Research Handbook

Vanderbilt Master of Genetic Counseling

(Current as of August 2024)

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I. INTRODUCTION

This handbook is intended to provide guidance to students towards successful completion of the Master of Genetic Counseling (MGC) thesis requirement. Research is a core component of the VU MGC program, and we aim for each student to complete a thesis that is skill-building and impactful.

A. DEGREE REQUIREMENTS

The VUSM MGC degree requirements, including the thesis requirements, are outlined in the VUSM Catalog at: Master of Genetic Counseling Degree Requirements (vanderbilt.edu)

B. RESEARCH PROGRESS AND ASSESSMENT

The MGC Research Progress Assessment Policy is found in the VUSM Catalog at: Master of Genetic Counseling Student Assessment (vanderbilt.edu)

C. RESEARCH REVIEW COMMITTEE

The MGC thesis requirement is administered by the Research Review Committee as described in the VUSM Catalog at: Master of Genetic Counseling Program Overview (vanderbilt.edu)

II. DIRECTLY RESPONSIBLE INDIVIDUALS

According to the VUSM MGC Student Handbook, Directly Responsible Individuals (DRIs) are defined as those program faculty with whom students should be in contact regarding questions or informational needs they might have. The primary contact for any issue should always be contacted first. In the event that the primary contact is not available, the second contact should be contacted next. If the second contact is not available, the third contact should be contacted.

The primary contact regarding issues with thesis projects is the student's Research Advisor.

Primary Contact	Research Advisor
Second Contact	RRC Liaison member
Third Contact	RRC Chair or Program Leadership

Table 1: Directly Responsible Individuals

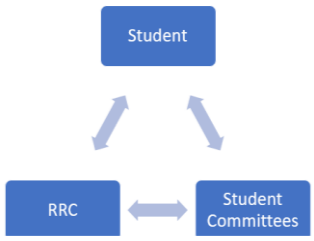

Figure 1. Communication

Communication is key to a successful research project. Unlike course work and clinical rotations, the student should take the lead in communicating and executing the research project. The student's committee and the RRC are available to provide guidance and accountability to motivate the student to meet the thesis requirements for graduation. The student must take ownership and continue to drive the project forward while communicating often and clearly with the RRC and their committee.

A. STUDENT

It is the responsibility of the student to complete the thesis project as outlined in their proposal under the guidance of their committee. Students are expected to be self- motivated and ask for help and guidance as needed. They are responsible for keeping ALL their committee members aware of their progress as it relates to their timeline. Students must be proactive and manage their time to ensure they meet the degree requirement deadlines. The burden and responsibility of communication begins with the student including scheduling the regular meetings as required.

Students are expected to hold ownership of the management of their projects. Recognizing that this can mean different things for different projects and different students, this may take different forms and should be negotiated at the outset with the advisor and committee. See suggestions for success at the end of this document.

B. STUDENT THESIS COMMITTEES

Student thesis committees are comprised of the following members:

- MGC Student- Leads the committee
- Thesis Advisor- Primary mentor for the research
- RRC Liaisons (RRCL)- represents the RRC for the student to the RRC and is the resource to the student to address questions about research process; RRCL encourages communication and holds the student accountable to the RRC process and degree requirement
- Faculty or Professional Member with content expertise- lends expertise
- Faculty or Professional Member to provide analytical support- lends analytical support
- Other members as needed for research topic- as assigned

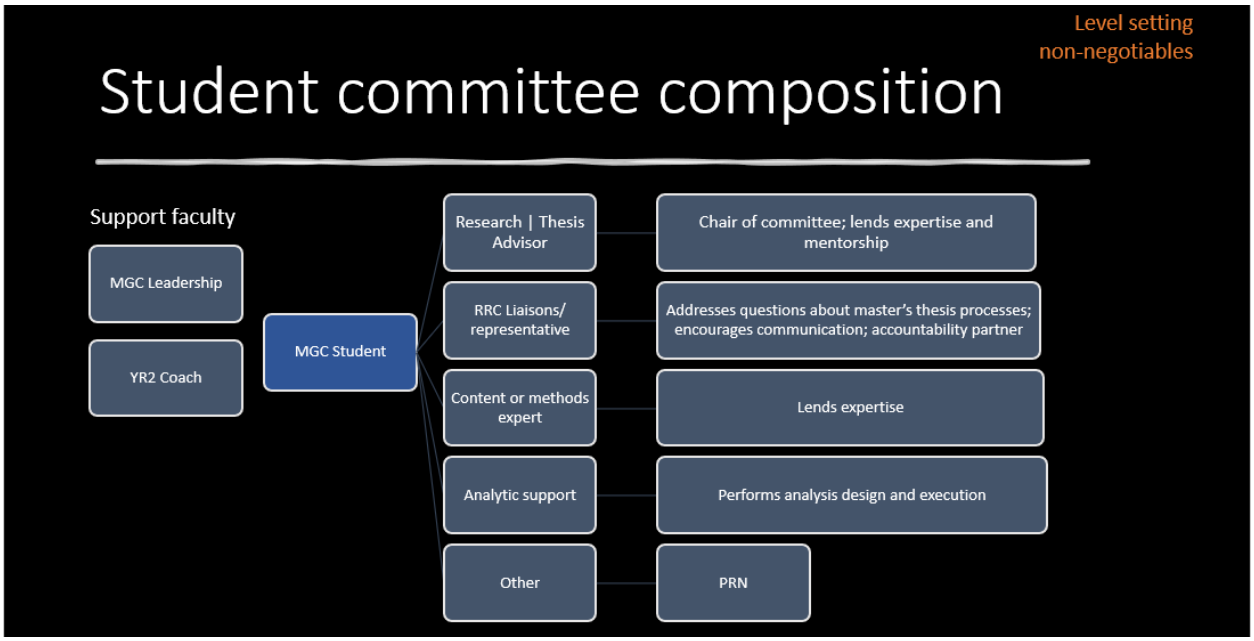

Figure 2

Thesis Advisors responsibilities are outlined in the Research Advisor agreement (See Appendix). Also, they should:

- Be available after accepting the student in Year 1, semester 1 to guide the development of the research aims.
- Be available to give students feedback on their work and progress; suggest background reading and other texts that will be important to the student's work.
- Iteratively read and provide feedback on the student's thesis proposal as it develops in year 1, semester 2.
- Identify events (journal clubs, conferences/meetings, educational events) that the student should participate in to gain knowledge related to the research project.
- Help the student identify the appropriate target journal for the thesis publication.
- Be available for bi-weekly meetings to ensure the student's project is on course or is adapted in a way that is productive (remotely or in person).
- Communicate with the RRC about any concerns during the thesis experience so that they may be addressed promptly, including attendance concerns.
- Provide funding beyond the $1000 provided by the MGC program if the advisor-proposed project requires additional funds.
- Provide funding for the publication of the student article submission, especially if associated with an NIH-funded project where open-access publishing is required.
- Provide iterative feedback on any presentation of the work, including for conferences and for student presentation of their thesis project in their coursework.

C. YEAR 2 COACH

One faculty member will be designated the "Year 2 Coach" for all 2nd year students. This individual will coordinate the monthly research workshops for the year 2 students and be the first point of contact for questions regarding resources for student resources outside of their committee. The year 2 coach will help students navigate the 2nd year timeline for the research requirement.

D. ASSESSMENT VERSUS COACHING

The School of Medicine provides the discussion and directive pertaining to Faculty/Educator Roles in the VUSM Catalog at: Faculty/Educator Roles (vanderbilt.edu)

The MGC program establishes policy for Managing Conflicting Roles in the VUSM Catalog at: Master of Genetic Counseling Student Support and Advisory Services (vanderbilt.edu)

To further clarify and align with both directives, the MGC program has determined that the RRC Chair and RRC Liaisons serve in Assessment roles. The Year 2 Coach, Research Advisor, Committee Members primarily serve in coaching roles. All faculty work together to support the student in meeting expectations. If students are not meeting expectation, faculty should speak with the student directly about the concern. If the issues are unresolved, faculty should inform the next DRI in the following order Research Advisor => RRC Liaison => RRC Chair => Program Director.

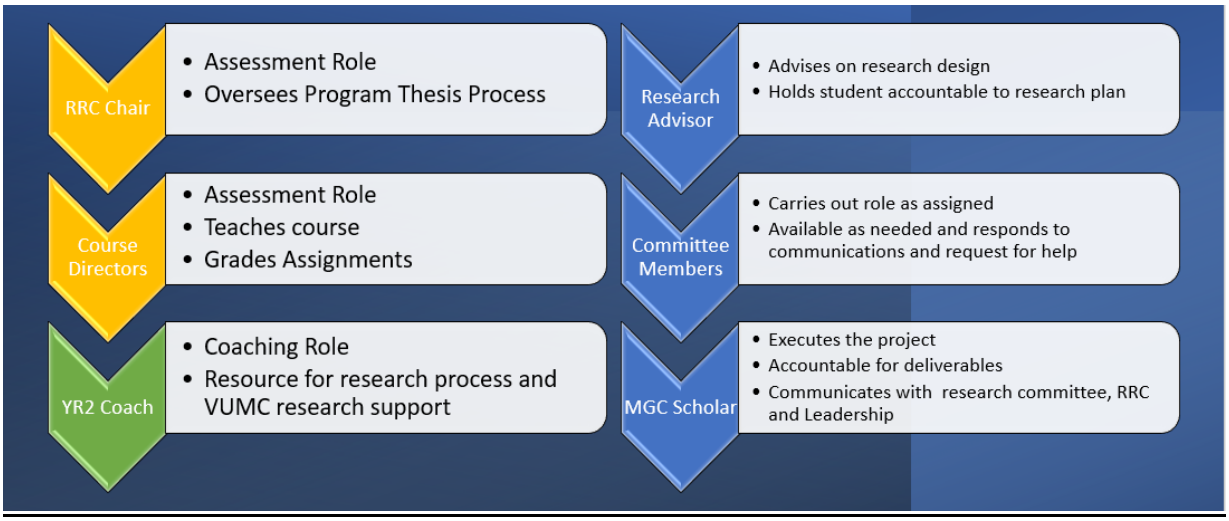

Figure 3

III. THESIS TIMELINE AND DELIVERABLES

A. THESIS TIMELINE

The dates listed here are general. Note that for Year 1, some dates correspond to due dates for Research for Genetic Counselors I and Research for Genetic Counselors II. Please see syllabi for specific dates.

If the student must deviate from the timeline (i.e., miss a date), the student must submit a formal request to the RRC explaining the circumstances, with an updated proposed timeline, ideally as soon as it is clear that a timeline deviation is needed, and each time the timeline must be adjusted. Thesis advisors should be in agreement with any updates to the timeline. RRC members will bring the proposed timeline to the leadership for approval.

Table 2: FIRST YEAR

Presentation of Potential Student Research Topics	Weeks 4 and 5 of Classes
First Literature Review Due	Fourth Week of October
Specific Aims + Student-Advisor Research Agreement Due	First Day of Fall Finals
Background & Significance Due	Third Week of March
Approach Due	First Week of April
Thesis Proposal Due	First Day of Spring Finals
IRB Submission	Before August 15th

Table 3: SECOND YEAR

Student Meets with RRC Member	First Week of August
Data Collection Complete	First Week of October
First Figure Complete	First week of November
Abstract and Manuscript Outline Complete	First Week of December
First Draft of Manuscript Submitted to Committee	Second week of February
Final Draft of Manuscript submitted to Committee	First Week of April
Submission of Abstract to NSGC Annual Conference	April 15th or as determined by NSGC (whichever is sooner)
RA + Committee Sign Off on Completion of Thesis	Last day of April

Figure 4 (below) provides an overall timeline for the research process with the directly responsible individuals.

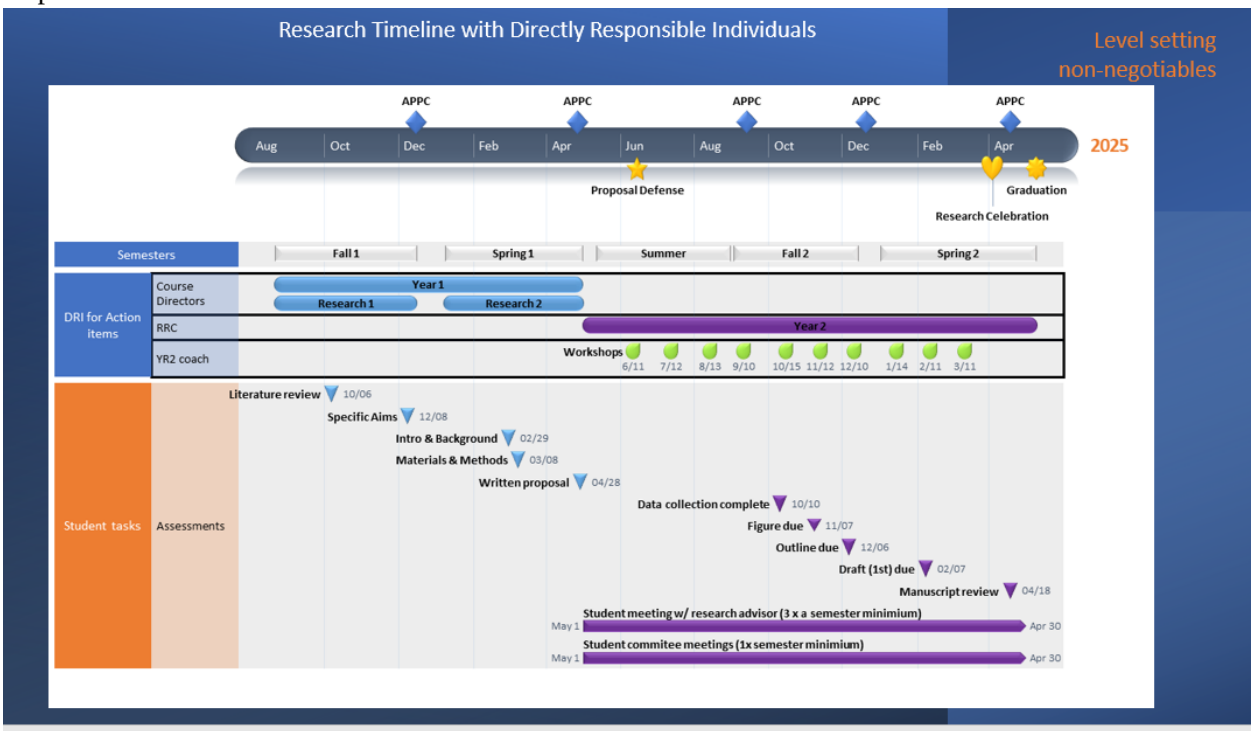

Figure 4

B. DELIVERABLES

1. Student Research Topics

During the first semester of the first year, potential Research Advisors will present ideas to the class. Students will select a Research Advisor and/or potential research question, which should be determined by November 1st.

2. Research Agreements

Once the student has matched with a Research Advisor, there are two agreements that are required to be signed: The Thesis Development Protocol and the Student-Research Advisor Agreement (both of which are located in the shared Research Box folder ("Master of Genetic Counseling | Research"). Once the student's Thesis Committee has been formed, a third agreement is required to be read and signed by each Committee Member (also located in the shared Research Box folder).

(Box → Master of Genetic Counseling | Research → Research Agreements)

3. Thesis Proposals

The student's final thesis proposal will be due at the end of the spring semester of the first year. See shared Box folder for the thesis proposal template and items to include. Please note that thesis proposals will include a student training plan section, which is outlined in the template. The shared Box folder also includes past thesis proposal presentations.

(Box → Master of Genetic Counseling | Research → Thesis Templates (Proposal + Presentation)
(Box → Master of Genetic Counseling | Research → Thesis Proposal Examples)

4. Thesis Proposal Presentation

- Each student will defend their thesis proposal to their thesis committee. These meetings are held on the 3rd Friday of May and the following Thursday of May with 4 students presenting each afternoon.
- Dates and times for student defense of their thesis proposal will be set by February 28th.
- Students will submit their written thesis proposals to their committee members one week prior to their proposal date.
- Thesis proposal presentations will last approximately 20 minutes with 10 minutes for questions/discussion.

Thesis Committee Members will provide feedback to the RRC by completing a REDCap form after the presentation. The RRC Liaison to the student's Thesis Committee will compile feedback from the REDCap survey and provide this to the student within one week following their presentation.

The RRC will then make a recommendation to the Academic Progress and Promotions Committee (APPC) and the student will be cc'd on the email. The potential outcomes of the thesis proposal presentations are:

- Approved to proceed
- Approved to proceed following specific revisions
- Not approved - reschedule the meeting for a subsequent presentation following major revisions (This outcome is highly unlikely given the preparation throughout the first year - only in rare circumstances where the proposed research is at significant risk of not being feasible given time or cost constraints, or deemed to be unethical, etc.)

Once an outcome has been determined, the student will then make a plan with their Research Advisor to address feedback and implement this into their final thesis proposal.

If a student is approved to proceed following specific revisions, they will work with their Research Advisor to implement these revisions. The student will send their updated, final thesis proposal to the RRC Liaison to the student's Thesis Committee. The RRC will then inform the Academic Progress and Promotions Committee (APPC) that approval to proceed has been given. The student will be cc'd on the email.

5. Student Training Plan

As a part of the thesis proposal, students should include a training plan including the following:

- At least 4 learning objectives for training
- A rough descriptor of the planned content
- A timeline for learning to be executed between May and September following acceptance of the student's thesis proposal by the Research Review Committee.

Possible training approaches include:

a. Completion of courses and workshops offered at Vanderbilt, such as self-paced scientific writing (https://medschool.vanderbilt.edu/bret/self-paced-scientific-writing-training/)
b. Completion of online coursework, such as:
    - Code Academy courses in coding (e.g. https://www.codecademy.com/learn/learn-r)
    - Coursera courses in survey research, qualitative data analysis (e.g. https://www.coursera.org/specializations/data-collection)
c. A guided reading plan with your thesis advisor and committee members to develop critical thinking in your topic area and methodology:
    - Provide a list of references (textbooks and/or primary literature) that you will read and discuss with your mentor and/or committee members.
    - Each session may count towards 2 hours of learning time, 1 hour for preparation and follow up and 1 hour of meeting time.
d. Attendance at seminars, lab meetings or conferences relevant to your topic.

Students can also mix and match models to create their own plan and innovate. The overall plan should amount to ~ 32 hours of active learning time. Courses taken as a part of the training plan may overlap with elective courses taken for credit, though are not required to do so.

Learning objectives should be written using Bloom's taxonomy.

All training plans must be approved by the student thesis advisor and RRC Liaison at the time of the thesis proposal presentation. If you propose to take an online course, specific course websites must be reviewed by both the thesis advisor and committee chair to verify appropriateness of the content and qualifications of the educators leading the course.

All certificates of completion must be saved and submitted to their RRC member upon completion of the training plan. For guided readings, provide a summary of material covered, with attestation by the thesis advisor that readings were completed. RRC member will then notify the RRC Chair that the Student Training Plan is completed.

6. Time Commitment in Year Towards Research

During the **summer semester of year 2** the students initiate their student training plan. It is expected that, throughout the summer and second year of the program, students will devote approximately 10 hours of time per week to their thesis work, in accordance with the course credit allotted to them. This includes time spent on the training plan, as well as work on actual thesis progress.

Recognizing that there is also a heavy clinic load through this time, negotiations may need to occur between students and clinical supervisors to make sure time is protected. Ideally, students will discuss these obligations at the start of their rotations and work with thesis advisors, rotation supervisors and program faculty when additional help is needed to find a good balance.

A student must be meeting expectations towards completion of their Student Training Plan to receive a passing grade for the research credits (GC7999) in the semester the work was assigned. If students are not meeting expectations, they will receive a grade of incomplete or fail depending on the determination of the Thesis Advisor's recommendation to the RRC Chair.

7. GC7999 Thesis Credit requirements

For the Summer, Fall and Spring Semester of Year 2 Students will take GC7999 credits towards the completion of their thesis requirement. To earn a passing grade for each of the semesters the student must:

- Meet regularly with Research Advisor and Committee as agreed upon
- Update the detailed timeline for completion of data collection
- Meet with the RRC member prior to the semester deadline to review the following:
    - Review of progress towards completion of the Thesis requirement including successes, challenges and anticipated delays
    - Updates to budget
    - Updates to thesis timeline

Additional deliverables for each semester are provided in Table 4. These deliverables can be adjusted by student with the approval of the Research Advisor and RRC Liaison.

Semester	Deliverables	Due date
Summer (2 credits)	Responses to any feedback received during the thesis proposal defense Approval of proposal with any required revisions Submission of IRB materials (where applicable) or adequate progress towards submission as approved by the RRC Chair Completion of training plan or adequate progress as approved by RRC Chair	August 15
Fall (3 credits)	Data collection (first week of October) Draft Figure 1 (first week of November) Draft Abstract and Outline of Manuscript (first week of December)	Dec 15
Spring (3 credits)	1st Draft of Manuscript (second week of February) 2nd Draft of Manuscript (second week of March) 3rd or final Draft of Manuscript (first week of April) Submission of Abstract to NSGC (April 15th or as determined by NSGC- whichever is sooner FINAL manuscript (April 30)	May 1

Table 4: Deliverables by semester for GC7999.

8. Grants/Funding

Funds in the amount of $500 per student are distributed to each student in the Spring of their first year. These funds are to be use for the student's project and travel related to research and training. If funding is required prior to the date the student may request from the Program Director early allocation of these funds. Additional funding ($500) is provided in the fall of year 2. These funds are expected to be used to defray travel related expenses for the NSGC Annual Conference in the fall of the second year. The student collaborates with his or her faculty RA and thesis committee to determine the most appropriate use of funding. Students are encouraged to apply for additional funding for research through grants offered by NSGC and other funding sources. Students should acknowledge this funding from the VUSM MGC degree program in all work products from their research included acknowledgement in publications, presentations or posters.

Students will also have the opportunity to apply for grants and funding. Common funding sources include:

- NSGC grants/funds - JEMF, SIG grants
- NIH - https://grants.nih.gov/grants/guide/rfa-files/RFA-HG-20-049.html#_Section_II._Award_1
- NIH administrative supplements to thesis advisor awards: Administrative Supplements | grants.nih.gov

Resources

Several resources are available to students as they navigate the research process. Some of those include:

- Library (http://www.library.vanderbilt.edu/biomedical/)
    - All MGC students have access and privileges to the Vanderbilt University Jean and Alexander Heard Library System, a system of eight on-VU campus library buildings, including the Eskind Family Biomedical Library and Learning Center

(EBL). Vanderbilt University's libraries are among the top research libraries in the nation, home to more than eight million items, including print publications, microfilm items, and digital collections.

- EBL collects and provides access to materials to support the teaching, research, and service missions of Vanderbilt University and Vanderbilt University Medical Center. EBL's comprehensive biomedical and health sciences collection consists of 15,000 print volumes and more than 20,000 electronic databases, journals, and books. The Interlibrary Loan/Document Delivery service can assist with finding and acquiring items not available in the Vanderbilt Library collection. Research assistance and instruction for current students, staff, and faculty is available in-person, or electronically through Skype for Business.
- Each student has access to numerous professional texts and journals through electronic Eskind Family Biomedical Library resources, a full Digital Library accessible with a VUNetID and password. These resources are accessible via the campus network, from workstations and circulating laptops in campus libraries, as well as via authenticated access (VUNetID and e-password) from off campus. The library has wireless network access throughout the facility, 12 desktop computers, six laptops available for checkout, two multi-function printers, and 3-D printing.
- During the MGC program orientation students are provided training about how to access library physical and online resources. In addition, periodic training sessions for students and faculty members provide information about online research techniques to enable the fullest access to available resources.

- Vanderbilt Writing Studio (www.vanderbilt.edu/writing)

9. Final Thesis/Manuscript Approval

The graduation requirement is a written manuscript ready to be submitted to the Journal of Genetic Counseling or another appropriate journal. At a minimum, it must be formatted for the target journal, with all the parts/components to be published. Thesis committee members must approve the final written manuscript. Students are not required to give an oral presentation of their thesis to their thesis committee, though they may invite their committee members to the final presentations of the thesis projects held close to graduation (aka VUSM MGC Research Symposium held in Spring). It is strongly recommended that students submit an abstract of their thesis for presentation at the annual meeting of the National Society of Genetic Counselor or other appropriate scientific meeting.

Some students may choose to participate in collaborative publications in which their thesis is one component of a larger publication. In this case, they must contribute to each part of the manuscript, but it may be acceptable for them to submit a manuscript for graduation with intentional gaps indicating where content from outside of their thesis will be integrated, with content generated by others outside of their thesis project, and/or as a smaller manuscript targeted at a narrower journal audience that removes references to content generated by others. In the case where collaborators' content is included, it is important to both do so with permission

of the collaborators and to acknowledge the source of that content to the committee at the time of submission, such that there is no appearance of plagiarism or impropriety.
Convention in the program is that Research Advisors will serve as the last author on all publications, with any committee members also being offered the opportunity for authorship. Corresponding authorship can be determined through discussions between the Student and the Research Advisor.

Standard practice is to offer authorship to all committee members on the resulting manuscript. Non-committee members may also be included if they make significant contributions to the student's work. The principles for defining authorship should follow the guidelines set forth by the International Committee of Medical Journal Editors (ICMJE) ICMJE | Recommendations | Roles and Responsibilities of Authors, Contributors, Reviewers, Editors, Publishers, and Owners, or equivalent guidelines in related fields (e.g., sociology, education). It is important to for the student to communicate with the research advisor about anyone meeting the first criterion for authorship, so that they may be offered the opportunity to meet criteria 2-4. It is often the case that you will be using datasets where others had significant involvement in study design and data generation, but you may not be working directly with those individuals on a regular basis, and thus may not know of their contribution to your work without advice from the advisor.

Authorship order should be discussed early and often with the thesis advisor, as authorship status can change as projects evolve and contributors differ. See also: 2003pdf12.pdf (publicationethics.org).

Authorship decisions should also be made in accordance with all applicable VU and VUMC policies, as relevant. For instance, use of the biostatistics core may result in necessitating inclusion of statistical author(s), in accordance with policies set forth by the VUMC Department of Biostatistics: ManuscriptPolicies < Main < Vanderbilt Biostatistics Wiki (vumc.org)

Suggestions for successful project management:

- Determining your advisors preferred communication means (e.g., via email, slack, phone, utilizing an administrative assistant, etc.)
- Scheduling regular meetings with your thesis advisor (biweekly is ideal) and leading the scheduling and management of the meetings
- Setting an agenda for each meeting and sending out prior to the meeting
- Following up with notes or minutes from each meeting with action items highlighted, including tracking action items for the advisor
- Discussing any additional funding availability or budget needs beyond the provided student funds
- Reviewing your aims (Year 1, Semester 1) and proposal (Year 1, Semester 2) during development with your thesis advisor, to ensure they can be feasibly completed as part of their research program
- Keeping track of your timeline and notifying advisors of any deviations from your expected timelines
- Reaching out for help when you need it

APPENDIX

I. Research Agreements
   i. Protocol for Thesis Progress and Completion
   ii. Student-Advisor Research Agreement
   iii. Thesis Committee Agreement

II. Resources
   i. Vanderbilt Stats
   ii. MGC Thesis - Research Funding Notes
   iii. 2023-10-10_Statistical Analyses_Rutgers_GCMP.pdf

III. Publication guidelines—coming soon

IV. Poster templates and printing—coming soon