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# *PROFESSIONAL MASTER OF SCIENCE AND TECHNOLOGY HANDBOOK*

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**Director's Message**

Since 2002, the Professional Master of Science and Technology program's guiding principle has been to offer a program of study for students who want to develop the science, technical and business skills required for management careers in technology-based industries, government agencies, or non-profit organizations.

"Developing talent" is a significant concern as technology companies along the Wasatch Front seek to grow or create businesses with potential for growth. These companies require individuals with strong technical capabilities. Still, the modern business environment using cross-functional teams also requires employees to be effective communicators, understand how their contributions fit into their company's overall strategy, and can lead projects to completion.

Professional Master of Science and Technology graduate students, working through their courses of study and the capstone Professional Experience Project, can address these needs. They have the opportunity to increase their technical knowledge in a Science Track aligned with their discipline, develop the business skills required for effective management, and then put them into practice.

Following our guiding principle, we will continue to improve the program and increase benefits to its students and the community of businesses that The University of Utah seeks to serve.

## Safety and Wellness

Your safety is our top priority. In an emergency, dial 911 or seek a nearby emergency phone (throughout campus). Report any crimes or suspicious people to 801-585-COPS; this number will get you to a dispatch officer at the University of Utah Department of Public Safety (DPS; [dps.utah.edu](https://dps.utah.edu)). If, at any time, you would like to be escorted by a security officer to or from areas on campus, DPS will help — just give a call.

The University of Utah seeks to provide a safe and healthy experience for students, employees, and others who make use of campus facilities. In support of this goal, the University has established confidential resources and support services to assist students who may have been affected by harassment, abusive relationships, or sexual misconduct. A detailed listing of University Resources for campus safety can be found at <https://registrar.utah.edu/handbook/campussafety.php>

Your well-being is key to your safety. If you are in crisis, call 801-587-3000; help is close. The University has additional excellent resources to promote emotional and physical wellness, including the Counseling Center (<https://counselingcenter.utah.edu>), the Wellness Center (<https://wellness.utah.edu>), and the Women's Resource Center (<https://womenscenter.utah.edu>). Counselors and advocates in these centers can help guide you to other resources to address a range of issues, including substance abuse and addiction.

## INTRODUCTION

The Professional Master of Science and Technology (PMST) Program is a non-thesis, interdisciplinary program that fuses graduate studies in science and mathematics with skills from other professional domains, such as business, management, communication, and data analysis. A fundamental part of the PMST Program degree requirements is the development and completion of a Professional Experience (internship) project, which applies the science and business skills learned in the program curriculum.

The degree is offered through the College of Science and the College of Mines and Earth Sciences. The program is administered through The Graduate School.

## DISCLAIMER

Efforts are made to ensure the information in this document is accurate; however, policies of The University of Utah and The Graduate School will take priority in the event of a discrepancy with policies provided in this document.

## PROGRAM DEGREE REQUIREMENTS

### REGISTRATION

PMST graduate students register via The University of Utah web site to secure their classes.

### MINIMUM CONTINUOUS REGISTRATION

All PMST graduate students must be registered for at least one course from the time of formal admission through completion of all requirements for the degree they are seeking, unless granted an official leave of absence (see Leaves of Absence section, below). Students not on campus and not using University facilities are not expected to register for the summer term. Students must, however, be registered during the summer term if they are taking examinations. If students do not comply with this continuous registration policy and do not obtain an official leave of absence, they will be automatically discontinued from the PMST program. In this case, students will be required to reapply for admission to the University through Graduate Admissions upon approval of the home department. Students should be registered for graduate-level courses (5000-6000 level) until they have completed all requirements for the degree, including the Presentation of the Professional Experience (Internship) Project.

### LEAVES OF ABSENCE

Students who wish to discontinue their studies for one or more semesters (other than summer term) must complete a *Request for Leave of Absence Form* (available from the Office of the Registrar). The form must be approved and signed by the Supervisory Committee Chair (if established) and the Program Director.

Requests for leaves of absence may be granted for up to one year for circumstances related to:

- a serious health condition of the student or family member,
- parental leave to care for a newborn or newly adopted child,
- a call to serve in military service, or
- other compelling reasons that the student's department believes is in the best interests of both the student and the University.

Students who experience a medical condition associated with their pregnancy and need accommodations recommended by their medical provider should contact the University's Title IX Coordinator, who will work with the student, cognizant faculty, and administration to determine what accommodations are reasonable and effective.

The form requesting a leave of absence for a current semester must be completed by the student and received in The Office of the Registrar by the last day of classes of that semester. Leaves of absence are not granted retroactively. Students must officially withdraw from classes in any semester for which a leave is granted; failure to formally withdraw results in the reporting of E or EU grades for all classes.

The period during which a leave of absence is granted does not count toward the period allowed to complete the degree. Leaves are granted for a maximum of one year at a time, and may be renewed by submitting a new *Request for Leave of Absence* form to The Office of the Registrar. The leave of absence is void if a student registers for classes in a semester for which a leave was granted.

### MINIMUM ACCEPTABLE GRADES

PMST students are required to maintain a 3.0 or higher GPA in course work counted toward the degree. Failure to maintain a 3.0 or higher GPA for two consecutive semesters may lead to students being discontinued from the PMST Program after review by the Program Director and consultation with the Executive Committee and Dean of The Graduate School. A grade below C- is not accepted for credit toward a graduate degree.

### MAXIMUM HOURS

No candidate for a graduate degree is permitted to register for more than 16 credit hours in any single semester. A schedule of nine hours is considered a full load for master's candidates. Requests for exceptions to this policy should be submitted in writing to the Dean of The Graduate School by the student's supervisory committee chair. Students in the Tuition Benefit Program (TBP) are advised to refer to the TBP information page to review policies related to maximum hours. <http://gradschool.utah.edu/tbp/tuition-benefit-program-guidelines/>

### COURSE REQUIREMENTS

The Professional Master of Science and Technology Program is a science and/or mathematics graduate degree; students in the program take approximately the same number of graduate-level science and mathematics courses as traditional Master of Science programs require. Instead of a research requirement, PMST students take courses in Advanced Quantitative Skills, Business, Management and complete a Professional Experience Project.

The 36 credit hours required for the degree are fulfilled in a four-part framework:

#### Advanced Quantitative Skills (5-7 Credits)

Students complete MST 6600 Applied Statistical Techniques and one additional elective that focuses on computer modeling, data analysis, or productive computing.

#### Transferable Skills (12 Credits)

The Professional Master of Science and Technology program offers courses that provide students with business and management concepts essential for leading activities in a variety of organizations outside of academia. Various leadership, business, and management skills are taught in a series of seven PMST courses (9 credit hours). Students may fulfill the remaining three Transferable Skills credits required by taking elective courses in writing, communication or courses offered from the David Eccles School of Business.



### Professional Experience (3-4 Credits)

An essential component of this degree is a Professional Experience Project in industry, non-profit or government agency. These activities will engage students in real-world work situations involving technical problems, teamwork, communication skills, and decision making. Students are encouraged to take MST 6974 Professional Experience Project Planning (1 credit hour) prior to enrolling in MST 6975 (3 credit hours).

### Science Track Courses (15 or 16 Credits)

**Biotechnology**

**Computational Science**

**Earth Resource Management**

**Environmental Science**

**Scientific Instrumentation**

### Curriculum Degree Plan Worksheet

The PMST Program provides an Excel worksheet for students to plan and track their individual courses of study. This Excel file is available on the Canvas website or from the PMST Project Coordinator. The Project Coordinator can provide guidance on completing the worksheet. Once complete, students should review their proposed course of study with their Track Director. When completed, the Project Coordinator enters the program of study into the University Grad Tracking system; the Supervisory Committee approves the program of study using the Grad Tracking system.

### Petition for Curriculum Change—Instructions

Students who identify a course not listed in the Curriculum Degree Plan Worksheet can petition to have that course approved as part of their program of study. Students must complete the following steps:

1. Complete the Science Track Curriculum Degree Plan Worksheet in its entirety, including the proposed change.
2. Using a University email account, send the following information to the Program Director in the body of the email:
  - Course Prefix, Course Number, and the course description from the catalog.
  - A brief statement that addresses the request and how it relates to your professional goals.

Your email should be written using a standard business format.

3. Attach your proposed Curriculum Degree Plan Worksheet and a recent copy of the syllabus for the course.

The Program Director will review the Petition for Curriculum Change for completeness. When complete, the Petition for Curriculum Change will be forwarded to the appropriate PMST Track Director or the student's Supervisory Committee Chair for approval.

If your petition is approved, you will not need to fill out the Science Track Curriculum Degree Plan Worksheet again before your graduating semester, provided you adhere to the curriculum plan you submitted. The petition process is outlined in Figure 1.

### PMST Science Course Petition Process

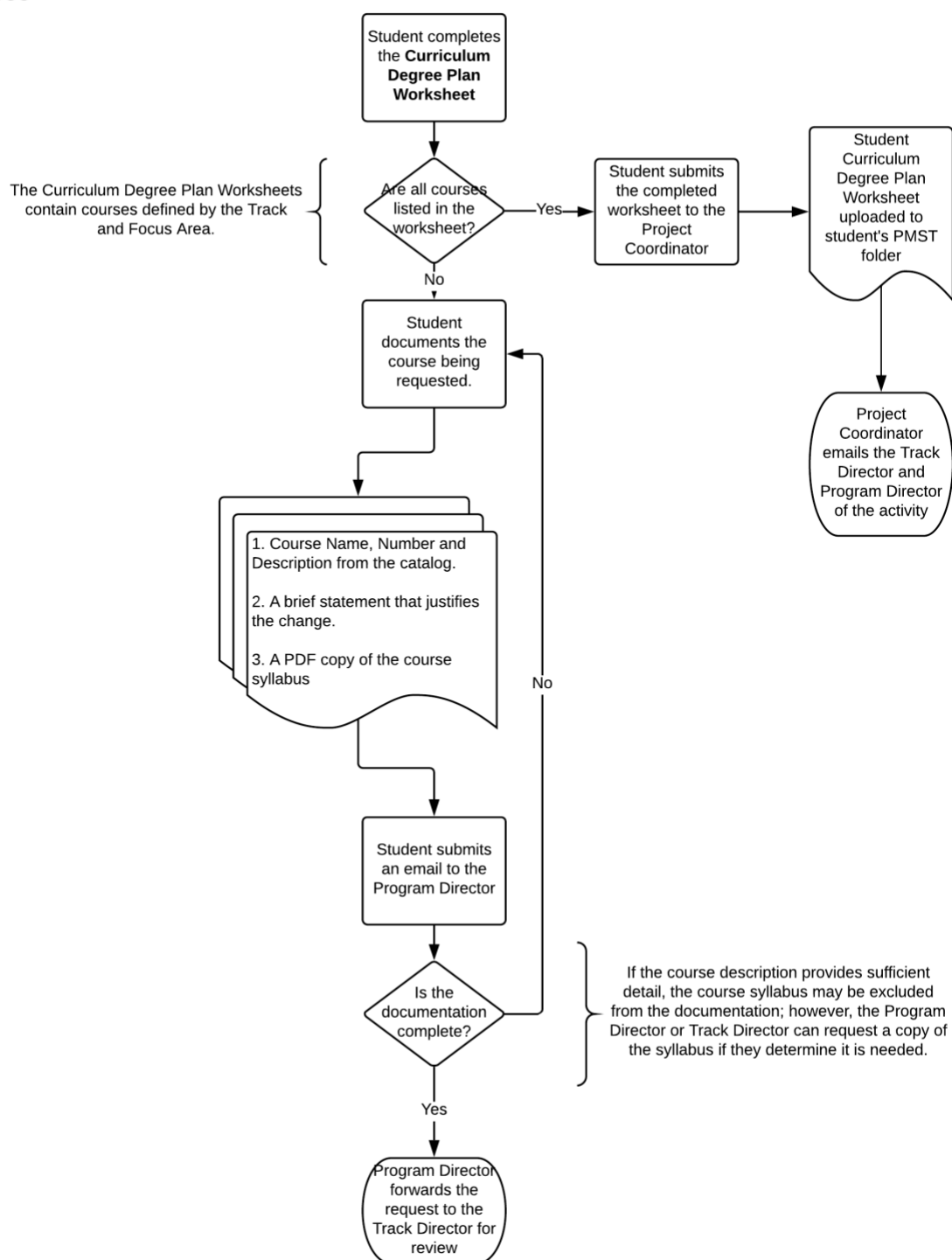


Figure 1. PMST Science course petition process flow chart.

### *Request to Change Science Tracks*

A student submits a petition to the PMST Executive Committee which includes a formal letter justifying the request and describing how their professional goals have changed since being accepted into the program. The petition must also include an updated Curriculum Worksheet showing the proposed plan of study. To initiate the change, the student must reapply to the PMST Program, selecting the desired track.

A petition to change tracks is not automatic and approval to change tracks does not guarantee acceptance into the new program of study.

Finally, the Executive Committee and appropriate Track Directors will review and approve the use of courses from one track to satisfy the requirements of the new track.

The Office of the Registrar will officially record the change if the petition request is approved and the new application accepted.

### *Credits Earned by Non-Matriculated Students*

Credits earned by non-matriculated students may or may not apply to the PMST graduate degree program. You must submit a petition if you wish to receive credit for non-matriculated credits, second bachelor's degree credits, or transfer of credits from another institution. Additionally, students are required to submit a signed statement indicating that such credits have not been used and will not be used to meet requirements for another degree. Students should follow the Petition for Curriculum Change Instructions above. Only nine semester hours of non-matriculated credit, taken no more than three years prior to approval, can be applied toward a graduate degree. Exception to either of these requirements must be requested by the Program Director or supervisory committee chair and approved by the Dean of The Graduate School.

### Credit/No-credit Grading

Graduate students are granted the option, subject to approval by the PMST program and review by the Dean of The Graduate School, to enroll in courses and be graded on a credit/no-credit (CR/NC) basis instead of receiving a letter-grade.

The intent of the CR/NC option is to free students to extend their studies to areas outside their program of study and to take classes they otherwise might not take if they had to compete with students from that department for a letter grade. The following apply to taking classes CR/NC:

- The PMST program does not allow students to take CR/NC classes during their first year of study.
- After their first year in the PMST program, a student may request permission from the Program Director (Director of Graduate Studies) or the Supervisory Committee Chair to register for no more than one class per semester on a CR/NC basis.
- The PMST program has flexibility to plan the best possible program with the student. The choice of courses to be taken CR/NC is subject to the approval of the Program Director or the Supervisory Committee Chair acting on behalf of the PMST program.
- Graduate students should earn a grade of C or better to be entitled to 'credit.' Students who do not wish to register for credit, either for a letter grade or CR/NC, should audit the course.
- Graduate students enrolled in a class for CR/NC may change to a letter grade any time before the Monday of the last week of classes. Graduate students are cautioned that it is important they receive letter grades in order to build a graduate GPA. This is especially important if students apply for fellowships or traineeships on a competitive basis or later transfer to another institution.

Additional considerations:

- CR/NC should not be used for any core course (focus area) or defined option (elective) required by the PMST degree.
- CR/NC is not counted towards the student's GPA. Taking courses CR/NC places "higher risk" on the remaining graded coursework.

## **ACADEMIC MISCONDUCT**

The PMST Program takes cases of academic misconduct seriously and follows the Policies of the University of Utah for academic misconduct and sanctions. The following information is from the University of Utah's Code of Student Rights and Responsibilities:

"Academic misconduct" includes, but is not limited to, cheating, misrepresenting one's work, inappropriately collaborating, plagiarism, and fabrication or falsification of information. It also includes facilitating academic misconduct by intentionally helping or attempting to help another to commit an act of academic misconduct.

"Academic sanction" means a sanction imposed on a student for engaging in academic or professional misconduct. It may include, but is not limited to, requiring a student to retake an exam(s) or rewrite a paper(s), a grade reduction, a failing grade, probation, suspension or dismissal from a program or the University, or revocation of a student's degree or certificate. It may also include community service, a written reprimand, and/or a written statement of misconduct that can be put into an appropriate record maintained for purposes of the profession or discipline for which the student is preparing.

Students have the right to appeal an academic sanction. The Code of Student Rights and Responsibilities documents the appeal process.

**Contact Information**

For questions regarding this handbook, please contact:

**PMST Program Director**

Dr. Ray Hoobler, at 801-585-5630

**PMST Project Coordinator**

Mr. Derek Payne, at 801-585-3650,

or contact your respective track director:

***Biotechnology***

Dr. Jennifer Shumaker-Parry: [shumaker@chem.utah.edu](mailto:shumaker@chem.utah.edu)

***Computational and Data Science***

Dr. Elena Cherkaev: [elena@math.utah.edu](mailto:elena@math.utah.edu)

***Earth Resource Management***

Dr. Mike Nelson: [Mike.Nelson@utah.edu](mailto:Mike.Nelson@utah.edu)

***Environmental Science***

Dr. Thomas Cova: [cova@geog.utah.edu](mailto:cova@geog.utah.edu)

***Science Instrumentation***

Dr. Clayton Williams: [clayton@physics.utah.edu](mailto:clayton@physics.utah.edu)

## **TIME LIMIT**

All work for the master's degree must be completed within four consecutive calendar years. On recommendation of the student's supervisory committee, the Dean of The Graduate School can modify this requirement. If the student exceeds the time limit and is not granted a modification or waiver, the PMST Executive Committee has the option to discontinue the student. Students whose studies have been interrupted for long periods of time and who have been granted extended time to complete their degrees may be required to complete additional courses, to pass examinations, or otherwise to demonstrate that they are current in their field.

## **SUPERVISORY COMMITTEE**

Full-time students should form their Supervisory Committee during the second semester of their first year of study; part-time students during the first semester of their second year of study. The Supervisory Committee must be in place prior to beginning the Professional Experience Project. The Supervisory Committee approves the student's Academic Plan, provides input on the student's Professional Experience proposal, attends the proposal presentation, evaluates the written report, attends project review meetings, attends the final presentation and assigns a grade to the Professional Experience project.

The Supervisory Committee consists of three faculty members with the majority being tenure-line faculty at The University of Utah. All University of Utah faculty members (tenure-line, career-line, adjunct, visiting and emeritus) are eligible to serve as members of the Supervisory Committee. The faculty member must hold an academic or professional doctorate, the terminal degree in their field, or have demonstrated expertise relevant to the student's project. A tenure-line faculty member serves as Chair of the Supervisory Committee.

Non-University of Utah faculty can serve as a member of a Supervisory Committee. The student sends a formal request (this can be done using email) to the PMST Program Director and must include a Curriculum Vitae of the proposed member and justification. If approved, the Program Director will make an official recommendation to the Dean of The Graduate School, who makes the final decision to allow the Non-University faculty to sit on the Supervisory Committee.

It is the responsibility of the student to approach prospective committee members to determine their willingness and availability to serve in such a capacity. Faculty members have the right to refuse to sit on a student's supervisory committee for justifiable academic reasons.

Exceptions to these guidelines must be recommended and justified by the PMST Program Director and approved by the Dean of The Graduate School.



## PROFESSIONAL EXPERIENCE

A crucial part of the PMST Program degree requirements is the development and completion of a Professional Experience Project. The expectation is that students do more than merely serve as an intern. A project is “a temporary endeavor undertaken to produce a unique product, service or result.” (PMI Guide to PMBOK®, 2000) The PMST program requires that graduate students plan and execute a project with a sponsor external to the university setting, usually a local industry partner, government agency, or non-profit organization. The process includes:

- Identifying a project relevant to the sponsor and meeting the University’s requirements for a master’s project;
- Working with the sponsor in proposing a solution;
- Implementation of the project;
- Evaluating the effectiveness of the solution.

Our goal is for students to complete their project during a single semester. To meet this goal, students need to plan their projects (and have the project approved by the program director, track director, and supervisory committee) in the preceding semester.

The project scope will vary from project to project; however, most projects require a time commitment of 12-18 hours per week. This weekly time commitment translates into 180 — 270 hours for a 15-week semester. The project must include a science (or STEM) and transferable skills (business) component related to their program of study. Students enroll in MST 6975 to receive credit for their project.

A template for the final report with information on content is available on the PMST Canvas site.

### Prerequisites

Prior to starting the Professional Experience Project, students must complete a minimum of 18-Credit hours based on the following: MST 6010, MST 6012, MST 6020, MST 6021, MST 6022, MST 6023, MST 6500, MST 6600, plus 6 additional credits, OR a minimum of 18-credit hours based on three of four classes from the transferable skills sequence: MST 6100, MST 6110, MST, 6200, MST 6210; MST 6600, plus 3- to 6-credits from core or elective course work.

### Professional Experience Opportunity

Graduate students are responsible for identifying a sponsoring organization or company and developing a suitable project with a supervisor of the organization or company. Students are encouraged to seek out and explore Professional Experience opportunities as soon as possible after entering the PMST Program.

### Supervisory Committee

Graduate students are responsible for assembling their supervisory committee and submitting the *Supervisory Committee Information Form* to the Project Coordinator.

Many members of the University faculty are familiar with the PMST project requirements; however, the following three documents can be provided to members of the supervisory committee if they are unfamiliar with PMST program project requirements:

1. Supervisory Committee Guidelines
2. Professional Experience Proposal Objectives and Summary Guidelines
3. Professional Experience Proposal Guidelines

These forms are available on the PMST Program Canvas site and as Appendices in this handbook.

### *Written Professional Experience Proposal*

Graduate students should carefully review the Professional Experience Proposal Guidelines. The written Professional Experience Proposal should include both a science and business component.

**Prior to writing the full proposal, a one-page Professional Experience Pre-Proposal stating the Project Objectives and Project Description will be submitted to the Program Director and the Track Director for review and approval.** Additional information is available on the PMST Canvas page. The pre-proposal should be submitted the semester prior to starting the project. Upon approval of the Professional Experience Pre-Proposal, graduate students proceed to form their supervisory committee and write their formal proposal.

Students are encouraged to seek input from the PMST Project Coordinator, Program Director, and Track Director; however, the written Professional Experience Proposal is submitted to the Supervisory Committee for approval. This document should be submitted approximately 3 weeks prior to the beginning of the project to allow sufficient time for review. A well written proposal that follows the program guidelines can be approved in a shorter timeframe.

Final versions of the proposal and summary documents are submitted to your supervisory committee **at least one week prior to your Professional Experience Proposal Presentation.**

### *Professional Experience Proposal Presentation*

Graduate students will coordinate a meeting time to present the proposal to the student's Supervisory Committee. Students should also invite the Science Track Director, Program Director and Project Coordinator to the proposal meeting. Required attendees are the Supervisory Committee, and either the Track Director, Program Director or Program Coordinator, who serve as facilitators.

The Professional Experience Project Proposal and Presentation process is outlined in figures 2 through 4.

The *Professional Experience Proposal Approval Form* with the Professional Experience supervisor's signature is approved at the end of the Professional Experience Project proposal presentation and then submitted to the Project Coordinator. If the project is presented remotely, the committee will verbally approve the project and the Program Director or Project Coordinator will note the approval.

## Professional Experience Project

### Step 1a: Pre-proposal and Proposal Document

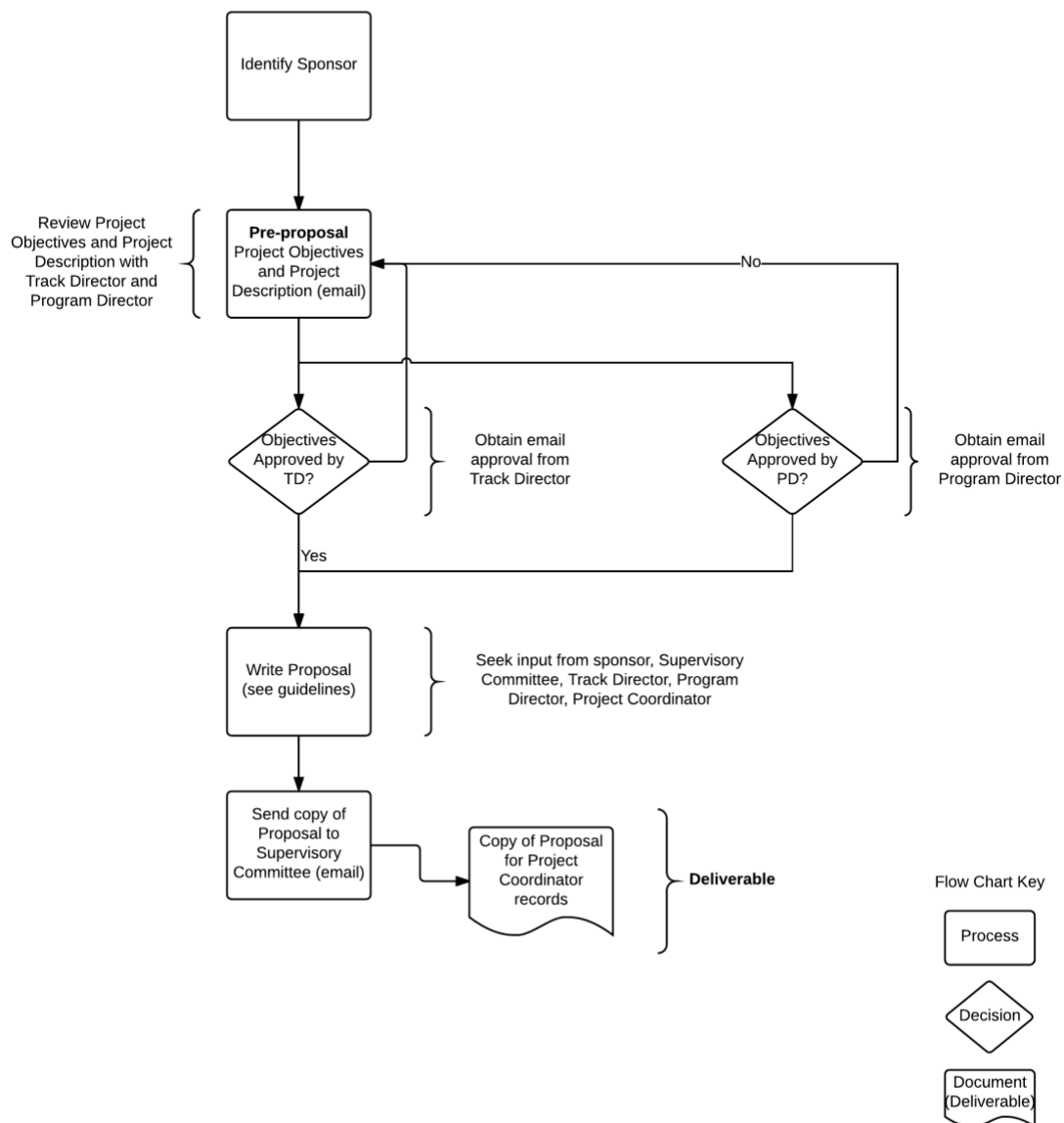
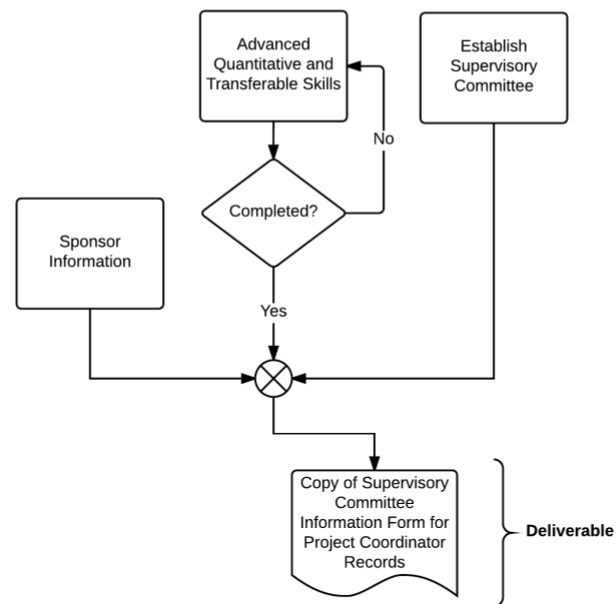


Figure 2. Professional Experience Project Proposal and Presentation flow chart. Step 1a is to identify a sponsor and have the Proposal Objectives and Project Description approved, and to write the proposal.

## Professional Experience Project Step 1b: Establish Supervisory Committee



### Flow Chart Key



Figure 3. Professional Experience Proposal and Presentation process flow chart. Step 1b is to identify a sponsor and members to serve on the Supervisory Committee.

## Professional Experience Project Step 2: Presentation and Approval

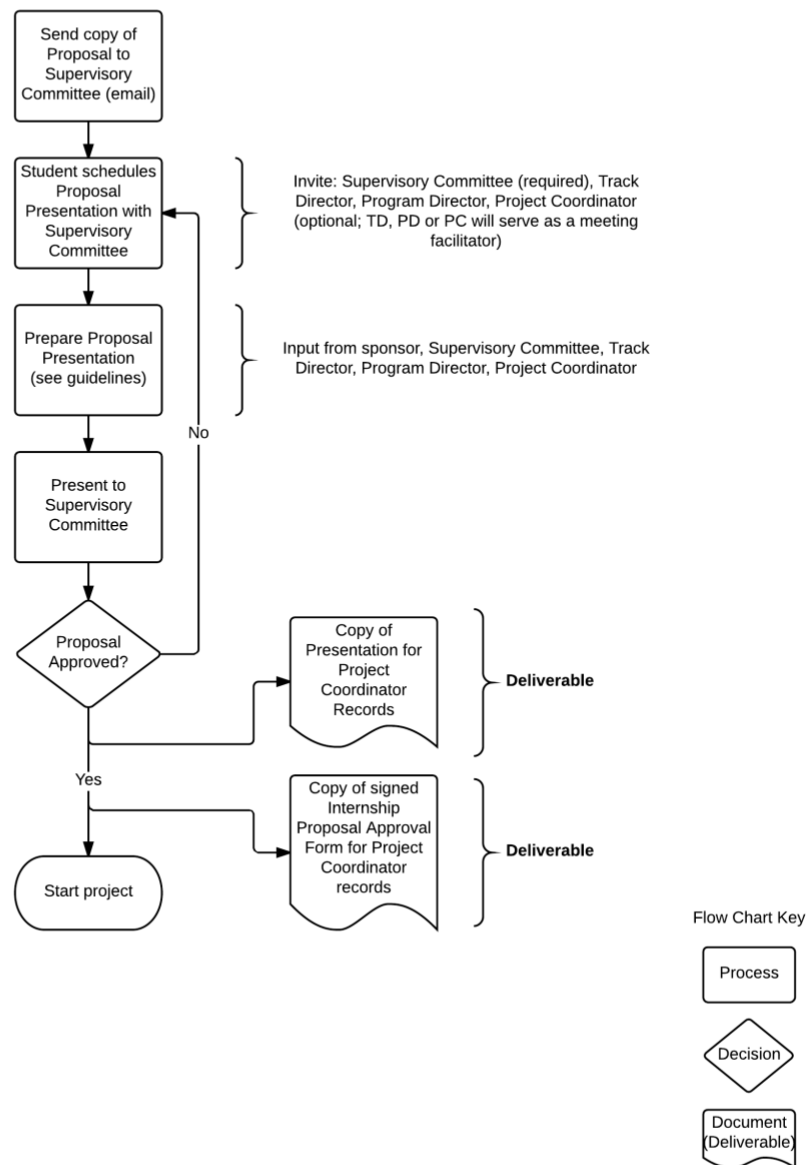


Figure 4. Professional Experience Proposal and Presentation flow chart. Step 2 is to prepare and present the proposal to the Supervisory Committee.

Each process in the Professional Experience Proposal and Presentation process flow diagrams are represented as a “box.” Brief descriptions are provided below:

- **Advanced Quantitative and Transferable Skills:** Graduate students must complete the MST Transferable Skills and Advanced Quantitative Skills courses prior to starting their Professional Experience Project.
- **Identify Sponsor:** Graduate students are responsible for identifying a sponsor. The Track Director and Program Director can provide guidance if needed.
- **Establish Supervisory Committee:** Graduate students assemble their Supervisory Committee following Graduate School guidelines which are included as part of this Handbook.
  - ***Supervisory Committee Information Form:*** This is a deliverable that documents the members of the Supervisory Committee. The committee reviews the Project Proposal and grades the final Project Report and Presentation.
- **Pre-Proposal (Project Objectives and Project Description) (email):** Project Objectives must be approved by the Program Director and the Track Director.
- **Write Proposal:** The Professional Experience Project Proposal is written prior to starting the Professional Experience. Graduate students should seek input from the Organization or Company Sponsor, Track Director, Program Director and/or Project Coordinator. The Professional Experience Proposal should be reviewed with members of your Supervisory Committee prior to the presentation. This can be done via email, one-on-one meetings, or a formal review meeting with the committee.
  - ***Proposal:*** This document is a deliverable; a copy of the Project Proposal is submitted to the Project Coordinator.
- **Send a copy of your proposal to members of your Supervisory Committee (email)**
- **Schedule Proposal Presentation with Supervisory Committee:** In addition to the Supervisory Committee, invite your Track Director, the Program Director and the Project Coordinator.
- **Prepare Proposal Presentation**
  - **Present Proposal Presentation to Supervisory Committee**
  - ***Proposal Presentation:*** This document is a deliverable; a copy of the Proposal Presentation is submitted to the Project Coordinator.
  - ***Professional Experience Proposal Approval Form:*** This document is a deliverable; a signed copy of the Professional Experience Proposal Approval Form is submitted to the Project Coordinator.

The Graduate Student can start their Professional Experience after the above steps are completed.

Note, the following documents are **DELIVERABLES**:

- *Supervisory Committee Information Form*
- *Professional Experience (Internship) Proposal*
- *Professional Experience (Internship) Presentation*
- *Professional Experience (Internship) Proposal Approval Form*



### Professional Experience Project

The Professional Experience Proposal must include a schedule for updates to the Supervisory Committee.

Contact your committee as soon as possible to clarify new expectations that will enable you to fulfill the program academic requirements if a Professional Experience requirement, deliverable or expectation for the project unexpectedly cannot be met as anticipated.

### Final Report

Graduate students submit a final report based on their Professional Experience Project. Creating a well written document is not trivial; the University and Graduate School provides a number of recourses to students including the Writing Center (Marriot Library) and a subscription to Grammarly. Most faculty prefer to review document in Microsoft Word. The report should be reviewed with the Supervisory Committee Chair, Program Coordinator, and Program Director prior to submitting it to the Supervisory Committee **one month before the scheduled presentation**. It is expected that students provide a working copy of the final report to the Supervisory Committee chair **two weeks before** the scheduled presentation. Ideally, graduate students will provide a final report for review that only needs minor edits.

After review of the final report with the Supervisory Committee Chair, the graduate student will schedule and present the Professional Experience Final Report Presentation to the Supervisory Committee. In addition to the Supervisory Committee, the Program Director (who serves as the Director of Graduate Studies) is required to attend. The Science Track Director should be invited.

Graduate students submit the final version of the Professional Experience Report to the Supervisory Committee, Track Director, Project Coordinator and Program Director **at least 1 week before the final presentation**.

### Final Presentation

Confirm the date, time and location of the Final Presentation with the Supervisory Committee, Program Director, and Project Coordinator.

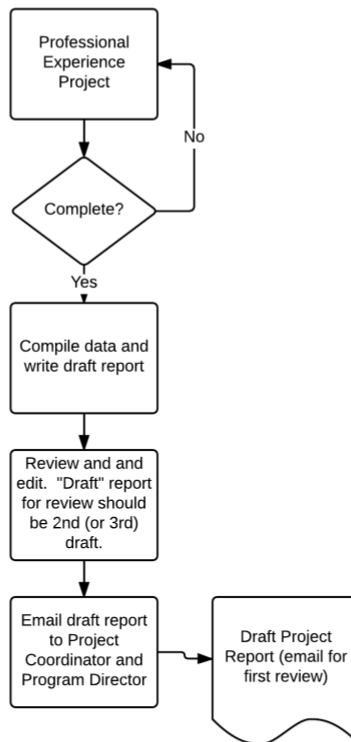
Fill out the *Announcement/Abstract* Form (available on the PMST Program Canvas site and as an Appendix in this document) and submit the form to the Project Coordinator one week before your final presentation. **Note: The final presentation is open to the public.**

Submit a hard copy of your final report to the Project Coordinator. **Note: The final report is considered a public document.**

\* Additional general information regarding assembling a supervisory committee can be found at the following Graduate School URL: <http://gradschool.utah.edu/graduate-catalog/degree-requirements/>.

The Professional Experience Report and Presentation process is shown in figures 5 through 7.

## Professional Experience Report and Presentation Step 1: Draft Report

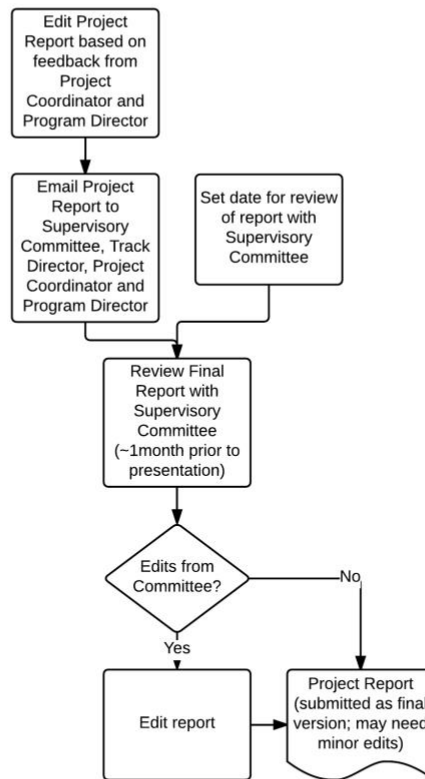


### Flow Chart Key



Figure 5. Professional Experience Report and Presentation flow chart. Step 1 is a draft report for review by PMST program staff.

## Professional Experience Report and Presentation Step 2: Supervisory Committee Review of Project Report



### Flow Chart Key

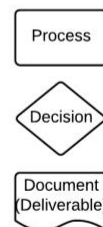


Figure 6. Professional Experience Report and Presentation flow chart. Step 2 is to review the final report with the Supervisory Committee approximately one month prior to the final presentation.

## Professional Experience Report and Presentation Step 3: Project Presentation

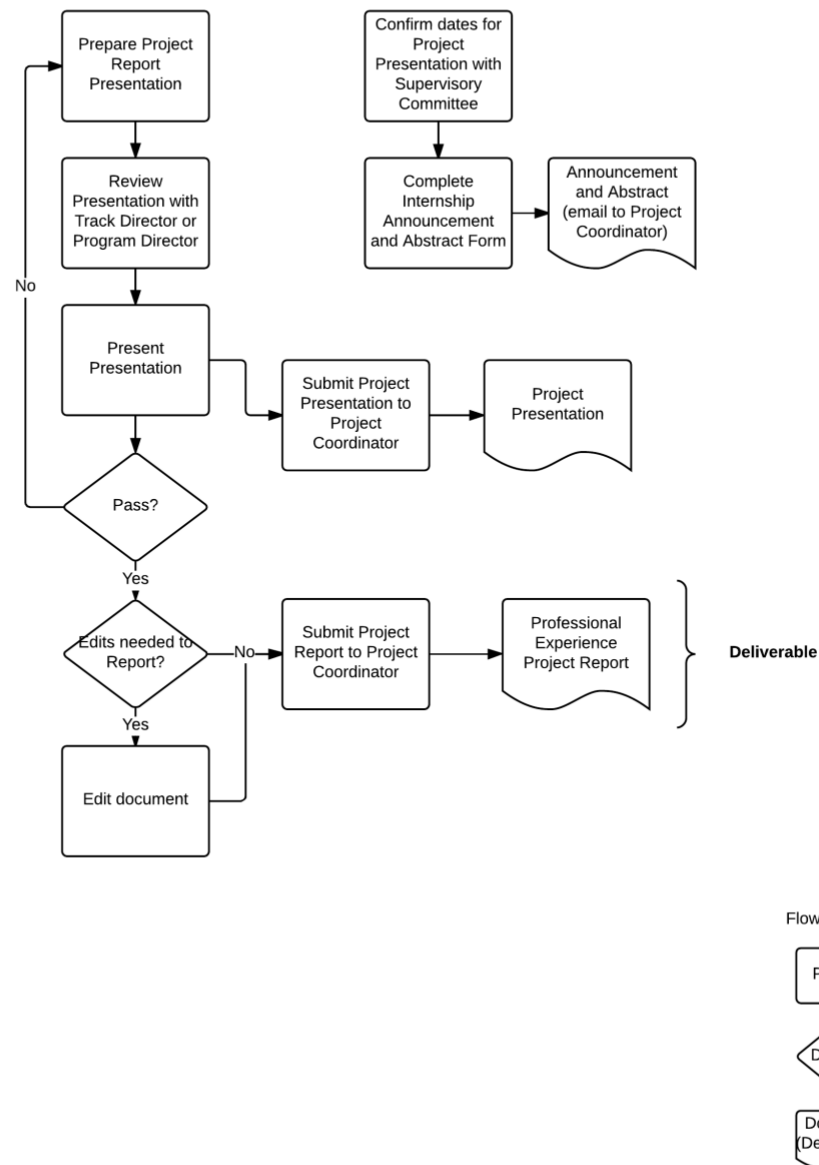


Figure 7. Professional Experience Proposal and Presentation flow chart. Step 3 is to present the report to the Supervisory Committee and submit the final report to the PMST Project Coordinator.

Note, the following documents are **DELIVERABLES**:

- *Announcement and Abstract Form*
- *Professional Experience Presentation*
- *Professional Experience Report*

## GRADUATION

Students complete the Application for Graduation the Semester before graduating; important dates are published online. A flow chart is provided in Figure 8.

### Graduation Flow Chart

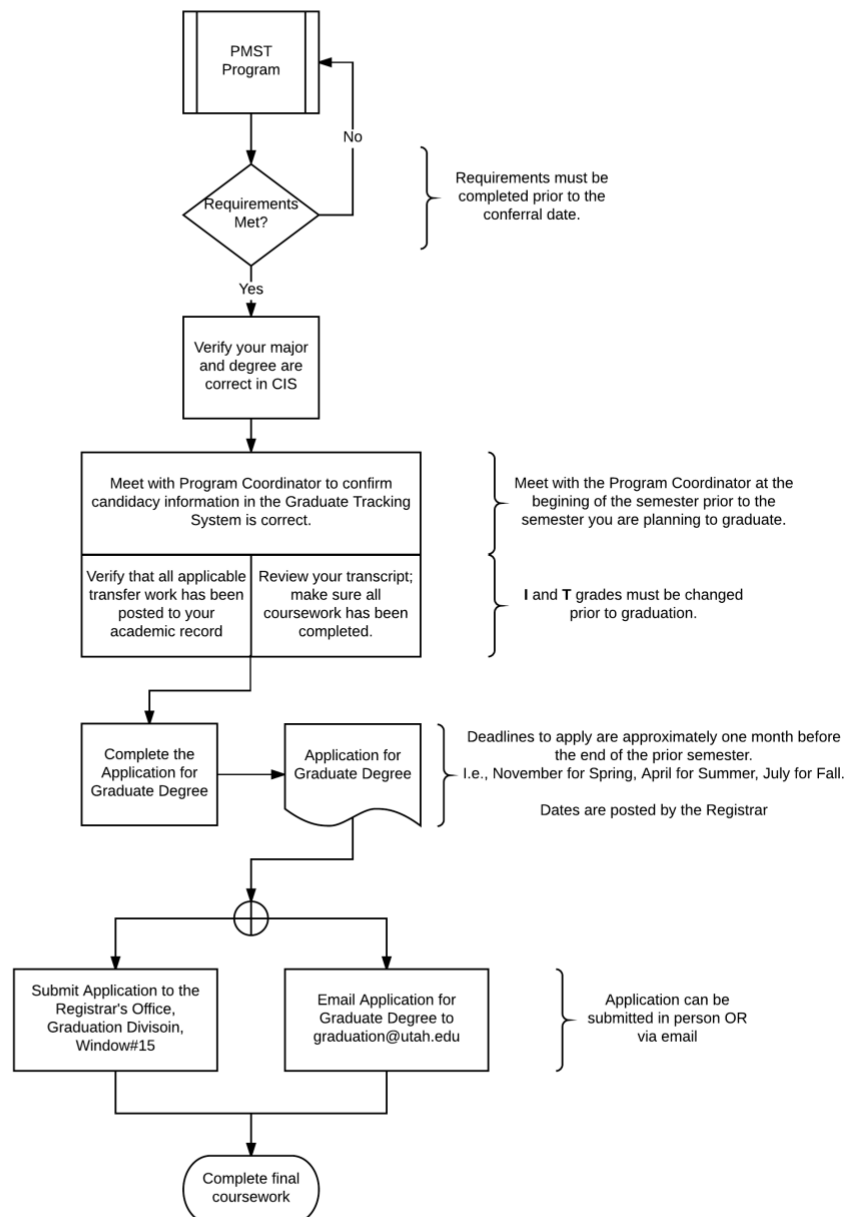


Figure 8. Flow chart showing the Application for Graduation process.

## ADDITIONAL PROGRAM REQUIREMENTS

### PROFESSIONAL EXPERIENCE REPORT

Students submit a final copy of the Professional Experience Report to the Project Coordinator. The Professional Experience Report is a public document.

### EMAIL

Formal correspondence with the University of Utah (The Professional Master of Science and Technology program, The Graduate School, Faculty, etc.) should be conducted using your U-mail account. Routine correspondence can be conducted through the Canvas Inbox.

### EVENTS AND CALENDAR INVITATIONS

PMST events that require planning will be scheduled using The University of Utah's Umail calendar. Students should accept or decline these invitations based on their availability. They should update their status if their schedule changes. Use of "tentative" is discouraged as it does not provide accurate information to the event planner.

### CANVAS

The PMST program maintains a CANVAS website and students in the program are expected to access this site. The site is used for:

- Uploading required documents
- Sharing files related to the program
- Making announcements

#### Sharing Files

Files are organized into folders; active folders such as the PMST Handbook are updated regularly, while other folders are used to archive information. You should consult the program staff if you have specific questions or need assistance finding specific information.

#### Announcements

The Canvas site provides a convenient, direct method for program staff to communicate with students. Announcements include, but are not limited to:

- Upcoming Seminars
- Program deadlines or other important dates
- Career Fairs
- Job and Professional Experience postings from potential employers and sponsors

## APPENDICES



## **SUPERVISORY COMMITTEE GUIDELINES**

If needed, the following two pages can be printed out and reviewed with members of the Supervisory Committee.

*Supervisory Committee Guidelines for the Professional Master of Science and Technology Program*

Thank you for serving as a supervisory committee member for our student.

The supervisory committee works with the student to:

- Establish Professional Experience expectations at the proposal stage
- Approve the Professional Experience proposal
- Offer guidance or feedback to the student during the Professional Experience
- Provide feedback and input on the final report
- Approve the final report and readiness for the student's Professional Experience presentation
- Attend the final presentation
- Assign a grade to the Professional Experience project and submit the grade to the Program Director

Students in the PMST program take approximately the same number of graduate-level science and mathematics courses as traditional Master of Science programs require; however, instead of a research requirement, PMST students take courses in professional domains and complete a Professional Experience that provides practical, hands-on training and a meaningful work experience which includes science, technical and business content. Students demonstrate their business (i.e., communication, management, decision-making and leadership), science and technical skills within their Professional Experience project.

Your role in the supervisory committee is invaluable for our students. It provides students with a foundation from which they can seek counsel and expert feedback, which enriches their academic experience. For more information about our program, please visit our website at [pmst.utah.edu](http://pmst.utah.edu).

Sincerely yours,

Ray J. Hoobler, Ph.D.

Director, Professional Master of Science and Technology

(801) 585-5630

[ray.hoobler@utah.edu](mailto:ray.hoobler@utah.edu)

*Student Professional Experience Project Expectations*

Students are expected to:

Obtain approval from the Track Director and the Supervisory Committee before beginning the Professional Experience Project and provide the Supervisory Committee members with the following documents:

1. Supervisory Committee Guidelines
2. Professional Experience Project Proposal Guidelines
3. PMST Professional Experience Proposal

Additionally, PMST Graduate Students are expected to:

- Follow through on the project expectations outlined within the proposal
- Restate expectations/requirements set at the time of the proposal presentation in an email to the Supervisory Committee
- Communicate with the Supervisory Committee if a requirement, expectation and/or deliverable cannot be met, to enable the Supervisory Committee and the student to devise a modification to the original plan to fulfill the project objectives
- Schedule the required meeting with the Supervisory Committee one month prior to the final presentation to discuss the content of the final report/presentation
- Submit a working copy of the final report to the committee at least three weeks before the scheduled presentation to provide time for the committee to review and comment
- Submit a final version of the final report to the committee at least one week before the final presentation to provide enough time for the committee to review the report

*Professional Experience Project*

The Professional Experience process follows a “phase gate” process:

Phase 1: Identify the sponsor and project

Milestone: Pre-proposal approval

Phase 2: Project proposal and proposal presentation

Milestone: Proposal approval by Supervisory Committee

Phase 3: Project

Phase 4: Project report and presentation

Milestone: Supervisory Committee agrees the project is complete; Project report approved; Final grade assigned.

The Supervisory Committee assigns the final grade at the end of the Professional Experience Project after receiving the final version of the project report.

**PRE-PROPOSAL: PROPOSAL OBJECTIVES AND PROJECT DESCRIPTION GUIDELINES**

*Prior to writing the full proposal, a one-page Professional Experience Pre-Proposal stating the Project Objectives and Project Description will be submitted to the Program Director and the Track Director for review and approval. Additional information is available on the PMST Canvas page*

Use the S.M.A.R.T method to define your project objectives.

• Specific:	Explicit, clear, understandable
• Measurable:	Quantifiable (business metrics, quantity, quality, cost, or time)
• Attainable:	Reachable, within capabilities
• Relevant:	Important to the organization and program
• Time-bound:	Specific time period

(Project Management Fundamentals, International Institute for Learning, Inc., 2009, p. 4-21)

The SMART method provides a simple framework for stating the Project Objectives. Objectives must relate to the science or business components of the project. Both a science and business component are required for the project.

Example 1 (not SMART): Project aims to develop a robust in-house method for analyzing nutritional supplements.

Example 2a (SMART): Develop an in-house method for analyzing amino acid levels in nutritional supplements using reverse phase, ultra-high-performance liquid chromatography in 10 weeks.

Example 2b (SMART): Prepare a “cost-of-analysis” report that compares the cost of in-house testing versus the current cost using external laboratories. This report will be a deliverable of the project (10 weeks).

**TITLE: Provide a descriptive title for your project****Project Objectives**

- The first objective should be a **STEM-based component** of the proposed project. Using the SMART framework is helpful in writing clear, meaningful objectives.
- The second objective should be a **non-STEM-based component** of the proposed project. This is often a "business" deliverable but can be related any topic covered as part of the Transferable Skills curriculum.
- There is no limit to the number of objectives; however, project proposals must have the two objectives above.

**Project Description**

The Project Description is a short narrative where you provide additional details about the project. These include:

1. Identifying the problem and making it clear why it is important.
2. Providing a brief summary of the project including the resources needed.
3. Include a brief summary of the organization you will be working with and the name, title, and contact information (phone number and email address) of the organization's project sponsor.
4. List the deliverables for both the
  - Sponsoring organization
  - Supervisory Committee (These deliverables may or may not overlap.)
5. Indicate whether or not the proposed project will take place at your current place of employment and, if so, how it will differ from your current responsibilities.
6. Estimated dates for the project (e.g., fall semester 2023; starting mid-summer 2023, finishing fall semester 2024, etc.)

## PROFESSIONAL EXPERIENCE PROPOSAL GUIDELINES

Information below is provided as a general guide. A specific format is not required; however, a template is available upon request. The proposal should include:

### Project Objectives

Use the S.M.A.R.T method to define your project objectives.

- Specific
- Measurable
- Attainable
- Relevant
- Time-bound

Objectives must relate to the science and/or business components of the project. Both a science and business component are required for the project.

### Introduction

Identify the larger problem and make it clear why it is important. The introduction should be written to engage a wide audience. Include a brief summary of the organization you will be working with.

(Note: The first part of the written proposal is based on the proposal objectives and summary discussed in the previous section.)

### Detailed Project Description

Provide a detailed description of your project and your specific challenges. Clearly state what will be the important results from your work.

### Project Plan

A good proposal will include a detailed project plan. The plan should include:

- Objectives – the desired outcome of the efforts and aligned with project objectives.
- Requirements – specific attributes of the deliverables that will satisfy the objectives.
- Deliverables – the project deliverable is the Professional Experience Report; interim deliverables are the outcomes of tasks and activities within the project.
- Project schedule – define the major milestones, duration of work efforts, start and end dates for every work component. Project schedules can be represented using Gantt charts. (See examples on the following page.)
- Milestones – events or points in time when a deliverable or set of deliverables is available; completion of a phase.

The baseline plan will be used as the reference point for project execution.

### References

Provide the list of references used to develop your proposal. Use a format consistent with your discipline.

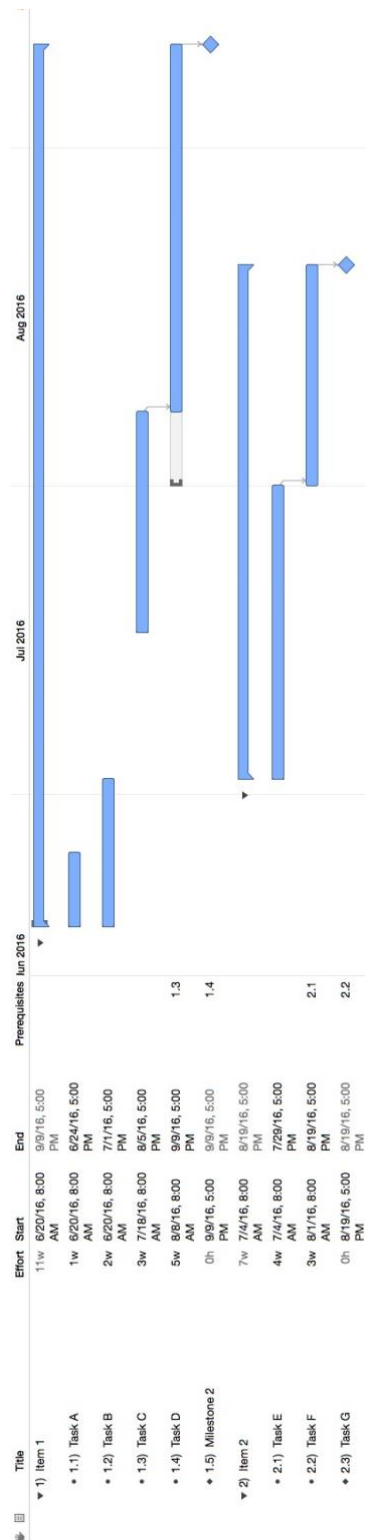


Figure 9. Project schedule generated using a commercial SW package (OmniPlan 3 for Mac)



Task	Dependency?	Start	End	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35
1 Task1		20-Jun	24-Jun											
2 Task2		20-Jun	1-Jul											
3 Task3		28-Jul	30-Jul											
4 Task4	3	1-Aug	27-Aug											
5 Task5	2	4-Jul	9-Jul											
6 Milestone1			16-Jul											
7 Task7		4-Jul	30-Jul											
8 Task8	7	1-Aug	20-Aug											
9 Milestone2			27-Aug											

Figure 10. Project schedule generated using MS Excel.

## PROFESSIONAL EXPERIENCE REPORT GUIDELINES

Information below is provided as a general guide. A specific format is not required; however, a template is provided on the PMST Canvas web site. The report should include:

### Executive Summary

The executive summary captures the essence of the entire project in one or two pages.

### I. Introduction

Identify the larger problem and make it clear why it is important. The introduction should be written to engage a wide audience.

The introduction should include information on past work or references used to guide the project.

Include a brief summary of the organization you will be working with.

#### *Project Objectives*

Restate the project objectives based on your original proposal. Identify any changes to the project objectives that occurred during the Professional Experience. The objectives must relate to the science and/or business components of the project. Both a science and business component are required for the project.

#### *Project Description*

Describe the specific challenges you worked on during your Professional Experience.

### II. Methods

Describe the methods used.

### III. Results

Report the important results from your work.

### IV. Conclusions

What did you learn? What were you able to change or implement as a result of your Professional Experience?

### References

Provide the list of references used in your report. Use a format consistent with your discipline.

### Appendix

Large data sets or complex figures and tables that interrupt the flow of a report should be put in an Appendix at the end of the report.

## PROFESSIONAL EXPERIENCE PRESENTATION GUIDELINES

Presentations should, generally, NOT follow the flow of an academic paper (Introduction, Methods and Materials, Results, Conclusions), as they are not intended to be “stand alone” documents.

Presentation structure discussed in “Strategic Storytelling: How to Create Persuasive Business Presentations” by Dave McKinsey (CreateSpace Independent Publishing Platform, North Charleston, 2014) follows:

- Situation
- Complication
- Resolution

The method discussed is concise and follows the presentation flow common in business meetings where data is being reviewed.

An excellent text on slide design and data presentation is “Slide:ology: The Art and Science of Creating Great Presentations” by Nancy Duarte (O’Reilly, Sebastopol, 2008, Ch. 4).

Both texts emphasize the benefits of outlining or “storyboarding” and these techniques provide a framework to build effective presentations.

Finally, give yourself enough time to develop the presentation. Effective presentations require time. A time estimate from Duarte (p. 13) includes:

- |                                 |           |
|---------------------------------|-----------|
| • Organize the ideas/material:  | 1 hour    |
| • Outline and/or storyboard:    | 2 hours   |
| • Build the slides:             | 20+ hours |
| • Rehearse, rehearse, rehearse: | 3+ hours  |

While the total is less than 30 hours, it shouldn’t be completed in one or two sittings.

A PowerPoint template is provided on the PMST Canvas web site.

**IMPORTANT FORMS**

The following forms are provided below and can be printed as needed:

- Supervisory Committee Information Form
- Request to Change Supervisory Committee Form
- Professional Experience (Internship) Proposal Approval Form

Supervisory Committee Information Form**Student Information**

Student Name	Student ID number
Track (check one) <input type="checkbox"/> Biotechnology <input type="checkbox"/> Computational and Data Science <input type="checkbox"/> Earth Resource Management	<input type="checkbox"/> Environmental Sciences <input type="checkbox"/> Scientific Instrumentation

**Supervisory Committee Members (Name, Department, email address, phone number)****Chair**

Name:

Department:

Tenure status (check one): ☐ Tenure line; ☐ Career line; ☐ Other

Email:

Phone number:

**Member**

Name:

Department:

Tenure status (check one): ☐ Tenure line; ☐ Career line; ☐ Other

Email:

Phone number:

**Member**

Name:

Department:

Tenure status (check one): ☐ Tenure line; ☐ Career line; ☐ Other

Email:

Phone number:

**Approvals:**

Supervisory Committee Chair:

Program Director or Director of Graduate Studies:

**Request to Change Supervisory Committee Form**

Note: This form should only be used when requesting a change to a Supervisory Committee and not when initially organizing a committee.

**Student Information**

Student Name	Student ID number
Track (check one) <input type="checkbox"/> Biotechnology <input type="checkbox"/> Computational and Data Science <input type="checkbox"/> Earth Resource Management	<input type="checkbox"/> Environmental Sciences <input type="checkbox"/> Scientific Instrumentation

**Current Supervisory Committee Members**

<input type="checkbox"/> Chair	
<input type="checkbox"/> Member	<input type="checkbox"/> Member
Indicate with a check which member is being removed.	

**Proposed Supervisory Committee Members**

<input type="checkbox"/> Chair	
<input type="checkbox"/> Member	<input type="checkbox"/> Member
Indicate with a check which member is being added. Committee members being added must sign this form.	

**Justification for change (100 words):**

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**Approvals:**

Supervisory Committee Chair:
Science Track Director:
Program Director or Director of Graduate Studies:

Professional Experience (Internship) Proposal Approval Form

Submitted by (Print first, last name)
---------------------------------------

Track (check one)

☐ Biotechnology☐ Computational and Data Science☐ Earth Resource Management☐ Environmental Sciences☐ Scientific Instrumentation***This Professional Experience Proposal has been read and has been found to be satisfactory by:*****Project Supervisor**

Print Name	Signature
Department:	Date:

**Supervisory Committee Members**

Chair, Print Name	Signature
Department:	Date:

Member, Print Name	Signature
Department:	Date:

Member, Print Name	Signature
Department	Date

**Program Director or Director of Graduate Studies**

Print Name	Signature
Department	Date

Ray J. Hoobler, Ph.D. Program Director (801) 585-5630 Building 44, Room 223 Ray.Hoobler@utah.edu	Derek Payne Project Coordinator (801) 585-3650 Building 44, Room 224 Derek.Payne@gradschool.utah.edu
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## **PRESENTATION ANNOUNCEMENT/ABSTRACT**

Students submit the following information to the Program Coordinator:

**Title**

Name

Date and Time

Location

One to two paragraph abstract summarizing the Professional Experience (Internship). This information will be posted to Canvas as an Announcement.