's most up-to-date active e-mail address. Faculty will make every effort to respond to emails in a timely manner.

Expectations of Graduate Teaching Assistants

Teaching assistants will be responsible for independently teaching a class. Course assignments are made in consultation with the Graduate Program Director and the chair of the Department offering courses in the area of the students' technological specialization.

Criteria for the Selection of Graduate Teaching Assistants

1. Preference will be given to those enrolled in the Program for 6 or more hours at the time they teach.
2. Must be a Graduate student in good standing.
3. Preference will be given to those who have completed more courses in our graduate program.
4. Preference will be given to those who have leadership or previous teaching experience.
5. Graduate GPA's will be considered.
6. Consideration will be given to students whose career goals involve teaching.

Expectations of Graduate Research Assistants

Graduate research assistants will participate with faculty of the Master of Science in Technology Graduate Program in research on a variety of topics.

Applicants should have sufficient background in technology and research methods. Applicants should be able to follow instruction and work independently on research topics as assigned by faculty. Skills

in library research, word processing and statistical analysis are expected. The position requires between ten and twenty hours per week.

Duties of a graduate research assistant include, but are not limited to assisting in management of the research project, data collection, dataset management and analysis of data, assistance with literature reviews and reference acquisition, preparation of tables and reports, secretarial duties and website maintenance and development. Other duties may also include research participant recruitment, scheduling appointments, interviewing research participants, data transcription, writing up results and participation in research team meetings. Other work assignments may include assisting with the preparation of grant proposals. Specific duties will be clearly designated by the principal investigator prior to the beginning of the appointment. However, research assistants should be aware that additional duties may occur depending upon the research project.

The research assistantship provides the student with an experience of a particular methodology, or participation in a research study related to one's area of interest.

Appendix A: Masters of Science in Technology – Approved Purdue University Graduate Faculty

Faculty	Department	Email	Areas of Expertise/Research Interests
Broberg, Harold	CEIT	broberg@ipfw.edu	PIC Microcontrollers, Control Systems, Sensors/Transducers, Students Learning Styles
Goodman, Peter	CEIT	goodmanp@ipfw.edu	Digital Circuits: Design/Development, VHDL
Hack, Iskandar	CEIT	hack@po.ipfw.edu	Digital Circuits: Design/Development, VHDL
Laverghetta, Thomas	CEIT	laverghet@ipfw.edu	Fiber Optics, Microwave communications
Lin, Paul	CEIT	lin@ipfw.edu	
Luo, Hongli	CEIT	louh@ipfw.edu	
Steffen, Gary	CEIT	steffen@ipfw.edu	Networking, wireless, security, digital systems
Albayyari, Jihad	MCET	albayyaj@ipfw.edu	Thermodynamics, HVAC system design and optimization, Heat and mass transfer
Ding, Suning	MCET	dings@ipfw.edu	Interior Design
Dupen, Barry	MCET	dupenb@ipfw.edu	Metallurgy
Kubik, Matthew	MCET	kubik@ipfw.edu	Interior Design
Leffers, Regina	MCET	leffersr@ipfw.edu	Sustainable approaches in construction
Liang, Zhonming (Wilson)	MCET	Liang4@purdue.edu	Machine elements, Mechanisms, CNC programming, and Robotics applications
Marshall, DJ	MCET	marshald@ipfw.edu	Architectural Design and Methods
Narang, Ramesh	MCET	narang@ipfw.edu	Quality, Work methods, design, lean manufacturing, production planning, design for manufacture
Nepal, Bimal	MCET	nepalb@ipfw.edu	Product development, systems engineering, applied statistics, quality engineering, optimization, lean manufacturing and six-sigma methodologies
Pablo, Reynaldo	MCET	pablora@ipfw.edu	Structural engineering and design
Pugh, Allen (part. Ret.)	MCET	pugh@po.ipfw.edu	Stochastic simulation and control