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Purpose

The purpose of this document is to define policies and procedures for administering the Ph.D. program within the Department of Electrical and Computer Engineering (ENG). All Ph.D. students and faculty advisors must be familiar with the policy and instructions set forth in this handbook and those identified in the Doctoral Committee Policy Letter. The department has administrative control of the Ph.D. program, but policy and procedures are also defined at higher levels. Other applicable documents are:

- ENOI 36-114 Requirements for the Doctor of Philosophy Degree (8 March 2017)
- ENOI 36-166 Doctoral Program (8 March 2017)
- Doctoral Committee Policy Letter (June 2017)

For your convenience, the above documents are provided in Appendices B, C, and D, respectively, and were effective at the time of printing.

1 ENG Program Requirements

Program requirements are defined in the latest version of the Doctoral Committee Policy Letter (cf. Appendix D). This section addresses interpretations and additional restrictions for ENG students, along with ENG philosophy on our doctoral program.

1.1 500-Level Courses

The 36 hours of course work submitted for the Ph.D. program (24 specialty hours, 8 math hours, and 4 “other” hours) typically will not include 500-level courses. The permissibility of 500-level courses in counting toward the 36 hour requirement will be assessed on a case-by-case basis and approved by the department as part of the initial education plan approval process. The 8 hours math requirement must consist of 600-level or above courses taught by the Department of Mathematics and Statistics.

1.1 Use of Masters Degree Courses

Up to 12 of the required 36 hours may be waived based on graduate courses taken after completing the undergraduate degree. These courses should be part of the specialty sequence and will be tested as part of the specialty sequence exam. Time limits on course eligibility for waiver are specified in the Doctoral Committee Policy Letter. A petition to waive credit hours must be made through the pro-tem advisor, Ph.D. Coordinator, and ENG Department Head to the Academic Standards Committee as shown in an example memo accessible on the L: drive at the link in Appendix A. The two courses required for the math sequence cannot be waived. Furthermore, the total number of graduate course hours (M.S. and Ph.D. combined) cannot be less than 72.

1.2 Ph.D. Specialty Sequence and Specialty Examination

The Specialty Sequence is 24 hours of integrated coursework that supports the student’s research area. To some degree, course selection is guided by the student’s assigned Academic Specialty Code and needs of the follow-on assignment. The specialty sequence may include up to 12 hours of Special Studies (EENG/CSCE 899) courses as well as courses from other EN departments when appropriate.
Both written and oral examinations over the specialty area are required. Typically, the oral portion is conducted as part of the Prospectus Examination, but a separate oral exam may be given (especially when performance on the written portion is marginal). The examination is administered by the student’s research committee and therefore the committee must be formed in advance of the exam (cf. Section 2.10). The specialty examination should be designed so it advances the student’s knowledge and problem solving ability in their research area. The Doctoral Committee Policy Letter on the specialty examination states:

*The Specialty Examination should be different from end-of-course examinations in that it should attempt to synthesize and integrate material from several courses using problems and questions which can be expected to be new to the student. This should place a premium on analysis and original problem solving rather than on recall.*

Upon successful completion of the specialty exam, an appropriate memo or memos will be written to inform the student of the outcome (cf. Appendix A). It is important that passing of both the written and oral portions of the specialty exam be explicitly stated in the memos. Note that the prospectus examination normally constitutes the oral portion of the specialty exam.

1.3 **Ph.D. Math Sequence**

The math sequence includes at least 8 hours of 600-level or higher courses taken from the Department of Mathematics and Statistics. To successfully complete the mathematics requirement, students must earn a grade of B or better in two courses. (cf. Doctoral Committee Policy Letter, 3.5.2 Mathematics Requirement).

1.4 **Residency Requirement**

ENOI 36-114 defines the residency requirement for the Ph.D. degree; the residency requirement is further explained in the Doctoral Committee Policy Letter (cf. Doctoral Committee Policy Letter, 3.6. Full Time Student Requirement). For full-time students meeting this requirement is not an issue. However, for part-time students, meeting this requirement may require advance planning. Please see the ENG Ph.D. Coordinator if you have any questions about this requirement.

1.5 **Research Credit**

Students are required to register for a minimum of 48 quarter hours of research (CSCE 999 or EENG 999). Full time Air Force students should register for 12 hours of CSCE 999 or EENG 999 each quarter of full time research, which normally results in more than the minimum 48 hours. Doctoral Committee policy directs that research registration not be done until approval is received from the research advisor (cf. Doctoral Committee Policy Letter, 3.10. Dissertation Research).
1.6 Course Load
Students typically register for 8-12 hours per quarter over 4 quarters to fulfill the required 36 hours of coursework. Registration for more than 12 hours in any quarter is considered an overload and requires the approval of the Department Head.

2 Administration of ENG Ph.D. Program

2.1 Student Records
Records are maintained for each ENG Ph.D. student in the Department Office. It is the responsibility of each student to make sure that any documents directly received (e.g., notification of passing an exam, admission to candidacy memo, etc.) are submitted to the Department Graduate Advisor for inclusion in the student’s record.

2.2 Progress Checklist
An ENG Doctoral Student Information and Checklist (cf. Appendix A.2) is maintained in each student’s record. The Department Graduate Advisor maintains this checklist.

2.3 Student Desk Assignments
Ph.D. student desk assignments are allocated by AFIT/ENA. Depending upon the number of Ph.D. students, there may be a waiting period to obtain a desk.

2.4 Coordination of Doctoral Program Memos
All action requiring department approval must be sent as indicated on the memo. Sample memos for common actions are included in Appendix A. Students and faculty should use the most current memo templates maintained in L:\Misc\Student Information\ENG\ENG PhD Handbook\ There, users will also find memo template instructions and the current electronic version of the ENG PhD Handbook.

Unless otherwise indicated in the template, memos should be routed from student to advisor to ENG Ph.D. Coordinator for coordination. (Exception: notification of passing exams does not need to be routed through, nor copies sent to the Ph.D. Coordinator.) The Ph.D. Coordinator forwards documents to the Department Head for approval. For those actions needing only department approval, the approved document will then be placed in the student’s record and the student/advisor notified. Actions requiring higher level approval are forwarded to the appropriate office.

2.5 Deadlines
See Appendix A.2 and the Doctoral Committee Policy Letter for deadlines.

2.6 Pro-Tem Advisor
Upon an ENG Ph.D. student’s arrival to AFIT, the ENG Department Head will, in consultation with the Ph.D. Coordinator, appoint a pro-tem advisor (cf. Doctoral Committee Policy Letter, 3.3 Pro-Tem Advisor). The pro-tem advisor will generally be teaching courses and conducting research in the student’s research interest. The pro-tem advisor normally possesses technical expertise in an area related to the student’s research interest.
2.7 **Squadron Officers School**

Ph.D. students will not be released to attend SOS during their assignment at AFIT. Students needing SOS are encouraged to enroll via correspondence and attend in residence as soon as practical after completing their doctoral program.

2.8 **Initial Education Plan Submission**

Entering doctoral students must prepare an initial education plan. The student and pro-tem advisor prepare the education plan and submit it to the ENG Ph.D. Coordinator for coordination and subsequent Department Head approval by the end of the first week of the student’s first quarter (cf. Appendix A). The initial education plan package includes the following documents:

1. Education plan approved by the pro-tem advisor including courses listed by sequence (include MS courses used to waive hours and indicate with an asterisk), projected time of all courses clearly indicated. The indicated program should adhere to the program requirements as defined in Section 1 and the current Doctoral Committee Policy Letter.

2. Copy of memo to Academic Standards Committee requesting waiver of hours based on M.S. courses (if applicable). ASC approval need not be received at the time of package submission.

3. Descriptions of each EENG 899 or CSCE 899 special study course (cf. Appendix A).

After coordination by the ENG Ph.D. Coordinator, the education plan is forwarded to the Department Head for final approval. Once a Ph.D. student’s initial education plan is approved, it is kept in the student’s record.

2.9 **Changes to Initial Education Plan**

Once an education plan has been approved, any changes to the program require submission of a revised education plan. Changes to math courses can be made by updating the education plan (including the comments section), as long as the changes meet the math requirement (cf. Doctoral Committee Policy Letter, 3.5.2 Mathematics Requirement). Changes to the specialty sequence must be accompanied by an updated approval memo (Appendix A) and approved by the Department Head.

2.10 **Advisor and Committee**

After selecting an area of research, the student forms a research committee. See the Doctoral Committee Policy Letter for current guidance on committee makeup (cf. Doctoral Committee Policy Letter, 3.8 Research Committee). The research advisor must be a current member of the Department of Electrical and Computer Engineering. Adjunct faculty may not serve as research advisors. Inclusion of Dayton Area Graduate Studies Institute (DAGSI) faculty on committees is encouraged.

The student sends a memo to the Department Head requesting approval of the committee (cf. Appendix A). This must be done prior to administering the specialty exam. When the committee has been approved, the research advisor replaces the pro-tem advisor for the remainder of the student’s program. Upon being approved, the research advisor
should ensure the students schedule includes a minimum of 48 hours of CSCE 999 or EENG 999 as appropriate.

2.11 Notification of Exam Results
When a student has taken an exam administered by an ENG faculty member, a memo must be written by that faculty member indicating whether the student has passed or failed the exam. The memo is sent through the advisor to the student (cf. Appendix A). It is the student’s responsibility to ensure that his or her advisor has submitted a copy for inclusion in the student’s record (cf. Section 2.1).

2.12 Admission to Candidacy
A Ph.D. student should apply for Admission to Candidacy after completing all coursework, passing the specialty, and successfully defending a research prospectus. See the Doctoral Committee Policy Letter for details and a description of the items that must be in the candidacy package (cf. Doctoral Committee Policy Letter, 3.12 Admission to Candidacy). A student must be admitted to candidacy at least one year before award of a PhD degree. The package should be sent with the appropriate cover memo (cf. Appendix A). Be sure that the submitted education plan is up to date and attach a copy of the Student Grade Summary generated by Academic Evaluation in WebAdvisor.

2.13 Completing the Process
When the student has completed the research to the research advisor’s satisfaction, the advisor will write a memo requesting a Dean’s Representative be appointed (cf. Appendix A). The dissertation defense will be scheduled and prominently advertised within AFIT and WPAFB.

The Office of Student Services should be contacted prior to the anticipated graduation quarter to fill out an “Application for Graduation” form.

After a successful defense, the student and advisor will submit documents according to the Academic Standards Committee guidance, “Requirements for PhD Graduation” to AFIT/ENG (cf. Appendix A.2).

2.14 Academic Program Extension
Extensions to the normal 3 year military assignment to AFIT are handled by AFPC. This section addresses the requirements for requesting and academic program extension.

According to ENOI 36-114, students must complete the degree no later than 4 years after being admitted to candidacy and no later than 8 years after starting the program. Program “start” coincides with when the first course began that is counted as part of the program. Extensions may be granted by the Academic Standards Committee. A memo (cf. Appendix A) must be submitted to the Department Head, stating the reason for the program extension and including a timetable for completion of the dissertation and all Ph.D. requirements. The program extension request is forwarded to the Academic Standards Committee. Any further extensions must be fully justified. The research
advisor must support the request and explicitly recommend the extension if it is warranted.
Appendix A – PhD Program Memos and Timeline

A.1 Memos

Students and faculty should use the most current memo templates maintained in L:\Misc\Student Information\ENG\ENG PhD Handbook. There, users will also find memo template instructions (readme file) and the current electronic version of the ENG PhD Handbook (this document). Versions not adhering to the current templates will be returned. Digital signatures should be used – instructions on signing in MS Word are in the readme file. Wet signatures will not be processed, except in special circumstances.

Memos should be routed as indicated in the templates, typically from student to advisor to ENG Ph.D. Coordinator for processing. Additional coordination with committee members may also be required (e.g. Proposed Research Committee). The Ph.D. Coordinator forwards documents to the Department Head for approval. For those actions needing only department approval, the approved document will then be placed in the student’s record and the student/advisor notified. Actions requiring higher level approval are forwarded to the appropriate office. Memos from advisor to student (e.g. specialty exam, prospectus defense) need not go to the PhD Coordinator, but should cc the department, as indicated, for inclusion in the student’s file.

List of memos:
1. Masters Student Extendee Application for PhD Program
2. Request for Approval of Education Plan – due NLT end of 1st week of 1st quarter
3. Special Study Course Description – due with Ed Plan
4. Petition to Waive Hours – due with Ed Plan
5. Proposed Research Committee – due prior to Specialty Exam
6. Specialty Exam Memo – advisor completes after Specialty Exam
7. Prospectus Defense Memo – advisor completes after Prospectus defense
8. Request for Admission to Candidacy – due after Specialty Exam and Prospectus defense complete; must be completed at least one year prior to graduation
9. Sponsor Memo
10. Request for Appointment of Dean’s Representative – advisor completes prior to Dissertation defense
12. Request for Extension of Time Limit
13. Residency Requirement Memo – not required for quota students
A.2  ENG Doctoral Student Requirements for Graduation and Checklist

ENG Doctoral Student Information and Checklist

STUDENT: ______________________________ Date Entered: ______________________________
Class: DSG-_____________________________ Desk Location: _____________________________
Pro-Tem Advisor: __________________________ Research Advisor: __________________________

ASC Requirements for PhD Graduation Checklist

After successful defense of the dissertation, the Research Advisor is to provide through the Department Academic Standards Committee representative, for forwarding to the EN Academic Standards Committee, the following in advance of graduation:

A. Memo signed by the research advisor stating that the student passed the final defense, including the date, place, and names of the committee present. (If the committee vote was not unanimous, report the actual vote, e.g., passed by vote of 5 to 1). If the committee has voted to approve subject to revisions in the dissertation, the signed cover sheet (Item G below) is taken as evidence that the revisions were made to the satisfaction of all.

B. A copy of the letter of appointment of the research committee that conducted the defense.

C. A copy of the letter of appointment of the Dean’s Representative to that committee.

D. Ensure that the signing committee members were either appointed by letters of appointment or that changes to the original committee were documented and approved, and letters of such changes are also included.

E. A copy of the Dean’s letter of admission to candidacy.

F. The Final Grade Summary Sheet dated "final" and approved, including all grades, title of dissertation, and education codes -or- a completed Academic Evaluation showing “Program Status: Complete”, all remaining hours as “0.00” or “MET”, and Status Complete “C” at the beginning of each subsection. Any courses that appear but are not required as a part of the approved education plan, should be annotated (in the remarks section of the computer record) as such. (This is necessary because of the requirement to complete the degree within eight years of the beginning of the first course in the approved program.)

G. An extra copy of the dissertation cover sheet signed by the committee (or the 3/4 majority including the advisor of the committee who voted to pass) and signed by the Dean. (Electronic signature is acceptable.)

H. Degree requirement waivers, if any, such as time limit extensions, including any supporting documentation that was required in granting the waiver.

I. If the Dean's Representative provides a copy of their report, attach it.

Also include any other documents that should be permanently archived by the Registrar, such as letters of commendation.
## Checklist

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<th>Benchmarks</th>
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<th>Date Completed</th>
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<td>First Quarter Registration</td>
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<tr>
<td>Education plan Package Submitted</td>
<td>1st week of 1st quarter</td>
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<tr>
<td>Education plan entered in database</td>
<td>Upon submission</td>
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</tr>
<tr>
<td>Satisfied math requirement</td>
<td>Per education plan</td>
<td></td>
</tr>
<tr>
<td>Approval of research committee</td>
<td>Prior to specialty exam</td>
<td></td>
</tr>
<tr>
<td>Completed course work</td>
<td>Per education plan</td>
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<tr>
<td>CSCE/EENG 999 scheduled</td>
<td>After research committee approved</td>
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</tr>
<tr>
<td>Passed Specialty Exam Part I (written)</td>
<td>Per education plan</td>
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</tr>
<tr>
<td>Passed Specialty Exam Part II (oral)</td>
<td>Per education plan</td>
<td></td>
</tr>
<tr>
<td>Approval of dissertation prospectus</td>
<td>10 weeks after last course NLT end of 18th month</td>
<td></td>
</tr>
<tr>
<td>Admitted to candidacy</td>
<td>One year prior to graduation but NLT end of 7th quarter</td>
<td></td>
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<tr>
<td>First draft of dissertation</td>
<td>15 weeks before graduation</td>
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<tr>
<td>Revised draft of dissertation</td>
<td>4 weeks before oral defense</td>
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<tr>
<td>Request Dean’s Representative</td>
<td>6 weeks before anticipated defense</td>
<td></td>
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<tr>
<td>Announce/advertise defense</td>
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<td>Passed dissertation defense</td>
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<td>Submitted final dissertation copies</td>
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<td>Submitted graduation package to ASC</td>
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<tr>
<td>Eight year expiration date</td>
<td>8 years from entering full-time status</td>
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Appendix B – ENOI 36-114: Requirements for the Doctor of Philosophy Degree

BY ORDER OF EN OPERATING INSTRUCTION 36-114
THE DEAN

TBD

Personnel

DOCTORAL PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the AFIT web site at:
https://org.eis.afit.edu/dept/en/OperatingInstructions/Forms/AllItems.aspx. If you lack access, contact your program manager.

OPR: AFIT/EN Faculty Council (Doctoral Committee) Certified by: AFIT/EN
(Dr. Adedeji B. Badiru)
Supersedes ENOI 36-114, 01 May 2010 Pages: 3
Distribution: X

This Operating Instruction states the basis for Air University's authority to grant degrees and lists the requirements for the Doctor of Philosophy degree in the Graduate School of Engineering and Management.

1. References.

ENOI 36-166

2. Authority for Granting Degrees. In accordance with Public Law 733 of the 83rd Congress, with the regulations prescribed by the Secretary of the Air Force, and with accreditation by a nationally recognized accreditation association or authority, the Commander, Air University, is authorized to confer appropriate degrees. The recipients of such degrees must be recommended by the faculty of the Graduate School of Engineering and Management in accordance with certain academic standards.

3. Degree Requirements. The Doctor of Philosophy degree may be awarded for the successful completion of a curriculum that has the approval of the faculty as meriting the degree and serving the needs of the Air Force. Degree requirements, policies, and procedures, including waiver policies, are established by the AFIT Doctoral Committee.
and are promulgated in the Doctoral Committee Policy Letters, in accordance with EN Operating Instruction 36-166. Degree requirements are collated and promulgated here.

3.1. Completion of the student’s approved program of study must include:

3.1.1. Three quarters of at least one contiguous four quarter period must be full time study. This requirement may be reduced or waived by the Dean of the Graduate School of Engineering and Management upon request from the student through the student's academic advisor and the Department.

3.1.2. Thirty-six quarter hours of coursework beyond the Master’s degree. Of these, 24 quarter hours must be successfully completed in the specialty area and 8 quarter hours must be successfully completed in meeting the mathematics requirement.

3.2. Admission to candidacy for the doctoral degree is required at least one year prior to receipt of the degree. Admission to candidacy is granted by the Dean of the Graduate School of Engineering and Management. The requirements for admission to candidacy are:

3.2.1. Completion of a Master’s degree in an appropriate discipline.

3.2.2. Completion of the approved program with an average of at least "B" (3.00) on all courses taken.

3.2.3. Approval by the student's research committee of a prospectus for the dissertation project.

3.2.4. Satisfactory completion of the examination in the specialty area.

3.2.5. Satisfactory completion of the mathematics requirement.

3.3. Completion and submission of an acceptable dissertation on an approved research project. This requires:

3.3.1. Satisfactory completion of at least 48 quarter hours of supervised research conducted under the direction of an approved member of the faculty of the AFIT Graduate School of Engineering and Management (the research advisor) and of an approved research committee.

3.3.2. Satisfactory completion of a final oral examination in defense of the dissertation.

3.4. All of the above requirements must be completed no later than eight years from the beginning of the first course in the approved program and no later than four years from admission to candidacy.

3.5. The award of the degree must be recommended by the academic department and the Faculty Council of the Graduate School of Engineering and Management.
ADEDEJI B. BADIRU, Ph.D., PE
Dean
Graduate School of Engineering & Management
Air Force Institute of Technology
Appendix C – ENOI 36-166: Doctoral Program

BY ORDER OF
THE DEAN

EN OPERATING INSTRUCTION 36-166
TBD
Personnel
DOCTORAL PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the AFIT web site at: http://org.eis.afit.edu/dept/en/OperatingInstructions/Forms/AllItems.aspx
If you lack access, contact your program manager.

OPR: AFIT/EN Faculty Council (Doctoral Committee) Certified by: AFIT/EN
(Dr. Adedeji B. Badiru)
Supersedes: ENOI 36-166, 01 June 2011 Pages: 4
Distribution: X

This operating instruction prescribes responsibilities within the Graduate School of Engineering and Management of the Air Force Institute of Technology (AFIT) in administration of the doctoral program. It establishes the Doctoral Committee to set academic policy for the program. It also lists the responsibilities of the Doctoral Committee, the Dean, the heads of academic departments with PhD students, and individual faculty pro tem advisors and research advisors.

1. References.
ENOI 36-137

2. Responsibilities of the Doctoral Committee.

2.1. The Doctoral Committee will establish, maintain, and publish academic policies for the doctoral program. Policy matters will include but are not limited to: Minimum standards of admission, hour and residency requirements, examinations (to include type, purpose and number), rules for administering examinations, qualifications for research committee chairmanship, student role and department role in choosing advisors, qualifications for committee members, acceptable forms of the dissertation, quality goals for the dissertation, and other policy questions that may arise. The Doctoral Committee will monitor and assess the overall progress and success of the doctoral program and revise its policies as needed to further these ends.
2.2. The committee will advise the Faculty Council regarding the establishment or termination of PhD programs within departments. In accordance with the Faculty Council Constitution, the President of the Faculty Council ensures that all recommendations adopted by the Faculty Council are brought to the attention of the Dean, as appropriate.

2.3. The Doctoral Committee will establish and maintain standing rules governing its membership, officers, terms of membership and of offices, operating procedures, etc. In accordance with the Faculty Council Constitution, any proposed changes, additions or deletions to the standing rules shall be submitted to the Faculty Council for their approval.

2.4 By the Faculty Council Constitution, the President of the Faculty Council oversees and coordinates the activities of the Doctoral Committee (a standing committee of the Faculty Council), and ensures Doctoral Committee activities are reported to the Faculty Council. In particular, the President of the Faculty Council assigns tasks to the Doctoral Committee and also provides them with a reasonable timeline for completing these tasks.

3. Responsibilities of the Dean.

3.1. Monitor the operation of the doctoral program in the school and the observance, by departments, of policies.

3.2. Resolve questions of policy compliance by the academic departments when such questions are raised by, or through, the Doctoral Committee or by, or through, an academic department.

3.3. Resolve differences between two or more departments in the school when those departments do not agree on programs, examinations, or advisors for an individual student.

3.4. Maintain a school-wide data base on all PhD students including active students as well as graduates and past students. Coordinate with the Doctoral Committee to define periodic management-information-system reports that are useful in monitoring the progress and success of the doctoral program, and have these delivered to the Chair of the Doctoral Committee.

3.5. Appoint a Dean’s Representative prior to the scheduling of the final defense.

3.6. Give signature page approval to each dissertation after it has been approved by the research committee.

3.7. Approve or disapprove requests for transfer of students from one department to another in cases where Air Force (or other sponsor) requirements can be equally well met in either department.

3.8. Admit to candidacy.
3.9. Jointly with the Doctoral Committee and, more broadly, the Faculty Committee as a whole, advise the Chancellor regarding the establishment or termination of PhD programs within the school.

3.10 Ensure promulgation of the dissertation.

4. **Academic Department Responsibilities.** Academic departments authorized to administer and execute the program shall follow the policies established by the Doctoral Committee. (All references to “department” in this paragraph pertain to the department that admitted the student.) Academic departments will:

4.1. Determine academic eligibility.

4.2. Approve admission of individual students.

4.3. Appoint pro tem advisors.

4.4. Approve the course of study including the education plan and the schedule of examinations.

4.5. Periodically evaluate the academic performance of each doctoral student.

4.6. Appoint the research advisor and committee members, with their consent, at the request of the student.

4.7. Recommend students to the Dean for admission to candidacy.

4.8. Notify the Dean when a student submits a draft dissertation to his or her committee, so that the Dean can appoint a representative to the defense.

4.9. Recommend to the Faculty Council the award of the PhD degree after all the requirements have been satisfied.

4.10. Recommend Academic Review Committee (ARC), (ENOI 36-137) action if needed.

4.11. Retain the student’s official records until graduation.

5. **Responsibilities of Pro Tem Advisors and Research Advisors.**

5.1. Academic counseling and guidance will be provided to the individual student primarily by the research advisor (initially by the pro tem advisor until the research advisor is appointed). This counseling and guidance will be based on the policies set by the Doctoral Committee.

5.2. The pro tem advisor will counsel the student on degree goals, policies, and procedures.

5.3. The pro tem advisor will assist the student in selecting a research area and a research advisor, and in initial preparation of the education plan (until the research advisor is
selected and appointed). The research advisor will assist the student in modifying the plan to best prepare the student for the research and guide the student through coursework.

5.4. The research advisor and the research committee will conduct the specialty examination, approve the student’s research prospectus, and guide the research.

5.5. The research advisor and the research committee will conduct the defense of the research and determine its acceptability monitored by a Dean’s representative appointed for the purpose.

6. Responsibilities of the Dean for Research.

6.1 Notify research sponsors of availability of dissertations.
Appendix D – Doctoral Committee Policy Letter

POLICY LETTER
Doctoral Committee of the Faculty Council
Graduate School of Engineering and Management
Air Force Institute of Technology
Last Review: June 2017

1. The Doctor of Philosophy Degree: Goals and Outcomes.

1.1. Goals. The goals of the Doctoral Program of the Graduate School of Engineering and Management (the School) have long been established by the following description of the program:

“The AFIT doctoral program is based on the following statement by the Council of Graduate Schools in the United States (from The Doctor of Philosophy Degree: A Policy Statement, Oct 1977): The Doctor of Philosophy degree is awarded by universities in many parts of the world as the mark of highest achievement in preparation for active scholarship and research.

“The doctoral program is designed to prepare a student for a lifetime of intellectual inquiry that manifests itself in creative scholarship and research. The program emphasizes freedom of inquiry and expression and development of the student's capacity to make significant contributions to knowledge. An essential element is the development of the ability to understand and evaluate critically the literature of the field and to apply appropriate principles and procedures to the recognition, evaluation, interpretation, and understanding of issues and problems at the frontiers of knowledge. All of this is most effectively accomplished in close association with those experienced in research and teaching.

“A central purpose of doctoral programs is the extension of knowledge, but this cannot be accomplished on all fronts simultaneously. Students must choose an area in which to specialize or a professor with whom to work. Individualized programs of study are then developed and committee members are selected cooperatively as course work is completed and research undertaken. When all courses have been taken, the research finished, the dissertation written, and all examinations passed, the student will have acquired the knowledge and skills expected of a scholar and will have extended knowledge in the field.”

References to the Ph.D. being a research degree follow from the preceding statements.

In addition to the research Ph.D. there also exist in American higher education engineering professional doctorates that prepare the graduate to practice the profession at an advanced level. This applied doctorate is most often titled “Doctor of Engineering”. This applied or professional doctorate places a premium on advanced course work and replaces the dissertation with a practicum or group study. The Council of Graduate Schools contrasts the two programs by “Ph.D. programs lead the student to focus on what he or she can do to the subject; professional degree programs are more concerned with what the student can
do with the subject.” [From The Doctor's Degree in Professional Fields, the Council of Graduate Schools.]

In 1979-1980 the AFIT Doctoral Committee explored initiation of a Doctor of Engineering degree in the resident program. This initiative was rejected by a large majority of the students then in school, by the faculty as whole and by the USAF employers of the graduates (in the 1980 program reviews). All of these groups believed that the research Ph.D. was the best preparation for USAF officer assignment, even though that assignment was more likely to involve the management of research and technology rather than individual investigations. This support for the dissertation research experience has also been observed outside of the USAF. Porter, et al. in a study for the National Science Foundation surveyed 645 Ph.D. recipients in six disciplines including electrical engineering. (Reported in American Scientist 70, No 5, 1982 p 475 and also in Engineering Education Nov 1980 p 162). They report: “The most impressive finding, however, was a broad perception of the dissertation as generally valuable with both researchers and non-researchers...” (American Scientist p 480). In particular among the electrical engineers, two-thirds of whom were no longer engaged in research or teaching, they found “the overall [dissertation research] experience was rated as strongly positive...[and] there was little enthusiasm for any of the changes [including the applied doctorate] among our respondents as a group” (Engineering Education p 164-165).

This experience and additional evidence has strengthened the original requirement that the AFIT doctorate be a research Ph.D. The philosophy and description by the Council of Graduate Schools quoted here in the first paragraph applies to the resident doctoral program and should be taken as the principal direction by advisors and students in establishing individual courses of study and in the selection of dissertation topics.

1.2. Program Outcomes. Program Outcomes are the desired achievements of the program as evidenced by the demonstrated abilities and accomplishments of the students upon graduation. The Program Outcomes of the School’s Doctoral Program follow from the above description of the program objective (goal):

Upon graduation, each student will:

(i) be able to understand and evaluate critically the literature of the field;
(ii) be able to apply appropriate principles and procedures to the recognition, evaluation, interpretation, and understanding of issues and problems at the frontiers of knowledge;
(iii) have acquired the knowledge, skills, ethics, and independence of thought and action expected of a scholar; and
(iv) have extended and effectively communicated knowledge in their field.

1.3. Authority. The Constitution of the School's Faculty Council states that: “The Doctoral Committee shall establish, maintain, and publish academic policies for the doctoral program.” EN Operating Instruction 36-166, Doctoral Program, assigns the Doctoral Committee the following responsibilities:
“The Doctoral Committee will establish, maintain, and publish academic policies for the doctoral program. Policy matters will include but are not limited to: Minimum standards of admission, hour and residency requirements, examinations (to include type, purpose and number), rules for administering examinations, qualifications for research committee chairmanship, student role and department role in choosing advisors, qualifications for committee members, acceptable forms of the dissertation, quality goals for the dissertation, and other policy questions that may arise.”

2. An Overview of the Ph.D. Program

The requirements for the award of the Ph.D. degree in the School are established by the Doctoral Committee and are promulgated by EN Operating Instruction 36-114. This policy letter establishes policy for interpreting and applying some of those requirements. As detailed in the coming sections, in order to be awarded a Ph.D. by the School, a student must successfully:

(i) be admitted to the Ph.D. program (Section 3.1);
(ii) complete at least 36 hours of coursework (Section 3.5) including:
   (a) at least 24 hours in their area of research specialization,
   (b) at least 8 hours of mathematics and/or statistics;
(iii) meet a “full time student” requirement (Section 3.6);
(iv) pass a Specialty Exam based on their specialty sequence (Section 3.9);
(v) complete at least 48 hours of dissertation research (Section 3.10);
(vi) defend their research prospectus (Section 3.11);
(vii) be admitted to candidacy (Section 3.12);
(viii) defend their dissertation (Section 3.13).

Though there is a single Ph.D. program in the School, each Ph.D. student's program of study is supervised and coordinated through a particular academic department (the Department) that corresponds to their area of research specialization. Each department may have degree requirements that are in addition to those listed above, as specified in their Department Brochure. Prior to graduation, the School also usually requires the students to complete several administrative tasks (Section 3.15).

All students are required to meet all degree requirements in the eight years that follow the beginning of the first course in the approved program and no later than four years from admission to candidacy. Though there is some flexibility in the order in which these requirements can be met, a student must have been admitted to candidacy for at least one year before they can defend their dissertation.

Many Ph.D. students are active-duty military personnel who are assigned to the School as full-time students, typically for a period of three years. In this document, such students are referred to as quota students. Other categories of Ph.D. students may include full and part-time civilian DoD employees and DoD contractors, these students are examples of non-quota students.

3. The Steps of the Ph.D. Program.
3.1. Minimum Standards of Admission. For students already possessing a Master's degree, the minimum criteria for admission into the Ph.D. program are as follows:

(i) a quality B.S. program with grades averaging at least 3.0;
(ii) a quality M.S. program with grades averaging at least 3.5, (a successful completion of an M.S. thesis is very desirable);
(iii) GRE scores of at least 156 (verbal) and 151 (quantitative);
(iv) endorsement by the students' M.S. faculty, especially by the M.S. thesis advisor.

For students only possessing a Bachelor's degree, the minimum criteria are:

(i) a quality bachelor’s program with grades averaging at least 3.5;
(ii) GRE scores of at least 156 (verbal) and 155 (quantitative);
(iii) endorsement by the student’s undergraduate faculty.

A Department can substitute the GRE score requirement with an equivalent requirement using another standardized test, such as the GMAT, provided this is common practice in the student's intended area of research specialization. Students who fall short in one of the above areas might be admitted by individual action of the Department. Students who fall short in two or more of the above areas should not expect to be admitted, but may request an academic evaluation by the Department.

3.2. Bachelor Entry to the Ph.D. Program. Academic bachelors with outstanding qualifications, as compared with typical entering Master’s degree students, can be admitted for graduate study as Ph.D. students. This program of study requires that all requirements for the award of the appropriate AFIT Master’s degree be completed as a prerequisite to candidacy. All requirements of these policy letters also apply to the bachelor entry Ph.D. student. The thesis advisor and topic should be chosen with the intent to continue research in the area for the dissertation. Thus, the thesis advisor is also the pro tem advisor, and should normally become the research advisor. The prospectus can cite the thesis for theory, background, preliminary results, etc., as appropriate. In this case, the principal function of the prospectus is to define and scope the dissertation research and to outline the approach and/or research plan. The thesis serves the additional purpose of preparing the student to conduct the dissertation research, including the preparation and defense of the dissertation, in a timely manner.

By formulating an integrated education plan for the Master’s degree courses (36 hours), thesis (12 hours) and doctoral courses (36 hours), and by performing the studies without interruption between the Master’s and Ph.D. studies, substantial efficiencies should be achieved, resulting in the opportunity to pursue the research more fully in the same 18-quarter (4.5 year) program, or possibly, to complete the program in somewhat less time. In the case of direct-entry students, the timelines specified throughout this policy letter will be measured from the completion of the first 48 hours of study. The integrated education plan will be submitted to the department head of the admitting department, not later than the end of the second quarter of study, for approval as meeting the needs of the
USAFA/DOD, as appropriate, and meriting award of the Master’s and Ph.D. degrees. Revisions to the plan require approval of the research advisor and department head.

In the event that a direct-entry student completes, prior to receipt of the Master’s degree, courses that were planned to meet the requirements of the Ph.D. degree, those courses will not be submitted for the Master’s degree and will not be included in the calculation of the GPA for the Master’s degree, but will be carried forward to be submitted for the Ph.D. degree and will be included in the calculation of the GPA for the Ph.D. degree.

3.3. Pro-Tem Advisor. The Department in which the student is admitted will appoint a pro-tem faculty advisor for each student. If the specialty area bridges academic departments, the department head of the admitting department shall designate the pro-tem advisor. This faculty member acts as advisor to the student during the early part of the program and until the selection of the student's research advisor is approved. The pro-tem advisor is responsible for counseling the student on an initial program of study and on any changes to it. The pro-tem advisor ensures that the student's initial program of study is submitted to the admitting department for approval. The pro-tem advisor ensures that the education plan, initially and as revised, will, if executed, satisfy all requirements for the degree. In the case of non-quota students, particular attention must be paid to the residency requirement. The pro-tem advisor also suggests potential areas of specialization representing their own research interests, and those of other faculty members. The pro-tem advisor often becomes the research advisor. The pro-tem should be appointed on this basis whenever practicable. A faculty member should not be appointed as a pro-tem advisor unless the appointing department head is confident that they will meet the criteria for serving as research advisor within the year.

In the case of a bachelor’s-entry student, the pro-tem advisor should serve as thesis advisor for the prerequisite MS degree. It is intended that the thesis serve as the basis for the prospectus. Therefore, the pro-tem advisor / thesis advisor should be qualified to serve as the research advisor (or become so qualified), and should be chosen with the intent that the pro-tem advisor become the research advisor. During the first quarter of study, the student and pro-tem advisor will develop an initial education plan which meets the requirements for both the M.S. and Ph.D. degrees, but which constitutes an integrated and efficient plan, in order to maximize the benefit of courses taken.

3.4. Education Plan. Each Ph.D. student at AFIT is required to have an education plan which outlines their plan for meeting the degree requirements. A preliminary plan covering the first two quarters (only) of doctoral work should be completed upon entry. This preliminary plan is approved by the pro tem advisor. The complete plan for each Ph.D. student will be completed and approved by the end of the first quarter in residence. This approval will include the advisor pro-tem and department head(s). The head's approval indicates a commitment by that department(s) to offer the courses listed and indicates approval of the course of study.

3.5. Coursework Requirements. The AFIT Ph.D. requires, at a minimum, 36 hours of coursework beyond the Master’s degree. This includes at least 24 hours in their area of
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research specialization, and at least 8 hours in mathematics and/or statistics. Dissertation research hours (XXXX999) may not be used to meet this requirement.

3.5.1. Specialty Sequence. As described above, the Ph.D. program is research based. The purpose of the coursework in the specialty area is to bring the student to the forefront of some area of specialization so that they might extend that area with an original contribution. The specialty coursework should not be considered an end in itself but rather a bridge of specific preparation for research. The minimum 24 hours of specialty courses may consist of courses from more than one department as long as these courses form an integrated program designed to make the student an expert in the chosen area of research. In some cases this may require more than 24 hours. These specialty courses normally build on the individual student’s Master's program. The bulk of the specialty area should consist of the most advanced courses available in the chosen area of research. Special studies courses (XXXX899) may be used to meet this requirement. However, at least 12 of the hours used to meet this requirement must come from non-special-studies courses.

3.5.2. Mathematics Requirement. The quantitative and analytical maturity expected of a Ph.D. student must be demonstrated. To achieve this quality goal, Ph.D. studies in the School are to include the study of mathematics and/or statistics. In order to complete this area of study successfully, the student must complete with grades of B or better two courses (a minimum of 8 quarter-hours credit) offered by the School's Department of Mathematics and Statistics at the 6XX level or above. A course taken with a grade below B may be retaken to meet this requirement with advance permission of the Head of the admitting department. Courses from DAGSI partner institutions, if approved, may be used to meet this requirement. The student shall petition the School's Department of Mathematics and Statistics, preferably in advance, to approve such DAGSI courses as being appropriate in content area and level. For Ph.D. students in the Department of Mathematics and Statistics, this requirement is replaced with an analogous requirement for at least two courses (and at least 8 hours of) courses from other Departments related to a single research area.

3.6. Full Time Student Requirement. Three quarters of at least one contiguous four quarter period is to be as a “full time student.” The intent is to ensure that the student has an appropriate period of immersion in the academic life of the graduate school. This helps the student to develop long term professional relationships with a cadre of fellow students and to focus on the selected discipline and research. “Full time student” is defined in ENOI 36-105. Courses taken at DAGSI partner institutions may be included in full time student status but shall not exceed 50% of the course hours taken during the full-time study period.

For off-campus students, the three quarters full time study requirement may be waived by the Dean of the Graduate School of Engineering upon request from the student through the student's academic advisor and the Department. The student with his/her advisor shall develop a program plan (including course work, exams, research, home office resources/support) that requires signature concurrence of the student's home office along with a good-faith commitment to allow a period of time where the student in his/her workplace can be immersed in the Ph.D. program.
A period of long-term full-time training (LTFT) of at least 6 months is the best approach to providing immersion. If LTFT cannot be used, an immersion period with minimal tasking by the employee’s home organization (sponsor) is recommended. Other arrangements may be proposed, but the plan must provide the student a realistic opportunity for success.

A renewal of the workplace commitment shall occur at the beginning of Candidacy.

For the purposes of this policy, “hours” means graded and XXXX999 graduate quarter-hours in the School, or the equivalent. In establishing equivalence, the ratio of class contact hours is the adjustment factor. For example, semester-hours at many universities refer to a 15-week semester, while quarter-hours refer to a 10-week quarter. Thus, 6 semester hours at such a school would be equivalent to 9 AFIT quarter-hours.

3.7. Research Advisor. The student selects a field of specialization (research area) and a faculty member expert in that area to act as their research advisor and research committee chairperson. It is in the best interest of the student to select a topic area and advisor as soon as possible so that the research advisor can help determine the selection of courses to be taken in preparation for the research and to give the student as much head start on the topic as possible. However, the student-research advisor relationship constitutes a significant commitment by both parties and should not be entered into tentatively. The student should understand that the faculty member might make commitments to funding agencies or sponsoring organizations in order to support the intended research on the basis of the student’s commitment to carry out that work. Nevertheless, it is sometimes necessary for a student to change to a different advisor. When such a situation arises, the change should be accomplished as soon as possible.

Once a prospective research advisor is chosen by a student, and that faculty member has agreed to accept that student, they request the appointment by the head(s) of the student’s admitting department and of the faculty member’s department. Upon appointment, the research advisor replaces the pro tem advisor, keeps the education plan current and ensures that any revised plan will meet all requirements for the degree. In the case of non-quota students, particular attention must be paid to the residency requirement. The research advisor advises the student throughout the remainder of the program, including: formation of the research committee, the specialty exam, the prospectus, the research project, writing of the dissertation, and any other matters pertaining to the student’s program.

To serve as research advisor, a faculty member must have an earned Ph.D. or equivalent degree, must have been regularly appointed as a faculty member in the School at the academic rank of Assistant Professor or above, and must be currently pursuing an active research program. Additionally and regardless of academic rank, the faculty member: (1) should have performed sufficient research to indicate a high probability of successfully guiding the student to completion, including having brought research activity to (acceptance for) archival publication, (2) must have at least one year of graduate teaching experience at AFIT, and (3) should have successfully advised one M.S. thesis. A prospective research advisor may serve as pro-tem until these conditions are met but must
meet these conditions in time to form the research committee and conduct the specialty examination without delaying the student’s progress.

A faculty member who has not yet advised a successful Ph.D. research effort (the student graduated) should not serve as research advisor for more than two Ph.D. students at the same time, and each research committee will include at least one member of the School's faculty who has advised a successful Ph.D. research effort. In this case, this latter faculty member must be appointed to the research committee at the same time as the research advisor is appointed. However, the entire committee need not be selected at that time. In all cases, the research advisor-student relationship must be mutually acceptable.

3.8. Research Committee. The research committee shall be chaired by the research advisor, and shall consist of no fewer than three AFIT/DAGSI faculty members, who must represent at least two academic departments from within the AFIT/DAGSI Schools of Engineering and Management. (This number includes the research advisor but not the Dean’s representative.) Note that DAGSI faculty members are those tenured and tenure-track faculty members of the Dayton Area Graduate Studies Institute (DAGSI) member institutions who have been so designated through DAGSI's approved procedures. Prominent scientists or engineers, not members of the AFIT / DAGSI faculty, may also be members of the committee. Non-DAGSI faculty may serve on research committees on this basis, but in any event, AFIT faculty members, including the Dean's representative (described in the policy letter “Evaluation and Defense of the Dissertation”), shall always constitute a majority. The full research committee membership, including the research advisor but not including the Dean’s representative, must be approved by the department head of the admitting department. Changes in the composition of the research committee must be approved by the department head of the admitting department.

3.9. Specialty Examination. A written and oral examination in the specialty area is required for each Ph.D. student. The oral part may be included in the Prospectus Examination or it may be part of the Specialty Examination or both. The Specialty Examination has two objectives: to measure the student's mastery of the specialty area and to measure their readiness to define a dissertation research area.

The Specialty Examination should normally be administered before the end of the fifth quarter in residence. It will be administered by the student's Research Committee. The Research Committee typically invites other faculty to submit and grade questions for the Specialty Examination, particularly those that specialize in a subject to be included in the exam. The examination should cover the specialty work taken to that time as specified in the student's education plan. If the student's education plan includes specialty courses during the fifth and later quarters, the Research Committee may elect to include additional Specialty questions as a part of the Prospectus Examination. Since the Specialty Examination is administered by the Research Committee, it is obviously necessary for the student to form that Committee before the specialty examination. The Specialty Examination should be different from end-of-course examinations in that it should attempt to synthesize and integrate material from several courses using problems and questions which can be expected to be new to the student. This should place a premium on analysis and original problem solving rather than on recall.
3.10. Dissertation Research. A minimum of 48 hours of research, supervised by a member of the faculty of the Graduate School of Engineering, are required for the doctoral degree. Departments will not approve enrollment for research registration until the research advisor has been approved. While dissertation research earns credit, the grade assigned will be S (Satisfactory) or U (Unsatisfactory). One grade of U is a possible, and two a probable, cause for elimination from the program.

3.11. Prospectus Examination. After the student has prepared a prospectus on the selected dissertation research project, the Research Committee will examine the student on that prospectus. Normally this examination will be an oral examination conducted after the committee has had an opportunity to study the prospectus. The prospectus examination will be graded as “pass” or as “not yet ready”. Therefore, it can be viewed as an ongoing process, in which the “defense” can be adjourned and reconvened (as necessary) until the prospectus is accepted by the committee. This examination should be completed by the end of their seventh quarter after admission into full-time study in the Ph.D. program. (Note that completion of coursework is not an explicit prerequisite to the prospectus examination. If unusual scheduling constraints require delaying a course to the seventh or later quarter, then the student should have had XXXXX999 hours earlier in the program in which to prepare the prospectus.)

The committee's approval of the prospectus implies at least the following:

(i) the research, if it is successfully completed and if it does yield new knowledge, should merit the award of the Ph.D. degree;
(ii) the student's understanding of prior work and underlying principles is sound;
(iii) the student's proposed approach to the problem is sound;
(iv) the committee will indicate their approval by signing the prospectus cover sheet.

If a student fails to pass the prospectus examination by the end of their seventh quarter, their progress will be reviewed by the student’s admitting department, and corrective action will be as approved by the department head. Note that failure to be admitted to candidacy by the end of their seventh quarter can result in referral to an Academic Review Committee. Furthermore, if a student fails to pass the prospectus examination by the end of their eighth quarter, the student's department will review the circumstances and forward its recommendation for Academic Review Committee action to the Dean of the School.

3.12. Admission to Candidacy. After completion of the approved course of study and all examinations (except the dissertation defense), and after committee approval of the research prospectus, the student should submit a request to the Dean through the research advisor, department head, and the Academic Standards Committee of the School’s Faculty Council, requesting admission to candidacy for the Ph.D. degree. The Research Advisor shall recommend the effective date of admission to candidacy in their endorsement of the request, add the below-listed attachments to the student's request, and forward the package
to the school Dean through the Head of the admitting department and the Academic Standards Committee of the School’s Faculty Council.

It is a degree requirement that students be admitted to candidacy at least one year prior to the award of the degree. Quota students who have not been admitted to candidacy by the end of the seventh quarter from the beginning of the first course in the approved program shall be considered to be exhibiting unsatisfactory progress. Such cases will be reviewed by the student's admitting academic department for possible referral to an Academic Review Committee.

The effective date of admission to candidacy is the date at which the last requirement for candidacy has been met. Normally, this is the date of the research advisor’s signature on the prospectus. This becomes the effective date of admission to candidacy when admission to candidacy is granted by the school Dean, unless the Dean specifies a different effective date in their letter of admission to candidacy. The Academic Standards Committee will review the request and attachments and forward its recommendation to the Dean. Every attempt will be made to correct any deficiencies in the package before an adverse recommendation is forwarded.

The package for admission to candidacy should include:

(i) A copy of the current approved education plan, including grades on all courses that have been completed. The remarks section must identify the specialty courses and the courses used to satisfy the mathematics requirement.
(ii) A memo (or memos) from the research advisor giving the date and outcome of both the written and oral parts of the Specialty Examination. (The oral part may be included in the Prospectus Examination.)
(iii) Evidence of Committee approval of the research prospectus. Usually this is the prospectus title page with committee signatures affixed.
(iv) A copy of the letter of appointment of the research committee that conducted the prospectus examination.
(v) For non-quota students, a memo from the research advisor, through the head of the admitting department, indicating how the full time student requirement has been met or is planned to be met.

These items will be returned to the research advisor after the Dean's action.


3.13.1. Nature of Dissertation. Dissertation research shall be an original independent effort by the student that makes a publishable contribution to the student's chosen field of knowledge. With the exception of such progress reports as may be required by the sponsoring agency, no publication of the results of dissertation research will be made prior to acceptance of the dissertation without the approval of the student's Research Committee.
3.13.2. Format of Dissertation. The format of the dissertation is described in the AFIT Style Guide for Theses and Dissertations.

3.13.3. The Draft Dissertation. The Research Advisor will normally request a first draft of the dissertation for preliminary review. When the Advisor is satisfied with this first draft or at his/her discretion, when satisfied with the research itself, they will request that the school Dean appoint a Dean's Representative to the committee. The Advisor will then ask the candidate to provide each member of the committee with a copy of the draft dissertation. This final draft should follow the format described in the AFIT Style Guide for Theses and Dissertations. In the absence of any action by the Advisor, the candidate may submit final draft copies directly to the committee members including the Advisor.

3.13.4. Evaluation. The committee will independently read and evaluate the final draft. The Advisor will poll the committee to decide if a defense should be held. The decision to proceed with a defense must be supported by a three-fourths majority of the research committee (including the Advisor). The defense should not be scheduled until this time. In particular, the defense should not be scheduled when the final drafts are first received. There is little reason to proceed with a public defense if the committee is not satisfied. If the decision is positive, the defense of the dissertation will be scheduled as soon as possible. The decision should be communicated to the candidate not later than four weeks after the receipt of the draft, and the defense should be scheduled not later than two weeks after the decision is announced. The draft copies may be returned to the candidate with suggested revisions or, if the revisions are minor, the drafts may be held by the committee until after the defense.

3.13.5. The Defense. The oral defense of the dissertation is a public event, and its time and place should be given the widest possible public dissemination among the local technical community. This may include, as appropriate, public notices within AFIT, notification of sponsoring agencies, notices in organizational bulletins, and the notification of appropriate base laboratories or sister academic institutions when the subject matter is of interest to them. The defense will be held at AFIT. The defense will be judged by the Research Committee. (The process of the defense is monitored by the dean's representative, as detailed in a later section.) The written dissertation and the results of this defense will be judged satisfactory if they have the approval of a three-fourths majority (including the Advisor) of the committee. The committee may approve the defense subject to further revisions in the written dissertation.

3.13.6. Unsuccessful Defense. If the defense or dissertation is not approved by the committee, the defense may be repeated after submission of a revised draft to the entire committee. Again, a three-fourths majority including the advisor is necessary to schedule a second defense. At any time the student may petition the admitting department to reconstitute his/her committee under the same or a different Advisor. If approved, the new Advisor will ask the school Dean to appoint a Dean's Representative, who may be the old representative or a new one. If a reconstituted committee is approved, a three-fourths majority of the new committee is still necessary to proceed with and to approve the defense.
3.13.7. **Cover Sheet Signatures.** After evaluating the final copy of the dissertation, insuring that any revisions requested by the committee have been made, all committee members and finally the Dean of the appropriate school will sign the dissertation approval page. These signatures indicate approval of both the oral defense and the dissertation. The names of any committee members who do not vote to approve the defense and/or research are not to appear on the cover sheet.

3.14. **Dean’s Representative.** The Dean appoints a representative to each student’s doctoral committee when the student’s dissertation is ready for final reading by the committee. The Dean’s representative monitors the process of final evaluation and defense of the dissertation and may serve as an independent evaluator of the merit and quality of the work. The Dean may select their representative without suggestions from the committee or department. To serve as Dean’s representative, an individual must be a tenured or tenure-track member of the School's faculty at the level of Assistant Professor or above.

As monitor of the process, it is the duty of the Dean’s representative to ensure that the dissertation defense is held in accordance with the Faculty Council's policies. Therefore, a Dean’s representative should review this policy letter prior to the defense.

It is also the duty of the Dean’s representative to monitor and report on the fairness and effectiveness of the defense process. For example, if the student is not afforded a real opportunity to answer questions, but is being badgered, the process is unfair to the candidate; on the other hand, if the research advisor or other committee members are answering questions that are properly addressed to the candidate, the defense does not properly adjudge the candidate’s work and abilities. Similarly, the public should have its opportunity to question the work.

The Dean’s representative does not serve as a member of the committee, and votes neither on whether to proceed to the defense nor on whether to accept the dissertation. Consequently, the Dean’s representative is not included on the signature page.

As evaluator, the Dean’s representative receives a copy of the dissertation at least two weeks before the defense to review. However, the Dean’s representative is not expected to serve as a technical expert in the work reported in the dissertation, or even in the discipline of the work, but rather as a competent scientist or engineer. Questions the Dean’s representative should be able to address include, for example: “Does the dissertation communicate clearly? Does the evidence presented justify the conclusions drawn? Is the evidence credible? Are the originality and merit of the work evident? Do the candidate’s presentation and response to questions indicate that the student has conducted the research independently and has mastered the material involved? Does the candidate understand the field well enough to explain the research to someone who is not already an expert in the topic?”

The Dean’s representative will bring a sufficient number of Dissertation Defense Evaluation Forms to the defense, will ensure each committee member fills out the form, and will deliver the completed forms to AFIT/ENW. A copy of this form is available on the Doctoral Committee web page on the AFIT Intranet.
The Dean’s representative shall submit a written report to the Dean summarizing their observations about the conduct of the defense. The report will also include the number of publications resulting from the doctoral effort that (1) are in preparation, (2) have been submitted, and/or (3) have been accepted or published. If the Dean’s representative has reservations about the quality of the work or the decision of the committee, these will be included in this report. Major concerns should be discussed with the Dean. The faculty rely upon the Dean for ultimate quality assurance in such cases.

3.15. Final Administrative Duties. Students should be aware that in order to graduate, they are usually expected to perform several administrative tasks regarding the documentation of their fulfillment of the degree requirements as well as the dissemination of their dissertation. These tasks are specified in checklists published by the Academic Standards Committee (ASC) and the Thesis Processing Center (TPC).

All completed PhD dissertations will be archived at AFIT and available through the AFIT library. Distribution A dissertations should be readily searchable and available for public release. Limited distribution and classified dissertations will be archived and available according to the appropriate distribution guidelines.

4. Miscellaneous.

4.1. Standards of Work. Each student is expected to perform at a high academic level and maintain a grade point average of at least B (3.00) on the course work, and meet all program requirements and deadlines.

4.1.1. Standards of Coursework. A student's performance is deemed unsatisfactory if they receive a grade lower than C (2.00) or two grades lower than B (3.00). A student falling into this category will be recommended to an Academic Review Committee to be dropped from the Ph.D. program. A student in this situation can petition, through their Research Committee (or Pro-tem Advisor if the Research Committee has not yet been formed), to the head of the admitting department to continue in the Ph.D. program for one, or at most two probationary quarters in order to demonstrate their capability to do Ph.D. quality work (course work and dissertation). The individual must cite the reasons for their poor performance. This petition must be approved by the Research Committee (or Pro-tem Advisor). If the committee/pro-tem advisor makes a favorable recommendation, they must stipulate the conditions that must be satisfied during the probationary period. In particular, if a student who has received a grade lower than C (2.00) is permitted to continue in the program, the grade must be resolved by repeating the course concerned (for no credit), or by taking an appropriate substitute course (for no additional credit) and achieving a grade of B or better. For a substitute course to be appropriate, it must be recommended by the student's Research Committee (or Pro-tem Advisor) and approved by the head of the admitting department.

4.1.2. Specialty Exam Standards. After taking (or retaking) the Specialty Exam, a student will be informed of the examination results (pass/fail) within 30 days. Usually, students will be notified in much less time. In the event that the Research Committee determines
that a student has failed the exam, the Department Head will review the circumstances and forward their recommendations to the Dean of the School. Such recommendations should include whether the student should be permitted to retake the Specialty Exam, and/or whether to convene an Academic Review Committee. Normally, no student will be permitted to retake any examination more than once.

4.1.3. Admission to Candidacy. If a student fails to be admitted to candidacy by the end of their seventh quarter, the Department Head will review the circumstances and determine whether the student should be granted a one quarter extension for admission to candidacy, or alternatively that the student should appear before an Academic Review Committee for final disposition, i.e. to be dropped from the Ph.D. program. Normally, a maximum of two quarters extension will be granted.

4.2. Waivers from Required Coursework. A Ph.D. student may petition the Faculty Council through the advisor and the Academic Standards Committee for a waiver of the 36-hour course requirement. Such a waiver would require documentation that the student has successfully completed courses at AFIT or another university within 8 years of the students expected graduation date, that are normally included in the AFIT Ph.D. program of their chosen discipline, and that the program constitutes a well-integrated specialty sequence. Waived courses cannot be used in meeting the mathematics requirement. No more than 12 credit hours may be waived under this provision. A course cannot be waived if the waiver would reduce the total number of graduate course hours (excluding Master’s thesis hours) to less than 72 quarter hours. Material from waived courses that are included in the specialty sequence normally will be included in the Specialty Exam. The waiver serves to reduce the required quarter hours from 36 to a smaller number, and the student’s GPA is then computed from the reduced hours. Waived courses may have already counted toward a separate degree. To aid with the assessment of the Ph.D. program, the Academic Standards Committee will provide the Doctoral Committee with access to copies of approved and disapproved waiver request packages.

4.3 Waivers from the Required Timeline. Students are required to complete all degree requirements within a contiguous eight year time period, and at most four years from when they were admitted to candidacy. If a student is unable to meet one or both of these deadlines, they may petition the Faculty Council via the Academic Standards Committee for a one-year extension. Such requests should include a reasonable, detailed plan for accomplishing all degree requirements within the extended timeframe, and are normally endorsed by the student, the advisor, and the Department Head. At most two such extensions may be granted over the course of their degree program.

4.4. Institutional Credits on Publications Resulting from AFIT Dissertation Research. The publication of the results or partial results of dissertation research is encouraged. If an article, note, or other communication is submitted before the final defense, it shall have prior approval of the student's advisor and/or Research Committee. Joint authorship is acceptable. The Research Advisor or other committee members will often be legitimate coauthors. The student will usually be the first author. More rarely the Advisor will be the first author when the article reports more than the dissertation results. Regardless of where the student is currently employed, their affiliation shall be listed as
4.5. **Classified Dissertation Research.** Research areas that are important to national defense often involve classified information, and it is appropriate for AFIT Ph.D. students to conduct research in these areas. The primary goal is for the dissertation (the document itself) to be publically releasable and unclassified. This is necessary for academic accountability and for review by accrediting agencies. It is also in the best interest of the graduate to be able to publish archival articles based on the dissertation and to be able to use the dissertation throughout their career, for example, when applying for positions or grants. To achieve both these ends, the dissertation should be Distribution A and report on unclassified research, such as the development of a new theoretical analysis or computational or experimental technique. However, it is also important to recognize that the responsibility for making a classification determination of research findings and research related documents, to include the doctoral dissertation, does not solely rest within AFIT (students, faculty, and/or staff) and external entities can direct influence or even dictate the final determination. In such cases, there is no academic basis for deviating from recommended or imposed security classification constraints and AFIT researchers are duty bound to appropriately protect the information. Of greatest importance to this policy letter is that a classification elevation decision (unclassified to classified, confidential to secret, or higher), which could come at any point in a student’s academic program, should not negatively impact the student’s program and jeopardized his/her opportunity to complete.

Regardless of the research classification, there must be sufficient contribution to warrant award of the degree. The student’s classified research may entail the application of new analysis methods or processing techniques using classified data, or have direct applicability to developmental or operational system performance; such common factors routinely dictate a higher classification level. Therefore, exceptions to this policy (i.e., classified dissertations) may be necessary. Possible justifications for exceptions include: (a) timely need for and importance of classified research that can only be practically achieved by an AFIT Ph.D. student, (b) the research topic and/or contributions being deemed classified when the time remaining in the student’s program is insufficient to start an unclassified project without jeopardizing the student’s opportunity to succeed, or (c) the professional field of specialization for which the student is preparing predominantly relies on classified research. These considerations motivate the following policies.

**4.5.1.** Regardless of classification, the dissertation must be sufficient in itself to warrant award of the degree.

**4.5.2.** If unclassified, the dissertation will neither include nor reference any classified material.
4.5.3. If unclassified, the defense will be public. The existence of any classified research should not be revealed, and must not be cited as a basis for accepting a dissertation that is not sufficient on its own merits.

4.5.4. If classified, all members of the committee, including the Dean’s representative, must be cleared to the appropriate level to access the dissertation and support defense activities. Individual “need-to-know” is always a criteria for granting access to classified material and for some special programs, certification of need to know requires concurrence of the controlling agency. The classified dissertation defense will be advertised to, and may be attended by, those members of the community who have the necessary clearance, access, and need-to-know.

4.5.5. Before accepting a topic that would require the dissertation to be classified, the prospective research advisor will submit to the school Dean, through the head of the advisor’s department, a memorandum request for a waiver of the policies 4.4.2 and 4.4.3 above. The approved memorandum will be included in the request for candidacy package and in the graduation package submitted to the Academic Standards Committee. These packages must contain all the normally-required documents, but must only include unclassified documents. The graduation package must contain a final document signature page indicating acceptance by the committee and the Dean. The advisor is responsible for obtaining an approved unclassified dissertation title from the sponsor(s).

4.5.6. From time to time, security classification guidelines are revised and new guidance is issued. Sometimes areas are found to be of sufficient importance to the national interest to warrant classification of existing information. If the dissertation research or the dissertation itself becomes classified during the student’s program, the policies and procedures in this instruction will then apply and a waiver will be obtained as described in paragraph 4.4.5. In this case, the waiver authorizes continuation, rather than commencement, of the research.

4.5.7. In any event, before pursuing a dissertation topic that entails classified research or which may result in a classified document, the research advisor will:

4.5.7.1. Consult with the sponsor(s) to identify the appropriate classification level and any special access controls, etc., that will apply.

4.5.7.2. Consult with the AFIT security manager regarding the procedures and facilities necessary to conduct the envisioned research and protect the information that will be used or generated, and the availability of these facilities.

4.5.7.3. Coordinate with the sponsor(s) regarding the potential use and availability of specific off-campus facilities and resources, should they be needed.

4.5.7.4. Ensure that a Project Security Plan (PSP) is in place for conducting the research. The PSP will provide the practical details necessary to ensure that the work can proceed successfully while meeting all applicable security requirements. The PSP construct is project dependent and may include a compilation and citation of existing
guidelines, specifically tailored guidelines required by the research sponsor(s), or combination thereof. The PSP will be coordinated through the security manager and approved by the responsible department head. Upon approval, the research advisor is responsible for ensuring that the PSP is updated and maintained if/when changes to security guidelines occur.

4.5.8. After obtaining the Dean’s waiver approval per item 4.4.5, the research advisor will inform all program participants (student, committee members, etc.) that research in the proposed topic area can proceed. The research advisor is responsible for ensuring that all research activity occurs in accordance with the waiver and that all participants are aware of established PSP requirements.

4.5.9. Classified dissertations are part of the AFIT Library archive and will be retained indefinitely. They will be destroyed only with written permission of the Dean. If destruction is required by higher authority according to applicable Security Classification Guides, the Dean will be informed prior to destruction. Indefinite retention is essential to academic accountability to accreditation agencies and has long been accepted academic procedure. If a dissertation is destroyed, the Dean’s memorandum authorizing the destruction will be retained in the archive in its place.

Appendix. Ph.D. Pre-Graduation Actions & Checklists.


Send a memo to the school Dean requesting that a Dean's Representative be appointed to the committee. This is normally done at least four weeks in advance of the anticipated defense date. In the request include the dissertation title, the names of the currently-approved committee, and the date of admission to candidacy.

Distribute copies of dissertation to the committee far enough in advance to give them time for a careful reading. This is normally done four weeks in advance of the anticipated defense date.

Poll the committee for a decision whether to proceed to a defense. This must be done at least a week in advance of the defense so that adequate notice of the defense can be given.

Post notices in AFIT notifying the faculty and student body of the defense, title, time and place. Any other appropriate actions necessary to notify the local technical community (Laboratories, sponsors, other academic institutions, etc.) should also be taken.

A.2. Students after a Successful Defense and All Revisions are Accepted.

Obtain a current graduation checklist from the TPC (AFIT Thesis Processing Center) and perform all necessary actions.

Obtain a current graduation checklist from the Academic Standards Committee (ASC) of the School, and perform all necessary actions.
Check with AFIT/EN to make arrangements for graduation. This includes providing contact information so that the School can coordinate graduation with you, and coordinating with your research advisor to draft an abstract to be read at the graduation ceremony. Be advised that the Ph.D. degree is conferred only at the March graduation. However, it is AFIT practice to code your military personnel record (if applicable) “Ph.D.” as soon as the ASC recommends award of the degree to the Dean.


Perform the requisite actions specified by the TPC and ASC checklists. These duties include, but are not limited to, forwarding the following documentation to the School's Academic Standards Committee:

A memo signed by the research advisor stating that the student passed the final defense. Include date, place, and names of the committee present. (If the committee vote was not unanimous, report the vote, e.g., passed by vote of 5 to 1). If the committee has voted to approve subject to revisions in the dissertation, the signed cover sheet (item 4 below) is taken as evidence that the revisions were made to the satisfaction of all.

A copy of the letter of appointment of the research committee that conducted the defense, and a copy of the letter of appointment of the Dean’s Representative to that committee.

A copy of the Dean’s letter of admission to candidacy and the ASC’s memorandum or endorsement that forwarded the request to the Dean recommending approval.

The Final Education Plan, dated “final” and approved, including all grades, title of dissertation and education codes. Any courses that appear but are not required as a part of the approved education plan should be annotated as such. (This is necessary because of the requirement to complete the degree within eight years of the beginning of the first course in the approved program.)

An extra copy of the dissertation cover sheet signed by the committee (or the 3/4 majority including the advisor of the committee who voted to pass) and signed by the Dean of the appropriate school.

Degree requirement waivers, if any, such as time limit extensions, including any supporting documentation that was required in granting the waiver.

Optional: If the Dean's Representative gives you a copy of his report, attach it. Also include any other documents that should be permanently archived by the Registrar, such as letters of commendation.

A.4. Academic Department.

Forward the package received from the advisor, with a cover letter indicating the Department’s recommendation for award of the degree, to the School’s ASC.
A.5. Academic Standards Committee (ASC).

The School’s Faculty Council establishes specific responsibilities and procedures for its ASC that implement Doctoral Committee policy and such quality assurance functions as the Faculty Council deems appropriate. These actions should include the following activities:

Review and approve (or return for correction) the student’s graduation package promptly upon receipt from the department.

Once accepted (no further corrections are needed), forward the package by memorandum or endorsement to the Department’s recommendation letter, to the Dean, with the ASC’s recommendation.

Upon recommending award of the degree, inform the Registrar’s office by memorandum that the student’s military record (if applicable) is to be immediately coded to indicate completion of the Ph.D.

A.6. Registrar.

Upon receipt of the ASC’s memorandum described above, code the student’s military record to indicate completion of the Ph.D. as of the date of ASC’s memorandum. This applies to active duty or reserve students of all branches of the service. Coordinate with non-Air Force students’ personnel department as necessary to achieve this. It should be noted that the timeliness of this action is essential to ensure that the student’s records are current in the event that any board should review the record before the actual conferral of the degree at graduation.