

## **MSEN / MEPH Graduate Program Research Document Guidance**

This document will be used to define the area of research for each MSEN/MEPH student at the end of the first semester of working with their research professor and for updates each semester thereafter. The student's initial research description Word document will be named:

<lastname> <degree> Doc Rev <0>.doc (to be converted to .PDF and electronically signed prior to MSEN Program submittal)

where <lastname> is the student's last name and <degree> is either MS or PhD and <0> is the revision number. The student must secure electronic signatures of all personnel listed on this document once the draft is approved by their advisor(s) and MSEN/MEPH associate director, then submit the electronic file with electronic signatures to the MSEN/MEPH program office.

Each student will revise their research description document at the end of each semester to record progress made during the semester. The updated document will be saved as the next higher revision number. If there are no significant changes to the scope of the research investigation contained in the document AND no change in advisor(s), only the student, MSEN/MEPH associate director and advisor(s) signatures will be required when the electronic file with electronic signatures are delivered to the MSEN program office via email.

This Rev 0 document will be accompanied by a Microsoft Project printout and file giving the current status of all research actions needed by the student, advisor(s), and support personnel. This Project file will define the actions required to complete a MS research thesis within two academic years or a Ph.D. research dissertation within three years. This file will be named:

<lastname> <degree> Proj Rev <0>.ppt

Details of the Project file composition and update schedule are contained in a separate descriptive document.

**Student Information Fields:** Complete the fields at the top of the first page.

**Background of research topic area:** This will give the reader an understanding of the current state of understanding of the arena in which the research will be conducted. It is meant to be a brief overview rather than an exhaustive description. One or two highly relevant references could be appropriate.

**Descriptive overview of research to be performed:** This will give the reader an abstract level review of the proposed research investigation. Some diagrams may be appropriate if it aids in understanding the proposed research investigation. All input variables should be defined, as well as a clear description of the output measurables of the experiments or investigation. This section

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should also clearly state in what fashion the student's research will create new intellectual property in the field of study.

**Motivating Rational (review: [https://www.nsf.gov/pubs/policydocs/pappg19\\_1/nsf19\\_1.pdf](https://www.nsf.gov/pubs/policydocs/pappg19_1/nsf19_1.pdf))**

- 1) Intellectual Merit of your Research**
- 2) Broader Societal Impacts of your Research**

**Quantification of proposed research boundaries (currently planned experimental space, including range of planned input variables and expected range of measured output):**

Critical planning elements of any initial experiment or investigation is the determination of the range of input variation and the anticipated range of the output measurables of the investigation. While the investigative space may evolve during the course of the investigation and may result in a revision of this document, a clear understanding of the initial expectations of the investigation is critical both for proper equipment selection and as a baseline for judging early investigative results.

**Listing of high-risk components of research effort:** The purpose of this section is to capture logistical elements of the planned research that may interfere with the creation of the new intellectual property. For instance, if the research is dependent on the use of a piece of equipment that will not be available until completion of another experiment, then that would be a high-risk logistical element. If the research investigation depends on the purchase of items using funds from a grant not yet approved, that would be a high-risk logistical element.

It is clearly not the intention of this document to identify the expected results of this research investigation to be identified as a high-risk logistical element. All research is by definition work with no guarantee of reaching the expected results. In the research Project File, these high-risk logistical elements will be identified as critical path elements.

**Alternative research topic/output should some high-risk element cause a significant time delay to completion schedule:** As noted before, research investigations by their very nature are unpredictable and often require significant modifications in methodology during the course of the investigation. This section should identify an alternative (but related) research investigation that utilizes lower risk logistical support should the original research high-risk logistics become insurmountable.

It should be noted that a research investigation may be 100% successfully executed but result in results that are at odds to the original output measurable expectation (even to the point of showing no output measurable change as a function of input variation). If the research methodology is reviewed in such a case and found to be valid, then the "lack of a result" can be viewed as an interesting result in itself and can be the basis for the research element of a MSEN/MEPH graduate degree.

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**Journal/Meeting(s) targeted for publication:** While not every MS level research investigation will result in a publication or presentation at a professional meeting, such outcomes are beneficial to the student and the MSEN / MEPH program. Each MS student should identify at least one possible venue for public presentation of their research investigation in the rev 0 document.

Ph.D. level research is expected to be presented at an appropriate professional meeting for peer review and feedback, and publication of the results is also expected.

**Progress made toward completion of research investigation:** This section should follow a narrative format, with a new subsection being added to the research document with each revision. The format should begin with such wording as, “During the period of m1/d1/y1 to m2/d2/y2 (described in revision N of this document), the significant events affecting this research were....”.

**This section should also include a concise statement of project tasks with a timeline that shows planned progress vs. actual progress (see example slide)**

**Signature page:** A full signature set is only required on the revision 0 document and on end of semester revisions that contain significant change in scope of the research investigation OR a change in advisor(s). All other revisions require only the student, MSEN associate director and advisor(s) signatures before delivering an electronic file and digitally signed softcopy to the MSEN program office.