

## 3.6 Theses and Dissertations

### A. Theses and Dissertations

In degree programs requiring the preparation of a thesis or dissertation, students must undertake an original investigation into a subject approved by their advisory committee. For master's students, this investigation is documented in a thesis, while for doctoral students, it is presented in a dissertation. Both theses and dissertations must contribute to the body of knowledge in the student's field, supported by data, and written to the highest standards of scholarship.

All theses and dissertations must be submitted in accordance with the Electronic Thesis and Dissertation (ETD) Guide (<https://grad.ncsu.edu/students/etd/>). By submitting their work to the ETD system, students acknowledge that it will be made publicly available through the University's digital repository. Additionally, these works will be archived and made accessible via the ProQuest Dissertation & Theses Database (PQDT). Students retain all other ownership rights to the copyright of their work and may use it in future publications, such as articles or books.

Theses and dissertations must be submitted to the advisory committee at least two weeks prior to the final defense. Failure to do so may result in the postponement of the final defense.

### B. Company-Funded Research

For thesis or dissertation research that is funded by a company, students and their advisors must ensure that there is a clear agreement as to the ability to place the results in an ETD and, should there be proprietary information, that a mechanism be in place to ensure that the ETD remains viable. Furthermore, if a company's requires approval of the document prior to a defense, this will require additional lead time to insure that only the appropriate information is included.

### C. Submission Procedures for Theses and Dissertations

1. All advisory committee members must approve the thesis/dissertation prior to submission to the library for publication.
2. After receiving an unconditional pass on the final oral exam, the student must submit the thesis/dissertation electronically to the ETD system.
3. A thesis/dissertation must be submitted by the ETD deadlines as published in the Graduate School Calendar.
4. At the time of dissertation submission, students are also required to submit the required forms and fee as outlined on the ETD website. The Graduate School will not award the degree until these forms and fees have been submitted.

### D. Publication in Compliance with Nondisclosure Provisions

Theses and dissertations containing disclosures of patentable discoveries may be embargoed by submitting a request through the ETD system. They may be granted for up to one year. Placing an embargo on a thesis

or dissertation until a patent application is filed will not prevent a student from graduating on time.

### E. Artificial Intelligence policy for dissertations and theses \*

#### Overview

Large Language Models (LLM) such as ChatGPT and, more generally, tools from Generative Artificial Intelligence (GAI) have impacted academic work by assisting in research and writing as well as by providing feedback and assessment, among other emerging applications. These tools offer promises of increased efficiency but also bring to the fore delicate questions about the very nature of our work. The goal of this document is to propose a framework to allow our graduate students to use these tools ethically while developing their dissertations and theses.

The debate on the use of LLMs within Academia is raging and is somewhat reminiscent of the debate on the use of calculators at school.

In fact, LLMs are sometimes described as "calculators for words". We summarize the position of the NC State Graduate School on the matter as follows:

- Our students would benefit from receiving training on how to use GAI tools efficiently, ethically and reliably.
- The mere use of LLMs does not constitute plagiarism; the uninformed and/or poorly documented inclusion of outputs from LLMs into dissertations and theses may constitute a form of plagiarism.

The Graduate School follows one main guiding principle which largely matches the approach proposed in Nature and other publications, such as Science.

#### Guiding principle

- **Candidates utilizing GAI tools must document their use clearly and thoroughly in their dissertation or thesis.**

#### General guidance for graduate students and advisors

- Graduate students should discuss general authorship principles and issues as well as acceptable use of LLMs or other GAI tools as early as practically possible with their advisor.
- Advisors need to be direct and transparent about what tools students are permitted to use, and about the reasons for any restrictions. Additional guiding principles and approaches for the use of GAI in their specific field(s); if such principles are adopted by the program, they must be clearly communicated to the students and applied uniformly by advisory committees.
- GAI tools raise issues of privacy and intellectual property. Material submitted can become part of the application's database, user's information may be collected and cookies installed to track further activity.

#### Bias and Statistics

- LLMs are models; therefore, there are inherent biases associated with them. Users must, at a minimum, be aware of the existence of such issues. For instance, LLMs may attempt to "average" the set of opinions they are trained on which may

lead to surprising and/or unwanted results (statisticians will tell you that averages may be low probability states...).

- The accuracy, or lack thereof, of detection tools for AI-generated texts has been studied. Due to their unreliable nature, the use of AI tools claiming to detect LLM generated text is discouraged.

## Other editorial issues

- The guidelines from Nature also state that no LLM tool should be credited as co-author on a research paper. That is because any attribution of authorship carries with it accountability for the work, and AI tools cannot take such responsibility.
- The above guiding principle does not directly address the use of GAI in generic courses. For additional guidelines, please, refer to the Navigating the Landscape of Higher Education in the Age of Artificial Intelligence page from the Office for Faculty Excellence or to Developing an AI Syllabus Statement for Your Course from Delta.
- The use of writing assistance tools such as Grammarly is generally allowed and rarely acknowledged. Grammarly, for instance, is in fact based on GAI. If in doubt, students should contact their advisory committee and/or err on the side of caution and acknowledge use. This very document was typed using the Google Docs Editor with Smart Compose (another AI based tool) turned on and hereby acknowledged. Clearly, legislating all this to the n-th degree will not be possible because of the constant evolution of the tools available to us; good judgment from all sides is likely to be needed.

## Definitions

- Generative Artificial Intelligence (GAI) is the broad category of AI capable of generating new data such as text, images, video, music and other forms of media.
- Large Language Models (LLM) are a subset of GAI and are designed to work with human language (language is the focus) such as ChatGPT.
- Writing Assistant Tools are designed but not limited to checking spelling and grammar, such as Grammarly.

\* This document has benefited from consultations with the NC State Office for Faculty Excellence (<https://provost.ncsu.edu/ofe/>) and with the Data Science Academy (<https://datascienceacademy.ncsu.edu/>).

## F. Authorship Statement

1. Expectations regarding authorship and the possible inclusion of co-authored materials in dissertations/theses must be discussed between the student and their advisor (and preferably with their advisory committee) as early as practical and no later than the time of the preliminary oral exam for doctoral students.
2. Students whose degree requires a dissertation/thesis must develop an Authorship Statement in consultation with their advisor(s) and their advisory committee. The Authorship Statement must be included in the dissertation/thesis after the List of Figures and before the first chapter. The statement must include the following
  - a. List of the chapters/sections/topics of the dissertation or thesis that result from collaborations and/or include contributions from others.

- b. For each identified chapter/section/topic: description of the student's role and the role of each contributor.
- c. For an identified chapter/section/topic corresponding to a manuscript in the publication process: a full citation of the article, including its status at the time of final approval (i.e., submitted, in revision, accepted, published). For work that is published at the time of dissertation/thesis submission: the necessary copyright authorizations for inclusion of previously published content.
- d. If the dissertation contains no original contribution from others—aside from those captured through citations and/or acknowledgements: a statement that the student is the sole author of the dissertation/thesis.
- e. A clear and thorough description of whether and how tools from Generative Artificial Intelligence were used, as per section 3.6.E of the Graduate School Handbook (p. 1).

Approval of the Authorship Statement by the advisory committee is a necessary condition for passing the final oral examination. The Chair/co-Chairs must certify the following statement on the exam form:

*The advisory committee reviewed the Authorship Statement provided in the dissertation or thesis and unanimously approved it.*

## Best practices

- Expectations regarding dissertation/thesis types should be clarified between the candidate and their advisor (and preferably their advisory committee) as early as practical. This includes whether and how contributions of the advisor and/or the advisory committee should be documented.
- Use an agreed upon contributor role taxonomy such as CRediT (<https://credit.niso.org/>).
- Co-authors/collaborators should be informed about the possible inclusion of their contributions in the candidate's dissertation/thesis; they should provide written statements agreeing to this (e.g., email messages). It should be understood and conveyed that the authorship on a dissertation chapter, which in many cases will be the basis for, but not necessarily the complete version of, a peer-reviewed paper, might differ from that on a later peer-reviewed publication.
- Written statements from publishers and/or co-authors agreeing to the inclusion of published or co-written materials in the candidate's dissertation/thesis should be included in the dissertation/thesis.
- The inclusion of the same article in the dissertation/thesis of more than one student needs special consideration. This situation is most likely to occur for students in the same research group in which case the advisor/s is/are expected to bring this to the advisory committee's attention. It is the role of the advisory committee to determine the appropriateness of such inclusions on a case-by-case basis.

<sup>1</sup> All doctoral students must attain candidacy for the degree within four years of starting their program or after they have completed 48 hours of coursework, whichever is later, see Graduate Handbook (<https://catalog.ncsu.edu/graduate/graduate-handbook/comprehensive-examinations/>).