# Table of Contents

**Part I: Graduate Degree Information**
- Introduction ............................................................... 2
- Being a Graduate Student .................................................. 3
- The Graduate Student Activity Monitoring System ([https://mth-grad.cst.cmich.edu](https://mth-grad.cst.cmich.edu)) ........................................... 4
- The Role of the Academic Advisor ...................................... 4
- Transferring from the M.A. to the Ph.D. ................................. 5
- Transferring from the Ph.D. to the M.A. .................................. 5
- Guideline for reclassification from conditional admission to regular admission .................................................. 5
- RCR Training ...................................................................... 6
- The Role of the Research Advisor ........................................ 6
- The Role of the Thesis/Dissertation Committee ...................... 6
- Guidelines for Plan B Papers for the M.A. in Mathematics .......... 7
- Guidelines for Master’s Thesis for the M.A. in Mathematics .......... 8
- Ph.D. Qualifying Examination Policy .................................... 9
- Timeline for Taking/Passing Qualifying Exams ......................... 10
- Guideline for Appealing Failure of Meeting Exam Deadline .......... 10
- Guidelines for Ph.D. Dissertation ........................................ 11
- Internship Application Policy ............................................. 12
- Internship Portfolio .......................................................... 12
- Independent Study Policy ................................................... 13
- Time Required for Completion of Degree ............................... 14
- Graduate Teaching Assistantships ...................................... 14
- Stipend and Tuition Benefits ............................................. 14
- Graduate Research Assistantships ....................................... 14
- Graduate Fellowships ....................................................... 15
- Policy on Reappointment of Graduate Assistantship ................ 15
- Criteria for Evaluation of Graduate Students .......................... 15
- Additional Funding Opportunities ......................................... 18

**Part II: Timeline of Activities and Tasks** .................................. 19

**Part III: Important Information from the Department** .................. 21

**Part IV: Graduate Teaching Assistant Information** ...................... 24
- Introduction ..................................................................... 25
- Your Responsibilities ....................................................... 25
- Syllabus Example - MTH 105: Intermediate Algebra ................. 28
- Additional Remarks and Helpful Suggestions .......................... 29
- Tutoring Opportunities (Student Support Services) ................... 31
- Other Guidelines ............................................................ 32

**Part V: Appendix** ........................................................................ 34
- Appendix A: Instruction for accessing mth-grad.cst.cmich.edu site .................................................. 34
- Appendix B: Instruction for RCR Training ............................... 36
- Appendix C: Forms from Graduate College ......................... 39
- Appendix D: Course Waiver Form ....................................... 40
- Appendix E: Reference for Planning Ph.D. Coursework ............... 41
Part I: Graduate Degree Information

Guidelines and Policies*

If you have any questions or need further information contact the Department of Mathematics or Graduate Coordinator:

Mathematics Department Office: Graduate Coordinator for 2014-2016
Office location: PE 214 Dr. Carl Lee
Office phone: 774-3596 Office location: PE 109
E-mail: mthgrad@cmich.edu Office phone: 774-3555
Fax: 774-2414 E-mail: carl.lee@cmich.edu

* Any exceptions to the guidelines and policies in Part I of this graduate handbook may be granted by the Graduate Committee of the Department of Mathematics.
Introduction

The Department of Mathematics offers the Graduate Certificate Program in Data Mining (D.M.), the Master of Arts in Mathematics (M.A. in Math), and the Ph.D. in Mathematics with a Concentration in the Teaching of College Mathematics.

- The Graduate certificate program in Data Mining at Central Michigan University is a one-year program designed to give students a comprehensive training in basic foundation, advanced knowledge and applications of data mining. The program is suitable for students in diverse disciplines who want to extend their knowledge and skills in data analytics.
- The M.A. degree program is a two-year program that has the flexibility to prepare students for jobs in industry and government, or for teaching mathematics at the undergraduate level, or to undertake doctoral work in mathematics.
- The Ph.D. degree is a content-based degree designed to develop well-prepared teachers of college mathematics who combine knowledge and skill in mathematics with a desire to teach it effectively. Coursework is broadly distributed across the various areas of mathematics, mathematics education and statistics. It is intended to help students achieve a level of sophistication in mathematical knowledge that will establish a professional attitude about mathematics. Emphasis on pedagogy includes two required courses in mathematics education plus a year-long internship.

The department has active faculty with particular research strengths in the areas of algebraic geometry, applied mathematics, approximation theory, combinatorics and graph theory, differential geometry, functional analysis and operator theory, number theory, mathematics education, and statistics. Ph.D. students may choose to write dissertations in mathematics, applied mathematics, statistics, or collegiate mathematics education.

Classes are small, allowing students to receive individual attention. An active colloquium program draws speakers with varied research interests from a wide range of locales. Graduate student seminars give students the opportunity to explore topics that extend beyond the required coursework. Research groups have strong links with science and engineering departments within Central Michigan University, other universities, and industry. Statistical consulting center gives students opportunities to analyze data of applied research projects from many different disciplines at CMU and/or external agencies.

Computing facilities within Pearce Hall, where the department is located, include two teaching laboratories with Macintosh and PC computers on 4th floor and a research computer lab on 2nd floor.

Being a Graduate Student

What does it mean to be a graduate student? In general, there are two main facets of graduate student life. The first is the role of being a student. Since the pursuit of a graduate degree requires dedication to the ideal that learning is a life-long endeavor, a graduate student is expected to place academic scholarship above other aspects of life.

The second facet of most graduate students’ lives is that of teaching. Since most of our graduate students teach as Graduate Teaching Assistants, they work closely with undergraduate students; which occupies a significant amount of their time. Duties related to this work include: preparing lessons, teaching classes, office hours, tutoring in the Mathematics Assistance Center, responding to student phone calls and/or e-mails, grading, and reflecting on teaching. For our Ph.D. students this philosophy is particularly important since a major objective of the Ph.D. program is designed to prepare graduate students to take
positions in academia at primarily teaching institutions. It is the balance of scholarship and teaching that can prove to be a challenge to many beginning teaching assistants.

Besides academic work and teaching/research duties, the life of being a graduate student should also include social and networking activities at personal and professional level. Mathematics department has a Graduate Student Chapter of the American Mathematical Society and several student clubs that are available for both undergraduate and graduate students, including Kappa Mu Epsilon, a chapter of the national Math Honor Society, Gamm Iota Sigma (GIS) chapter of the national scholastic insurance fraternity, and Statistics Club.

The Graduate Student Activities Monitoring Online System (See Appendix A for Instruction)
https://mth-grad.cst.cmich.edu

Starting from the first semester of your graduate student life, your most important duty is to study and have a successful academic performance. The department provides a variety of administrative assistance to help you succeed. Your academic progress and activities are monitored through an online database at https://mth-grad.cst.cmich.edu. As a new a student, you will receive an e-mail to inform you your ID and PW for accessing this online database once you are registered by the Mathematics Department. The ID is your CMU’s Global ID (e.g., johnd.1w). This online system consists of your CMU’s academic information, the Advising Worksheet and a variety of survey instruments that you will be asked to complete at a certain time period, such as ’sign-up for taking qualifying exam’, ‘funding renewal survey’, ‘Internship Applications’, etc. See Appendix A for further details.

The Role of the Academic Advisor

When a graduate student is admitted to a program they are assigned an academic advisor. The academic advisor will be available to help throughout your program of study. The main role of the academic advisor includes:

- Provide advising on course work planning throughout the student’s studying period.
  Each graduate student must submit a two-year plan of study completed in consultation with and approved by his or her advisor every fall semester by completing the on-line Advising Worksheet on the Graduate Student Online Monitoring System at https://mth-grad.cst.cmich.edu. This Worksheet consists of each student’s academic course work and performance. At the beginning of every semester, each student will update the Worksheet and meet with the advisor to approve the Worksheet.
  For Ph.D. students, the academic advisor will be changed to the dissertation advisor when a student successfully completes the required qualifying exams and chooses the dissertation advisor. For M.A. students, the academic advisor will be changed to the thesis advisor (if a student chooses to do a Plan A). There is no change of advisor for students who chooses to do Plan B papers.
- Approve the Authorization of Graduate Degree Form.
  This form is required for auditing of completion of coursework. This form can be downloaded from http://www.grad.cmich.edu, which will list all the requirements a student need to complete in order to earn a degree. Each student is required to complete the form and meet with the academic advisor to approve it prior to sending it to the Office of Research & Graduate Studies. For M.A./D.M. students, this form should be completed early during the semester of graduation or the semester prior to graduation.
  For Ph.D. students, this form should be completed at least one semester prior to the dissertation defense.
• Various requests made by students will also need the advisor’s approval, including:
  o Requesting an independent study that are used to substitute for a regular course.
  o Reclassification from conditional admission to regular admission.
  o Providing advising if a student is on an academic probation.
  o Requesting for Internship.

**Transferring from M.A. to Ph.D.**

There is no direct transfer from M.A. to Ph.D. in the Department of Mathematics. If a student in the M.A. program is interested in the Ph.D. program, s/he is required to go through the same admission and financial support application process as students from external institutions. **The student must reapply and compete with new applicants for funding for the following academic year.**

The student should have completed at least two semesters in the M.A. program prior to considering applying for admission to the Ph.D. program. A decision on which courses from the M.A. can be counted towards the Ph.D. will be made by the student’s advisor in consultation with the Graduate Coordinator. The number of credit hours that are transferred does not affect the total number of credit hours needed to earn a Ph.D. degree.

**Transferring from Ph.D. to M.A.**

In cases when a student decides to transfer from Ph.D. program to M.A. in Mathematics, s/he needs to inform their academic advisor and the Graduate Coordinator, and follow the following steps to complete the transfer.

1. The student must inform Graduate Student Services via e-mail stating that s/he will be applying to the M.A. in Mathematics and withdrawing from the Ph.D. in Mathematics. The email should be sent to the appropriate specialist:

<table>
<thead>
<tr>
<th>GRADUATE STUDENT SERVICES STAFF:</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURTER</td>
</tr>
<tr>
<td>BLOOM</td>
</tr>
<tr>
<td>OUILLETTE</td>
</tr>
<tr>
<td>NOVAK</td>
</tr>
</tbody>
</table>

2. The student must apply to the M.A. in Mathematics via the website: apply.cmich.edu. Students will NOT have to pay application fee nor will they have to submit any documents other than the application.

3. A staff member in Graduate Student Services will send a new evaluation form to the Graduate Coordinator/Program Director to sign off on approving the transfer from Ph.D. to M.A.. *(An evaluation packet will NOT be sent with the evaluation form as the student was previously admitted.)*

4. Once the evaluation has been completed and returned to the staff member the student will be withdrawn from the Ph.D. program and admitted to the M.A. program and a new letter of admission will be sent to the student.

**Guidelines for Reclassification from Conditional Admission to Regular Admission**

From time to time, some students are offered conditional admission, instead of regular admission. These students are required to successfully complete either the language requirement, or pre-requisite courses or some graduate level courses. These students are required to consult with their academic advisor to sign up for these courses during their first year at CMU. Once the courses are successfully completed, students
must complete the **Reclassification Form, which is available in the Department Office**, and get approval from the academic advisor and the Department Chair to reclassify from conditional admission to regular admission. The student should also inform the Graduate Coordinator about the reclassification.

**RCR Training**

Graduate students in the master’s program must complete Responsible Conduct of Research (RCR) training by the **end of their third semester** in the program. Graduate Students in Ph.D. program must complete RCR training **no later than one semester after completing all the Ph.D. qualifying exams**. Students will be ineligible to register for thesis, dissertation or plan B credits until they have completed the RCR training. In addition, students awarded Research Assistantships must complete the RCR training before the start of their assistantships.

RCR training is through the website: [www.citiprogram.org](http://www.citiprogram.org). Procedure for the RCR Training is given in Appendix B.

Any first time user must register, and choose an ID and password. Upon completion, print the confirmation form and bring it to the Mathematics Department Secretary for recording.

**The Role of the Research Advisor**

A research advisor is a graduate faculty member selected by a graduate student based on their academic area of interest. You should select a research advisor as soon as you decide on your area of research interest. Your research advisor will guide you throughout the entire process of Plan B/thesis/dissertation research and writing.

*For the Plan B Paper:*

- Your research advisor advises you and oversees the completion of the paper.

*For the Thesis/Dissertation Paper:*

- Your research advisor helps you to form a thesis/dissertation committee.
- Your research advisor chairs the thesis/dissertation committee.
- Your research advisor schedules the final oral examination in which you will defend your thesis/dissertation.
- Your research advisor advises you and oversees the completion of final revisions to the thesis/dissertation.

**The Role of the Thesis/Dissertation Committee**

In consultation with your supervisor, you will form a thesis/dissertation committee. The approval of each committee member on both the prospectus (see forms section) and the thesis/dissertation is required.

- The committee may make suggestions for revising the prospectus.
- The committee may make suggestions for revising the thesis/dissertation.
- The committee conducts the final oral examination.
The committee determines whether the student passes the oral examination.

The committee members should receive a copy of the thesis/dissertation before the date of the final oral examination. Adequate time (suggested amount of time is at least two weeks) should be given to committee members for reading the thesis/dissertation.

**Guidelines for Plan B Papers for the M.A. in Mathematics**

This section describes the non-thesis Plan B option for the Master of Arts (M.A.) degree in Mathematics. The Plan B option requires six credits hours as described below:

- Students must complete two Plan B papers; each one under the direction of a graduate faculty member. For each Plan B paper, students must enroll in one credit of MTH 698.
- Students must register for a one-credit hour of Graduate Student Seminar (MTH 693).
- Students must complete an elective course at 500 level or higher approved by the academic advisor.
- If a master’s student passes a Ph.D. qualifying exam, it may count as a Plan B paper.

**Procedure for signing up a Plan B option**

After the student has selected his/her Plan B supervisor and the student and supervisor have jointly decided on the project, the student must fill out a proposal for each Plan B paper and file it in the department office.

**Proposal**

Each proposal must consist of:

- A statement indicating the aim of the project.
- A short description of the project.
- A bibliography containing at least two references relating to the topic.
- The signatures of the student and of the graduate faculty supervisor.

**Time Limit**

The Plan B paper should be completed during the semester for which the student is enrolled in MTH 698. A presentation of the Plan B results should be given during the graduate student seminar.

**Guidelines**

The purpose of the Plan B paper is to allow the student an opportunity to go beyond the normally expected coursework by presenting significant evidence of scholarship and/or creative activity in one of the following areas:

- Actuarial Science
- Algebra
- Analysis
- Applied Mathematics
- Combinatorics
- Computer Science
- Geometry-Topology
The topic will usually involve extensions or applications of material learned in class. The topic does not necessarily have to lead to new results and may be expository in nature, but it should require a significant amount of work on the part of the student. Students are expected to spend at least three hours per week working on the project during the semester they are enrolled in MTH 698.

Appropriate topics will vary depending on the subject matter area, but some possibilities include:

- A solution of a reasonably challenging but “do-able” problem, perhaps from a journal
- A computer simulation design
- An investigation of a topic in mathematics education
- An analysis of a “real world” problem
- An exposition of a theory or a collection of results

Completion of Plan B

Once a student completes the requirement of Plan B option, the student must complete the ‘Plan B Completion Approval Form’ and submit the original to the Office of Research & Graduate Studies and a copy to the Department of Mathematics. This form can be downloaded from [https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSAplicationsandForms/Pages/A-Z_Listing.aspx](https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSAplicationsandForms/Pages/A-Z_Listing.aspx), look for the ‘Plan B Completion Sign-off’ form.

Guidelines for Master’s Thesis (Plan A) for M.A. in Mathematics

Thesis Committee

The thesis (Plan A) committee must consist of a total of three faculty members, chaired by the student’s thesis supervisor. It is the responsibility of the student to select the committee members in consultation with the thesis supervisor. All members of the committee must be graduate faculty at Central Michigan University. One member of the committee may be from outside the area of specialization or department.

After the committee has been selected and the thesis topic has been chosen, a Thesis Prospectus must be filed in the Office of Research & Graduate Studies before the work is formally initiated (the form can be downloaded from [https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSAplicationsandForms/Pages/A-Z_Listing.aspx](https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSAplicationsandForms/Pages/A-Z_Listing.aspx), look for the ‘Prospectus’ form. At the same time, the Mathematics Department also requires a more detailed proposal to be submitted to the department office, with the approval of the committee members.

Proposal

The proposal shall consist of:
• A statement indicating the aim of the project.
• A short description of the project.
• A bibliography containing at least three references related to the topic.
• A timetable describing the different stages of the project including tentative dates of completion.
• Signatures of all the committee members approving the above.

The length of the proposal should not exceed three pages. A copy of the approved proposal must be submitted to the department office.

Time Limit

At the direction of the thesis supervisor, the student may take as many as three semesters to complete the thesis. The candidate may enroll for all or part of Math 798 during any semester or summer session (the maximum number of credit hours in Math 798 is six.) The candidate will receive a grade (credit or no credit) in Math 798 only on satisfactory completion of the entire six hours and its acceptance by the committee. A “Z” grade will be recorded in Math 798 until the final grade is assigned.

Thesis Defense

There will be an oral examination covering the student’s thesis topic. The examination will be conducted by the student’s thesis committee in a colloquium format. The examination must take place at least four weeks prior to the student’s graduation date.

Completion of Plan A

Once a student completes the requirement of Plan A option, the student must complete the ‘Plan A Completion Approval Form’, and submit the original to the Office of Research & Graduate Studies and a copy to the Department of Mathematics. This form can be downloaded from https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSApplicationsandForms/Pages/A-Z_Listing.aspx. look for the ‘Plan A Completion Sign-off’ form.

Ph.D. Qualifying Examination Policy

In the Ph.D. qualifying examinations, students are expected to demonstrate a broad knowledge of the topic, be able to integrate mathematical concepts and explain them at an appropriate level. Qualifying Examinations will be offered in the following areas, based on the material in the courses listed.

1. Algebra (MTH 623, 625)
2. Analysis (MTH 632, 636)
3. Applied Mathematics (MTH 520 or 586, 638)
4. Applied Statistics (STA 590, 682)
5. Combinatorics (MTH 578, 678)
6. Mathematics Education (MTH 761, 762)
7. Theoretical Statistics (STA 584, 684)
8. Topology (MTH 644, 645)

Each doctoral student must pass three examinations in three different areas from those listed above.

• Students planning to write a dissertation in pure or applied mathematics must pass examinations in algebra, analysis, and one other area listed above.
• Students planning to write a dissertation in statistics must pass examinations in theoretical statistics, applied statistics, and analysis.
• Students planning to write a dissertation in mathematics education must pass examinations in mathematics education and two other areas listed above, at least one of which must be algebra or analysis.
• If a student decides to change the area of research after completing the three qualifying exams from an area, whether the student is required to take the additional qualifying exams for the new area will be determined by the faculty in the new area in consultation with the student’s dissertation advisor.

Timeline for taking/passing qualifying exams

Examinations will be offered twice a year, at the beginning of the fall term (in August/September) and at the beginning of the spring term (in January). Each examination will be prepared and graded by at least two graduate faculty members in the area of examination. The format of the exam for each student will be determined by the Graduate Committee in consultation with members of the examination committee from that area.

The student will be asked to sign up for one or more examinations on the https://mth-grad.cst.cmich.edu site by the middle of March for the August/September examinations and by the middle of October for the January examinations. The Graduate Committee will announce the examination committee within two weeks after the sign-up deadline.

Students are strongly encouraged to take the examinations as soon as possible.
• Full-time students who entered the Ph.D. program with a bachelor degree must pass at least one examination before the end of their fifth semester (fourth semester, for students with a master's degree in mathematics or statistics),
• Full-time students who entered the Ph.D. program with a bachelor degree must have passed all three qualifying exams before the end of their eighth semester (sixth semester, for students with a master's degree in mathematics or statistics).
• For example, a student with a bachelor’s degree entering the program in Fall 2014 must pass at least one exam before or during the examinations offered in August, 2016 (January 2016 for those entering with a master's), and have passed all three exams before or during the examinations offered in January 2018 (January 2017 for those entering with a master's degree).
• Part-time students may request additional time from the department.
• A maximum of three attempts in each exam are allowed. A third failure in one area eliminates a student from the Ph.D. Program.

The examination committee will assign an overall grade of pass or fail for each student and will report to the Graduate Committee its recommendations. The Graduate Committee will inform the student, in writing, the results of the Qualifying Examination and its decision within three weeks after the exams.

Guideline for Appealing

Students who do not meet the exam deadlines must appeal to the graduate committee in order to remain in the Ph.D. program. The appeal must include a timeline for completion of all remaining exams. A letter of support from a faculty member is required for those students who do not meet the eight (or six) semester deadline, and is recommended for all appeals. Students who exceed the timeline determined through the appeal process are automatically eliminated from the Ph.D. Program.
If a student is unable to take his/her qualifying examination at the scheduled time due to serious illness or emergency, the student must contact the Graduate Coordinator prior to the examination. The Graduate Coordinator will decide based on the evidence whether to make alternate arrangements. If the Graduate Coordinator is not available, the Department Chair or the Assistant Chair should be contacted.

**Can MA students take Ph.D. qualifying Exams?**

Students in the M.A. program may attempt any of the qualifying exams any number of times. They may only take the exams as scheduled for the doctoral program. If a master’s student passes a qualifying exam, it may count as a Plan B project and can carry forward as a passed exam if they choose to continue in the doctoral program. If a master’s student does not pass a qualifying exam, it will not be considered as a failed attempt should they continue in the doctoral program.

Note that in order to count the analysis examination as a Plan B project, a student must also earn elective credit in either MTH 633 or MTH 637.

**Formation of Committee**

Upon successful completion of the qualifying examinations, the student will select a dissertation supervisor. A dissertation supervisor must be a graduate faculty member in the Mathematics Department. The student will form a dissertation committee in consultation with the dissertation supervisor(s). This dissertation committee will be chaired by the supervisor(s) and must include at least two other graduate faculty members. Two members of the dissertation committee must be from the Mathematics Department, and members from outside the Mathematics Department cannot serve as co-chairs. A completed doctoral dissertation must be approved by the dissertation committee and by the Office of Research & Graduate Studies.

**Guidelines for Ph.D. Dissertation**

Students are required to register for 15 hours of MTH 898 (Dissertation). The dissertation must consist of original work and can combine scholarly, analytical, creative and expository skills. It could consist of research on a topic in mathematics or statistics, an expository or historical examination of a piece of mathematics, or research on a topic related to the teaching of collegiate mathematics. Before starting the dissertation work, the project to be undertaken must be approved by the dissertation committee and the Dean of the Office of Research & Graduate Studies. If human subjects, animals, or recombinant DNA are involved, the student must receive approval from the appropriate committee.

Verification of such approval is demonstrated by the completion of a Dissertation Prospectus, which can be downloaded from https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSApplicationsandForms/Pages/A-Z_Listing.aspx, look for the ‘Prospectus’ form. The department requires that a student whose dissertation work doesn’t involve human subjects, animals or recombinant DNA submit his/her prospectus within one year after completing qualifying exams.

Upon completion of coursework, qualifying examinations, the internship, and the dissertation, the candidate for the Ph.D. degree must pass a final oral examination, which is a dissertation defense in a colloquium format. The student's dissertation committee determines whether the student passes the examination.

**Preparation and Completion of Dissertation**

The dissertation must be prepared according to the regulations prescribed in the Office of Research & Graduate Studies’ most recent edition of the “Guidelines for the Preparation of Theses, Doctoral Projects,”
and Dissertations”, which can be downloaded from https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSApplicationsandForms/Pages/A-Z_Listing.aspx, look for the “Guidelines for the Preparation of Theses, Doctoral Projects, and Dissertations”. The final copy of the dissertation must be submitted to the Office of Research & Graduate Studies and to Dissertations Abstracts International. The checklist and forms can be found at http://www.grad.cmich.edu.

Once a student passes the dissertation defense and approved by the dissertation committee members, students must submit the ‘Dissertation/Doctoral Project/Journal Article Completion Approval Form’ signed by every committee member and Department Chair. This form can be downloaded from https://www.cmich.edu/colleges/cgs/GSNewandCurrentStudents/GSApplicationsandForms/Pages/A-Z_Listing.aspx, look for the “Dissertation/Doctoral Project/Journal Article Completion Approval Form”.

**Internship Application Policy for Ph.D. students**

The internship is designed to give practical experience in the teaching of undergraduate mathematics or statistics courses 200 level or above, excluding 500 level courses. For courses lower than 200 level, MTH 133, MTH 151, MTH 152 and MTH 175 can also be requested.

- Pre-requisite for teaching internship application: Passing all three qualifying exams, and have taken MTH 761.
- Students are required to intern in two different courses with two different faculty members.
- Students may not intern during the summer.
- Students cannot intern in two courses during one semester.
- Students cannot intern in two courses with substantial overlap of content, such as STA 282QR and STA 382QR.

**Procedure for applying for teaching internship:**

An e-mail message will be sent to inform all students the online application form located at the https://mth-grad.cst.cmich.edu in early March (for fall semester application) and in September/October (for spring semester application).

If you have completed the pre-requisites, then,

- find the course you plan to teach.
- consult with your academic advisor about your choice and his/her agreement.
- talk to the instructor to receive his/her agreement to supervise your teaching internship.
- go to the online application site to complete the form before the deadline.
- send the form to the course supervisor for comments and approval.

The application form approved by the course supervisor and the academic advisor will be reviewed by the graduate committee members and the graduate coordinator for final approval.

**Internship Portfolio**

The internship is viewed as a capstone experience for the teaching methods acquired during MTH 761. Upon completion of each internship experience, the student will submit a portfolio to the department office within two weeks of completion of the internship. It is intended that creation of the portfolio provide the student with an opportunity to reflect upon the teaching experience. The portfolio may also
aid the student in career advancement beyond the doctoral degree. The following items that reflect the teaching methods discussed in MTH 761 are the minimum requirements to be included in the portfolio.

a. A copy of the syllabus from the course being used for the internship.

b. A summary of different pedagogical methods used in the class giving examples of each type.

c. A sample of lesson plans on topics explored with technology or other non-lecture pedagogy; a brief discussion of what happened when the lesson plan was implemented in the classroom; a discussion of the successes and failures of the lesson plan and why they occurred; and a discussion of what the graduate student would do differently if they used this lesson plan again.

d. A brief discussion of expectations held about the students in the course and a comparison to how the students met or did not meet the expectations during the semester.

e. A discussion of various assessment strategies used, and anonymous copies of student work from each type to be included.

The portfolio will be evaluated by the graduate faculty supervisor in consultation with a Mathematics Education Area member if needed (preferably the MTH 761 instructor.) The portfolio is required for the completion of the internship.

**Independent Study Policy**

(A) If the independent study topic is related to your research work and not part of a regular course, the course number is MTH/STAT 597, 697 or 797. The following is the procedure to sign up for the independent study course:

1. Find a faculty who is willing to give the independent study.
2. Ask the faculty to send an e-mail to the department secretary and you stating (i) the faculty member agrees to offer the independent study, (ii) include the topic (e.g., related to dissertation/thesis, Multivariate Statistical Methods), and (iii) ask the department secretary to register you for the course.

(B) For courses other than those described in (A), these are regular courses and should not be offered as MTH/STA 597, 697 or 797. For example, student should not sign up for MTH 632 as MTH 697. Any regularly scheduled course like MTH 632 can only be taken as an Independent Study with prior approval of the Graduate Committee. The following is the procedure to sign up for such an independent study:

1. Consult with your academic advisor and have your advisor approve your request.
2. Find a faculty (hereafter referred to as Instructor) who has taught the course before and is willing to give you the independent study.
3. Go to the [https://mth-grad.cst.cmich.edu](https://mth-grad.cst.cmich.edu) site to complete the Independent Study Request Form. Send an e-mail to notify your academic advisor, the instructor and the graduate coordinator that you have completed the request form.
4. The request form will be automatically forwarded to your academic advisor and the instructor for their approval. Notify your academic advisor, and the instructor, and ask them to approve the form.
5. Upon their approval, the request form will be automatically forwarded to the graduate coordinator for final approval.
6. The graduate coordinator will either approve the request and inform the graduate committee members or bring the request to graduate committee meeting for discussion.
7. Once the decision is made, the Graduate Coordinator will inform the academic advisor, instructor, student and department secretary.
8. If the request is denied, student can appeal to the Chair of the department within one week of such a decision.
**Time for Completion of Degree**

Students are expected to complete all degree requirements in a timely manner. Coursework and other requirements must be completed within the following time limits:

a. Within seven years prior to the award of a master’s degree.
b. Within eight years prior to the award of a doctoral degree if the student had a relevant graduate degree when beginning the program.
c. Within ten years prior to the award of a doctoral degree if the student began doctoral study without a prior relevant graduate degree.

**Graduate Teaching Assistantships**

The department has teaching assistantships available for students in the graduate program. Graduate Teaching Assistantships are awarded on a competitive basis.

Graduate Teaching Assistants (GTAs) normally teach two sections of Beginning Algebra (MTH 055) or Intermediate Algebra (MTH 105) per semester. These courses have a supervisor whose responsibilities include:

- Preparing a course-pack for MTH 055 and MTH 105.
- Writing all tests for MTH 055 and MTH 105.
- Holding regular meetings to discuss issues related to the instruction of MTH 055 and MTH 105.
- Supervising the teaching of Graduate Teaching Assistants.

Experienced GTAs may teach courses other than MTH 055 and MTH 105. During the summer sessions, Graduate Teaching Assistants normally provide tutoring for students in lower-level mathematics courses or assist a faculty member with a research project or with grading. Detailed descriptions of teaching policies are in Part II of this handbook.

**Stipend and Tuition Benefits**

For information regarding stipend and tuition benefits for graduate teaching assistants, please refer to the agreement between CMU and the graduate student union at [http://www.fps.cmich.edu](http://www.fps.cmich.edu) or contact Faculty Personnel Services.

**Graduate Research Assistantships**

The department has a number of Doctoral Research Assistantships available for students in the Ph.D. program. Each research assistantship is normally associated with a faculty member within the department who has recently received a grant or have research projects to be assigned to the student. Research Assistantships are awarded on a competitive basis and are selected in consultation with the faculty members who will be working with the research assistant. Research assistants are eligible to receive a summer assistantship that carries a stipend and additional four credit hours of tuition waiver. Research assistants holding a summer assistantship normally continue to assist a faculty member with their research project.
Graduate Fellowships

The department has a number of Doctoral Fellowships and Master’s Fellowships available for students in the Ph.D. program and master’s program, respectively. Fellowships are awarded on a competitive basis. This award provides a stipend and tuition waiver of 24 credit hours per year. Fellowships do not have any teaching-related duties or duties assisting a faculty member with research during the academic year. However, a non-first year graduate student who receives the fellowship is required to give a graduate student seminar during the year of the fellowship.

Fellowship students are eligible to receive summer support. Fellowship students holding a summer assistantship normally provide tutoring for students in lower-level mathematics courses or assist a faculty member with a research project or with grading.

Policy on Selection and Reappointment of Doctoral Fellowships

- Doctoral Fellowships are awarded on a competitive basis to students who will be enrolled full-time in the Ph.D. program in mathematics. These fellowships are awarded to students who have completed a master’s degree in mathematics or who have strong mathematical preparation in their undergraduate degree.
- During each of the two semesters of the award, recipients of Doctoral Fellowship must register for and complete at least nine graduate semester hours in the courses approved by the Mathematics Department, and must maintain a GPA of 3.0 or higher.
- Doctoral Fellowships are awarded for one year. A student may receive a Doctoral Fellowship for no more than two years while at CMU.

Policy on Reappointment of Graduate Assistantship (TA or RA)

Graduate Assistantships are awarded for one academic year. Reappointment is not guaranteed. The reappointment decisions of graduate teaching assistants are made by the Graduate Committee based on the Criteria for Evaluation of Graduate Students (see below.)

Assistantships awarded to students in a master’s degree program are renewable for one additional year. Graduate Assistants enrolled in a master’s degree program requesting assistantships beyond two years must compete with new applicants for such awards.

A doctoral student who is supported with assistantship and/or fellowship by the mathematics department is eligible for such support for a maximum of seven (7) years. If students were admitted and supported in our master’s program, the years they were supported as a master’s student counts in their seven (7) years of funding.

Criteria for Evaluation of Graduate Students

Graduate students will be evaluated periodically in order to track performance. Students will be evaluated both in their progress towards their degree and in their teaching performance (if they are Graduate Teaching Assistants). The criteria for the evaluation of a graduate student are the following:

Teaching Performance of Graduate Teaching Assistants

1. Preparation for and delivery of instruction:
   - Is the GA well prepared for his/her class?
   - Does the GA prepare and take all needed materials to the class?
1. Does the GA use the class time effectively?
   - Does the GA deliver mathematics instruction soundly and logically?
   - Does the GA attempt to help connect mathematical ideas in his/her lessons?
   - Does the GA assess students’ progress using various methods, such as homework, quizzes and tests, in a timely manner?
   - Does the GA grade and return graded material promptly?

2. Communication with students:
   - Does the GA speak clearly and write legibly?
   - Does the GA take questions from students and answer them clearly and completely?
   - Does the GA provide students with information about syllabi, exams, tutoring hours, and department and university policies?
   - Does the GA give adequate office hours? Does the GA hold those office hours?

3. Other teaching related duties:
   - Does the GA have a clearly stated grading policy in her/his syllabus?
   - Does the GA keep accurate record of students’ grades?
   - Does the GA attend all required course meetings?
   - Has the GA completed RCR training?

Progress in the Degree Program

4. Completion of RCR training:
   - The Graduate Committee, in determining the completion of these requirements, will use the record on file regarding the training.

5. Progress in coursework:
   - To determine the progress in coursework,
     - Master’s students must complete the Advising Worksheet on the https://mth-grad.cst.cmich.edu site with a two-year plan of study in consultation with their academic advisor during the FIRST SEMESTER of enrollment, and update the grades at the end of each semester to keep the academic performance data current on the Advising Worksheet. The Graduate Committee will examine the grades earned in the courses (on the plan of study) and the student’s GPA.
     - Ph.D. students must complete the Advising Worksheet on the https://mth-grad.cst.cmich.edu site in consultation with their advisor during the FIRST SEMESTER of enrollment, and update the grades at the end of each semester to keep the academic performance data current on the Advising Worksheet. The students must meet with the academic advisor at the beginning of the fall semester to update the Advising Worksheet with an updated two-year plan. The Graduate Committee will examine the grades earned in the courses (on the plan of study) and the student’s GPA.

6. Progress in Ph.D. Dissertation/Master’s Plan A or Plan B:
   - Supervisors of Plan A, Plan B, or Ph.D. dissertation will be consulted by the Graduate Committee to determine student’s progress.

7. Completion of Ph.D. qualifying examinations:
   - The Graduate Committee, in determining the completion of this requirement, will use the letters on file regarding qualifying examination results.

8. Completion of Ph.D. teaching internship:

16
- The Graduate Committee, in determining the completion of this requirement, will use internship portfolios and comments from course supervisors.

9. Completion of Ph.D. Prospectus:
- The Graduate Committee, in determining the completion of this requirement, will use the Prospectus submission form approved by the Office of Research & Graduate Studies.
Additional Funding Opportunities from the College or University

(A) The Department of Mathematics and the College of Science and Technology have funds available for graduate student professional growth activities (for example, travel funds to present research results at a conference.) The application for this program can be found at: https://team.cmich.edu/sites/cst/_layouts/15/WopiFrame.aspx?sourcedoc=/sites/cst/CST%20Student%20Organizations%20Forms/student_presentation_grant_application%202014-15.pdf&action=default

(B) The Office of Research & Graduate Studies has a number of programs that provide support for graduate students. Students may apply for these grants I fall or spring semesters. These programs include:

- Graduate Student Publication & Presentation Grant.
- Graduate Student Research Grant.
- Financial Assistance Options for International Graduate Students.

Further information and application forms for these programs may be found at: https://www.cmich.edu/office_provost/ORSP/StudentResources/Pages/default.aspx

(C) The Dean’s Research Assistantship for one term support either in summer or fall semester. The general purpose is to provide extra time for Ph.D. students who are at the stage of working on their dissertation work toward their degree. Students who are eligible for this opportunity must have passed all required qualifying exams. Priority will be given to students in their last year of completing their degree. If a student has received this award, s/he will be receive a low priority if s/he reapplicant for this award again.

The process of application starts with the announcement of requesting students to submit their proposals to the Graduate Committee during the late of January or early February for Ph.D. students to apply. The proposal is limited to two pages and must include the following information:

- Title of the proposal:
- Advisor’s name:
- The term for the award (summer, fall or spring):
- Date of submission:
- Description of the Project:

If a proposal does not follow the above guideline, it is excluded from consideration. The Graduate Committee reviews and ranks the proposals, selects up to five proposals and consults with the Department Chair to finalize the proposals for submission to the Dean’s Office.

Note 1: If you apply for the summer term, you must be available for the entire summer.
Note 2: If you apply for the fall or spring semester, it does not affect your application for funding renewal for the academic year.
Part II: Timeline of Important Activities and Tasks

As a current graduate student, maintaining strong academic work is your primary responsibility. Beginning in the first year of your graduate program, there is a list of activities and tasks you need to complete on an annual basis. These activities and tasks are described in the Graduate Student Handbook. It is essential that you carefully read through the Graduate Student Handbook to learn about various activities and tasks along with departmental policies that are related to your responsibilities or your rights as a current graduate student in the Department of Mathematics.

The Timeline of important activities and tasks:

Note: P: Ph.D. student, M: Master’s students (including Graduate Certificate, M.A. and M.S. programs). If no ‘P’ or ‘M’ is marked, it means the task is for all graduate students.

<table>
<thead>
<tr>
<th>Timeline (approximately)</th>
<th>Activities (P: Ph.D. student only)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>August</td>
<td>New TA Teaching Workshop</td>
<td>This is required for all first time TA</td>
</tr>
<tr>
<td></td>
<td>New Student Orientation Day</td>
<td>This is required for all new graduate students, but optional for current students.</td>
</tr>
<tr>
<td></td>
<td>Plan/update course work with Academic Advisor.</td>
<td>This should be done on the orientation day for new students, and should be done during/prior to the early fall semester for current students.</td>
</tr>
<tr>
<td></td>
<td>Qualifying Exam (P)</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>Announce Qualifying Exam results (P)</td>
<td>The results will be announced about 2-3 weeks after the August exams.</td>
</tr>
<tr>
<td></td>
<td>Teaching Internship Application for Spring semester (P)</td>
<td>The form is on mth-grad site. Students will receive the form from department.</td>
</tr>
<tr>
<td></td>
<td>Independent study application – course to substitute for regular course (Require the approval of course instructor, advisor and graduate committee)</td>
<td>The form is on mth-grad site. Students must go to the site to submit the request.</td>
</tr>
<tr>
<td></td>
<td>Graduation application for December graduation</td>
<td>See exact date on College of Graduate Studies site</td>
</tr>
<tr>
<td>October</td>
<td>Sign-up January Qualifying Exams (P)</td>
<td>The sign-up sheet is on mth-grad site. Students will receive the sign-up sheet from department.</td>
</tr>
<tr>
<td></td>
<td>Thesis/Dissertation submission for December graduation</td>
<td>See exact date on Office of Research &amp; Graduate Studies site</td>
</tr>
<tr>
<td>November</td>
<td>In-class visit TA evaluation: The MTH105/055 Course Director will visit every TA randomly each semester.</td>
<td>Typical time is in October or November for fall.</td>
</tr>
<tr>
<td>December</td>
<td>Qualifying Exam (P).</td>
<td>The form is on Grad site. Students will receive the form from department.</td>
</tr>
<tr>
<td></td>
<td>Application for Ph.D. admission &amp; support.</td>
<td>Admission submission is on the Graduate College website. Financial support application is through Math Department web site.</td>
</tr>
<tr>
<td>Month</td>
<td>Event</td>
<td>Details</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>February</td>
<td>Summer funding requests. Next academic year funding requests.</td>
<td>Proposal is required. Application form is on mth-grad site. Students will receive the form from department.</td>
</tr>
<tr>
<td></td>
<td>Application of the College of Science Technology (CST) Research Assistant for one term of the coming summer, fall or spring term.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Independent study – course to substitute for regular course.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graduation application for May graduation</td>
<td>See exact date on Office of Research &amp; Graduate Studies site</td>
</tr>
<tr>
<td></td>
<td>Thesis/Dissertation submission for May graduation</td>
<td>See exact date on Office of Research &amp; Graduate Studies site</td>
</tr>
<tr>
<td></td>
<td>Application for Ph.D. admission &amp; support. Admission consideration is evaluated once the admission materials are complete. Deadline for full consideration of financial support is February 15.</td>
<td>See Prospective Information for Graduate Students’ site on the Math Department site for details.</td>
</tr>
<tr>
<td>March</td>
<td>Teaching Internship Application for Fall semester (P)</td>
<td>The form is on mth-grad site. Students will receive the form from department.</td>
</tr>
<tr>
<td></td>
<td>Sign-up August Qualifying Exam (P)</td>
<td>The sign-up sheet is on mth-grad site. Students will receive the sign-up sheet from department.</td>
</tr>
<tr>
<td></td>
<td>In-class visit TA evaluation: The MTH105/055 Course Director will visit every TA randomly each semester.</td>
<td>Typical time is in March or April for spring.</td>
</tr>
<tr>
<td>April</td>
<td>Announce summer support and work duty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Announce support renewal for fall of next academic year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct a survey of TA’s course schedule in the next fall semester.</td>
<td>In order to properly assign TA’s teaching schedule in the next academic year, a survey to collect TA’s course schedule is conducted.</td>
</tr>
<tr>
<td>June</td>
<td>Graduation application for August graduation</td>
<td>See exact date on Office of Research &amp; Graduate Studies site</td>
</tr>
<tr>
<td></td>
<td>Thesis/Dissertation submission for May graduation</td>
<td>See exact date on Office of Research &amp; Graduate Studies site</td>
</tr>
<tr>
<td>July</td>
<td></td>
<td></td>
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</tbody>
</table>

**NOTE 1:** In order to apply for graduation, a student must submit the form of ‘Authorization of Degree Program’ for course work audit.

**NOTE 2:** The department has weekly colloquium from 4:00 – 5:00 pm every Thursday and weekly Graduate Student seminar from 4:00 pm – 5:00 pm. Students are required to attend the weekly Graduate Student Seminar. See the Handbook for the attendance policy.
Part III: Important Information from the Department Office for Graduate Assistants

Office Hours, Local Home Address, Phone, and Emergency Contact
At the beginning of each semester you will receive an email from the department office requesting your office hours, current local address, local phone and/or cell phone number. It is imperative that you respond to this email on a timely basis. Your office hours will be posted in a variety of places including the Mathematics Department webpage. If your personal information or office hours change during the semester, please email the updated information to math@cmich.edu immediately.

You will need to notify the University of any address or phone number changes. Log onto the Central link website (https://centrallink.cmich.edu/), click on “My Account”, then scroll down to “My Profile” and then click on ”Address Change” and make the necessary changes. At this site, there is an option to check the box marked “Confidentiality” if you do not want your home address or home phone number listed in the CMU Phone Directory.

“My Profile” also contains your “Emergency Contact Information.” Please make sure your information is correct.

Keys
During orientation week GAs will receive the following keys:
- a key to your office (this key will also open an outside door to Pearce Hall); and
- a C-118 key which opens PE 215 (the workroom), PE 216 (the conference room), PE 201 (main hallway door to PE 201F), PE 201F (printer and photocopier location), PE 206 hallway (printer location), and PE 134 (printer location).

You will be asked to sign a statement acknowledging which keys you have received and verifying that you have read the department key policy. Please read this form carefully and feel free to ask questions. There is a penalty for losing keys.

Mailboxes
Every GA will have a mailbox in the workroom (PE 215). Mailboxes should be checked daily for notes about teaching your classes and your mailbox should be emptied on a regular basis.

E-mail/Computer Assistance
All GAs should be using their CMU email account and checking it daily for departmental emails. If you need computer assistance, you can either contact the CMU Help Desk at 774-3662 or log on at https://helpdesk.oit.cmich.edu/portal/login.asp to submit a work order.

Photocopying
- All GAs will receive a copy code (the last 4 digits of your CMU id). This code will work on either photocopier in the department.
- Do NOT give your copy code to others. Unauthorized copies or sharing of your copy code may result in charges to the GA. Too many unauthorized copies could result in termination of copying privileges.
- Prior to using either photocopier, please ask the department staff for a brief explanation of how to operate the machine properly.
- Please do not run blank sheets of paper through the copier! The department is charged for all sheets run, blank or not. Use of colored paper is acceptable.
GTAs are expected to make photocopies for teaching purposes only. (A GTA teaching a 3 credit hour class would normally not be making more than 500 copies per class per month and for a 4 credit hour class would normally not be making more than 750 copies per class per month). The number of photocopies made are monitored on a monthly basis by the department chair.

- Fellowship and Department-supported Research GAs are allowed to make copies for research purposes only. The number of copies should be minimal (less than 100 per month).
- It is important that you observe U.S. copyright laws. Do not put yourself or the Mathematics Department in legal jeopardy by making unauthorized copies of copyrighted material.

If you have questions regarding the foregoing, please contact the department chair.

**Supplies**
You will be issued supplies at the beginning of each semester. Please return any unused supplies to the department office no later than the end of each semester. These supplies and those in the workroom are for teaching purposes only.

**Payroll**
GTAs are paid bi-weekly, for a calendar of pay dates please visit: https://www.cmich.edu/office_provost/academic_administration/FPS/resourcecenter/Documents/15-16%20GA%20Pay%20Schedule.pdf. Your first pay will be September 10, 2015 and your last pay will be May 5, 2016.

At Central Michigan University, we strive to be environmentally friendly. As part of this effort we pay all of our employees electronically. Please sign into CentralLink as soon as possible to select from one of the following pay options.

- Direct Deposit – Your pay deposited into a checking or savings account anywhere in the United States
- CMU Money Card – MasterCard debit card that can be used anywhere MasterCard is accepted.

Follow the following link https://www.cmich.edu/fas/fsr/OAC/Payroll/Pages/Forms-Payroll.aspx which will take you to the registration site on CentralLink. **Failure to select from one of the two options will result in being defaulted to the CMU Money Card.**

You can retrieve your pay statements (pay stubs) electronically on your CentralLink by clicking on “My Account” located in the upper right hand corner than scrolling down to the link “View My Pay Statement.” If you have further questions, please call CMU Payroll and Travel Services at (989) 774-3481.

**Custodian Issues**
If there is any type of spill or accident that needs to be cleaned up in Pearce Hall Monday thru Friday between the hours of 7:30 a.m. and 5:00 p.m., contact the Math Department office at 774-3596; after 5:00 p.m. or on the weekends, call Action (the answering service for FM) at 989-772-8225. Please know the location and type of cleanup needed before you call. **DO NOT** try to clean up any type of body fluid (blood, vomit, etc.) on your own.

**Office Etiquette and Professionalism**
Most GAs will have a desk and two drawers of a filing cabinet. The desks and cabinets will be labeled with your name. Please do not remove the labels.
All offices should be kept clean and organized; DO NOT leave food or trash anywhere in the room. Custodians are not able to clean your offices effectively if there is litter on the floor. It is your responsibility to clean/dust your desk/tabletop.

PLEASE DO NOT store items on the tops of file cabinets or in the common areas. DO NOT write on furniture or post any items on furniture that is not easily removed or that will leave marks. DO NOT post anything on the walls.

Remember, the impression students and other visitors get from your office/desk area reflects upon the department as a whole. Please do your best to make it a positive impression.

Questions

Contact Donna Ahlers (ahler1dj@cmich.edu; 774-3597; PE 213) if you have questions regarding:
- Paychecks & Tuition
- Reimbursements
- Keys/Rooms
- Photocopy Codes
- Mailboxes

Contact Tracee Wilson (wilso3t@cmich.edu; 774-3596; PE 214) if you have questions regarding:
- Student Opinion Surveys
- Books for classes you are teaching
- Supplies
- Registering for Independent Study classes

Please feel free to contact either Donna or Tracee about any other questions.
Part IV: Graduate Teaching Assistant Information

If you have any questions or need further information contact the Supervisor of Graduate Teaching Assistants:
Julia Burch
Office Location: Pearce 201B
Office phone: 774-1390
Cell phone: 989-854-1347
Email: burch1j@cmich.edu
Fax: 774-2414
Introduction

The information in this section is designed to answer common questions you may encounter as a Teaching Assistant in the Mathematics Department at Central Michigan University. It should be used together with the textbook publisher’s material to make your job of teaching your courses as easy as possible. Be sure to read through all material in this part of this handbook before teaching your first class.

Most TAs will be teaching MTH 105 (Intermediate Algebra) the first semester. This three-hour course meets either two or three times a week for the entire semester. MTH 105 is a tightly coordinated course; the coordinator establishes the curriculum and calendar, and creates the exams and keys. You will administer, proctor, and grade exams, and create weekly quizzes, and you will assign final grades for your students.

Your MTH 105 students should be familiar with basic arithmetic (fractions, decimals, percent, ratios) and Beginning Algebra concepts including linear equations, graphing, exponent rules, factoring, and applications using these concepts. In MTH 105 we stress applications (mixture, distance/rate/time, inequalities, etc.) that use algebraic methods (factoring, use of systems of equations, etc.) as well as teach functions, graphs, rational expressions, rational exponents, and other algebra topics.

Some of your MTH 105 students dislike and/or fear mathematics and have never been very good at it. As a teacher you will need to be non-threatening and supportive toward them. Go as slow as the syllabus in the student course pack allows (this will still be too fast for some). Give your students opportunities to ask questions, and never belittle or embarrass them, even if you think a question is trivial.

After your first semester of teaching you may be asked to teach other courses beyond MTH 105, in which case you will be responsible for preparing all exams and materials for the class. You will be supervised in teaching these classes.

Your Responsibilities

Classroom Instruction

Most of you will be teaching sections of around 35-40 students. Do prepare, even if this material is pretty easy for you. Have a written set of lecture notes, and have examples and problems, especially story problems, worked out completely. Try to find more than one approach to get to the solution of a problem so that you can explain problems effectively. You should be prepared to set up and work every problem in the assignment. If you do run into trouble in explaining a problem during class, politely ask if you could have some more time to think about the problem and that you will finish the problem next time. Then do it! There is nothing students hate worse than a teacher who promises to show them something next time and then forgets to do it (or still cannot do it the next day!) We will address teaching issues/techniques in our course meetings.

If You Can’t Make Your Class

During the semester, you may end up getting sick, having to go to a funeral, or having some other situation happen where you will need to miss class. You are responsible to find your own substitute teacher (preferably an instructor teaching another section of the same class.) If you cannot find a substitute, let your supervisor know at once (call him/her at home or at work.) Classes will not be canceled unless there is a University cancellation. Never cancel class for a personal reason! Information about weather-related University cancellations can be obtained by calling 774-7500.
Class Times
It is important to be on time for all scheduled classes. Also, you should NOT dismiss your scheduled classes before the end of the time period. Have plenty of problems available for student practice in case you finish early.

Office Hours
You are required to hold a minimum of three office hours per week. You will be asked to hold one of the three office hours per week tutoring at the Mathematics Assistant Center. Please try to schedule these times at regular intervals that will be conducive to students being able to find you and to make use of your time. Whatever time you schedule and announce to your students should be rigorously observed. If you need to cancel an office hour for some reason, let your students know ahead of time, and schedule another make-up hour sometime in the near future. Submit your office hours to the Department office for posting on the Mathematics Department web page and on the office bulletin board outside PE 214.

Testing and Grading
If you are teaching MTH 101 or MTH 105, all instructors give the same exams and use the same grading scale. Information about grading and testing will be presented at instructor meetings for these courses. If you are teaching courses beyond MTH 105, you will construct your own exams and grading scales. Whatever course you teach, it is important to be consistent and fair in assigning grades.

All Math 101 and Math 105 students will be using an on-line homework system called MyMathLabPlus. Student’s homework will be graded automatically and students will receive instant feedback. In addition to homework, students should be evaluated in some way (quiz, written work, or exam) at least once a week. They need frequent feedback on how they are doing. Frequent evaluation encourages attendance and motivates the students to do the work. The daily grade should accurately reflect what the student knows and what effort he/she is putting forth. Use a combination of in-class quizzes, take-home quizzes (no more than one) or group work. DO NOT rely solely on take-home quizzes or group work, on exams a student is expected to recall information without notes, textbook, or friends to help.

For MTH 105 and MTH 101 classes, no extra credit is allowed during the semester, except for that which is on the exams. Occasionally we will agree to offer a bit of extra credit, but that will be a decision from an instructor meeting that we all will follow. It is not fair to some classes if another instructor is handing out extra credit opportunities. If you wish to drop some quiz scores, give a makeup quiz if the class did not do well on a particular quiz, or give an open book or group quiz, that is fine.

Attendance
Take attendance each day in some way. During the semester you may be contacted by the athletic department checking on how many times a student-athlete has missed class, what assignments are missing, etc. If a student has financial aid and fails the course, at the end of the semester you are required to provide the student’s last day of attendance. If you are giving a quiz or exam this can act as an attendance check; otherwise you can just pass a sheet of paper around and have everyone sign in. This takes no additional class time. If a student has poor attendance, his/her daily grade is normally affected by lowered quiz or homework scores, etc. You can also use attendance as a decision-making factor in assigning grades at the end of the semester for students with borderline grades. If you assign an E grade, then you need to report attendance.

Instructor Meetings
Instructor meetings, prep-week and mid-semester meetings, are REQUIRED for MTH 055 and MTH 105 instructors. Time of the MTH 105 instructor meetings will be determined during the prep week meeting. A time will be determined for MTH 055 meetings as needed. Do not schedule office hours or other activities during this hour. If a meeting is not necessary in a particular week, you will be notified.
The intent of our weekly meeting is to share problems and concerns, to plan teaching strategies, and disseminate exam material.

Other Responsibilities
You may be asked to help construct, proofread, or critique exams, and to conduct review sessions before exams. The supervisor will try to distribute these tasks equally among the instructors.

Syllabus
Create a syllabus with pertinent information for your class. Post a pdf syllabus in your Blackboard course – you do not need to provide paper copies. Required information on the syllabus: Office hours, contact information (office number and phone, email), required materials, course objectives and outline, grading scale and policies (including if you allow for making up missed work), and the accommodation statement – which must be copied and pasted exactly as written in the sample syllabus on the next page. If you are teaching MTH 101 or 105 you may reference the Course Pack for objectives, outline, grading scale, and general course policies. On the next page is a sample of Julia Burch’s syllabus, which you may adapt to fit your needs. Again… the University statement on students with disabilities (see last paragraph of the sample syllabus) must be copied verbatim. All GTAs are required to submit a copy of their syllabus to their supervisor for each class, each semester.

End of Semester
At the end of each semester, for each class that you teach, you need to turn in a copy of your final grades, a copy of your grade records (grade book or spreadsheet,) and graded final exams to the graduate assistant supervisor. Make sure to keep all grade records accessible in order to answer a student’s questions about the final grade.

At the end of your contract you need to return all keys, textbooks, etc. as required by the department. Also leave your forwarding address and other contact information (telephone number, e-mail address, etc.) with the department secretary.
INSTRUCTOR: Mrs. Julia Burch  
E-mail: burch1j@cmich.edu  
OFFICE: Pearce 201B  
OFFICE PHONE: (989) 774-1390  
MATH DEPT. PHONE: (989) 774-3596  

OFFICE HOURS: Monday 10:00 a.m. – 12:00 p.m., Tuesday 9:00 – 10:30 a.m. and 12:30 – 2:00 p.m.  
Other times available by appointment via e-mail, or use walk-in tutoring.  

CLASS TIME/ROOM Section # 22172792 TR 11:00 a.m. – 12:15 p.m. Pearce 136  

MATERIALS  
- Required: Course Pack for MTH 105 (available at both bookstores)  
- Required: MyMathLabPlus Online access (e-book included)  

CALCULATOR: See Course Pack for details.  

COURSE OUTLINE: See Course Pack for assignments and test schedule.  

COURSE OBJECTIVES:  
The study of algebraic rational expressions and equations, functions, linear and quadratic equations, linear inequalities, systems of linear equations, radicals, negative and rational exponents.  

METHODOLOGY: Lecture, discussion, and teacher directed activities.  

ATTENDANCE:  
Regular attendance is essential for success in this class. If for some reason you are unable to attend class, it is your responsibility to read through the material presented during your absence and to do the homework assigned. Ten points of the daily work grade are assigned for attendance. Two points are deducted for every unexcused absence. An absence is considered excused for participation in university related activities with advance notice, and documented health issues. Make-up exams are given the Friday of exam week for those with excused absences only.  

Be courteous to others.  
- Arrive on time.  
- Once in class, plan on staying the entire class period.  
- Come to class prepared to work for the full 1¼ hours: bring tissues and bottled water, and visit facilities before class, as needed.  
- Coming in late, frequent trips to the hall/facilities/drinking fountain, and/or capriciously leaving class early is disruptive to everyone and will be considered an unexcused absence regardless of the amount of time late, missed, or remaining.  
- While in class, you are expected to be focused on the topic at hand.  
- Texting, surfing the Internet, etc., is considered disruptive behavior, and may result in disciplinary action. (See sections 3.2.3 and 3.2.4 of Code of Students Rights, Responsibilities, and Disciplinary Procedures in your Undergraduate Bulletin.)  

HOMEWORK:  
Homework is worth a total of 100 points. All homework will be done online. Be aware of the due dates online. Homework deadlines will not be extended.  

DAILY WORK GRADE:
The daily work grade is worth a total of 100 points. Ten of these points are for attendance. Two points will be deducted for every unexcused absence. The other 90 points will be from quizzes. There will be 8 quizzes worth 15 points each; the lowest 2 quiz scores will be dropped. There will be no make-up quizzes. If you will miss a quiz due to participating in a university-sponsored event, see Mrs. Burch to arrange to take the quiz before you go.

GRADES:
There are a total of 650 points for the class. Homework is worth 100 points and the daily work grade is worth 100 points. There are three exams worth 100 points each, and a final exam worth 150 points. Grades will be assigned as described in Course Pack. Final letter grades with +/- will be determined at the end of the semester.

FINAL EXAM:
The final exam is comprehensive. See bulletin or CMU portal for schedule.

WEATHER ISSUES:
University cancellations due to weather can be obtained by calling 7500.

ACCOMODATIONS:
CMU provides students with disabilities reasonable accommodation to participate in educational programs, activities or services. Students with disabilities requiring accommodation to participate in class activities or meet course requirements should first register with the Office of Student Disability Services (120 Park Library, telephone# (989) 774-3018, TDD #2568), and then contact instructors as soon as possible.

Additional Remarks and Helpful Suggestions
The supervisor of the Graduate Teaching Assistants will observe each of you at least once during the semester. You will be given written comments for your use, with suggestions on teaching style, hints, preparation, and general improvement. These visits will not start until the third week or so of the semester, and it will not necessarily be before the first test, so if you have questions sooner, do not hesitate to contact the supervisor. Newer instructors will be observed first. You will not be given advance notice unless you notify the supervisor that you prefer knowing when he/she is planning to visit your classroom. If the supervisor’s schedule makes it impossible for him/her to see you teach, then another professor may observe your teaching.

Dress appropriately on the days that you teach a class. You should be dressed at a level higher than the typical student. Your common sense should dictate your attire.

Make an effort to learn your students’ names as soon as possible. This is useful in so many ways, and the students notice and appreciate a teacher who knows them by name. It will help in maintaining good attendance and class order because they will realize you notice when they are absent (or inattentive.) Make a seating chart or pass an attendance sheet around each day, then glance at it while you are lecturing and use the students’ names as you teach. Hand back quizzes and tests individually to each student if you have time, and look at their faces when you do this. It will help you connect names with faces. You should recognize each of your students’ names by the end of the second or third week of class, even if you cannot connect the name and the face yet. You should know, for example, when you are grading a test that a particular student is not yours, and you have an exam that belongs to another instructor by mistake. Learning students’ names will pay big dividends!
Discipline Problems—Student Code of Conduct
The University Bulletin Appendix 1, article 3.2.3 and 3.2.4, gives support for an instructor to remove a disruptive student from class. You should be aware that these statements exist and that you have the right to use them if necessary. Hopefully, this will not be an issue.

Grade books: If you use a hand-written grade book, you may not want to write students’ names in it until after the drop-back period has ended (about the second week of classes.) Keep their daily work grades written on your class list until then. Using a spreadsheet for grades lends efficiency to your record keeping, as you can put in late additions or changes at any time. You must keep a hard copy backup of your spreadsheet grades! Write the grades in pencil or pen and then transfer them to the spreadsheet. If you simply enter grades from the student’s paper to the computer, there will be no way to check if you entered a grade incorrectly. Use a separate cell for each quiz or homework score, labeled Quiz #1, Quiz #2, etc. In other words, we need scores itemized individually, not just a running total of quiz or homework points. You must be able to document any and every grade that you give. If you are teaching MTH 101 or MTH 105 you are REQUIRED to use the grade book in MyMathLabPlus. It is easy to use, allows students to see their grades for online and offline assignments, and is used to calculate final grades.

Lesson Plans
In planning your presentation of the material for MTH 101 or MTH 105, look at the Course Packet and text assignments first to see exactly what is to be covered. Course Objective sheets will be provided to help you with content for lesson plans. Sometimes not everything in a section is covered and you do not want to use valuable class time discussing something the students are not going to be responsible for. Do the homework problems (or at least the harder ones) to see how involved your lecture will have to be to cover everything adequately.

Classrooms
You will be teaching in either Moore Hall or Pearce Hall. Classrooms that we use in Pearce Hall and Moore Hall are equipped with visualizers. If you are not familiar with this equipment, we will arrange for someone to demonstrate what is possible and how to use the equipment. You will need a code to operate these machines. Visualizer codes are different in every building and change each semester. You will be given the code(s) for the building(s) you teach in.

What to Do if You Finish Your Lecture Early
The usual situation is that we never seem to have enough time to get through all the material in MTH 101/105. No matter which course you teach, if you are consistently getting done with your classes more than five minutes early, you are going too fast. Most of your students are lost, even though they may not tell you. They may not even realize that they are lost until the exam, when it is too late. Be sure to allow time for students to ask questions about homework or quiz problems, or about material you are presenting in a lecture.

Ask your students questions! Questions do not have to be fancy! Some sample questions you could ask your students might include:

- Who did this problem a different way? What was your way?
- Which solution to this problem is easier to understand, mine or Student X’s? Why?
- What homework problems did you have trouble with? (You may not have time to go through many of them in class, but at least you will know what problems you are going to be seeing in office hours!)
- Is there some rule or formula that we need for this problem? Tell me the name, if you cannot remember exactly what it says.
- We just subtracted five from both sides of this equation. Can somebody please tell me what we should do next? Can someone explain why we did that?
If you are allowing plenty of time for questions and you still have time left over, try these suggestions:

- Give students some review problems over a topic covered earlier in the week. Let them work in groups while you walk around and answer questions.
- Give a quiz (real or practice—have it made up in advance, or pull problems out of the book.)
- Do some review word problems—these are always confusing for these students.
- As a last resort, start some new material, particularly if the topic you are covering seems easy for your students and you know something hard is coming up. (Note: word problems and graphing are always hard for 055/105 students.)

**Grading Hints**

Keep your quizzes short. Use two or three problems. If you do not like making up quiz problems, use homework problems—it encourages students to do homework. Short, frequent quizzes are more helpful for feedback than long, infrequent ones. They are easier to make and to grade and they do not take as much class time.

**Promptness in Grading**

It is a courtesy to your students to get their quizzes, and exams graded as soon as possible, ideally by the next time that section meets. This is particularly important on the first test, when students with scores below 70% will be thinking seriously about dropping the class and may wish to come in for advice on what to do.

**Tutoring Opportunities (Student Support Services)**

The Mathematics Assistance Center has two location: Park Library (room 428) and 002 Troutman Hall (Towers Basement). Free walk-in tutoring is available. The Mathematics Assistance Center - Park Library is open Monday – Thursday from 9:00 a.m. to 9:00 p.m., and Troutman Hall is available Sunday from 5:00 p.m. to 9:00 p.m. and Monday – Thursday from 2:00 pm to 9:00 p.m. Tutoring will begin on the first day of the second week of classes and will run through the last week of classes. The Center is not open during finals week. The goal of the Math Center is to give students additional help and explanations for math concepts being taught in their courses. Tutors **should not** do homework assignment for students; they **should not** substitute as a student’s instructor when the student has missed class and they **should not** do problems on take home quizzes.

**Supplementary Instruction Sessions** for many university courses are set up by Academic Advising and Assistance. You will be notified of times and locations, and are expected to pass on the information to your students.

**Review Sessions** will be held before each MTH 105 exam. These are in addition to any review you may have time for in class. They will generally be held in the evening a day or two before the test. Some of you will be asked to run a review session. Encourage your students to attend these sessions. We try to accommodate the wishes of the students as far as days/times. Be sure to hand out the exam information sheets, which you will be given before each test. MTH 055 instructors will review in class and may schedule out-of-class reviews at their discretion.

**Paid Individual Tutors** are available; a list of names is kept in PE 214. Students arrange this on their own. If you are interested in putting your name on a list to be a paid tutor, please see the secretary in PE 214 as soon as possible. GTAs may not tutor a course that they are presently teaching.
Other Guidelines

University Mathematics Competency
The University has a competency requirement for Mathematics. The competency requirement is the minimum mathematics required for a student to graduate with a bachelor’s degree from Central Michigan University. More information is outlined in the MTH 055 and 105 Course Packs and is available in the Undergraduate Bulletin.

Adding (Bumping), Withdrawing, and Dropping a Class
Students may drop and add classes online through mid-night of the first Friday of the semester via Central Link’s course registration site. In general, if a student desires to "bump" into a closed section, they must seek the instructor's approval. Check with your course coordinator for confirmation of the course's "bump" policy.

The last day for students to drop back to a lower level class or move to a higher level class is the first Friday of the semester. These students will be taking the first exam at the regularly scheduled time—they are NOT eligible for a make-up on Exam #1 unless they have some other problem, like illness. You will need to come up with your own policy for how you will handle make-up work (quizzes, etc) for these students on their daily work grade.

The last day to withdraw from a course occurs at the tenth week of the semester. Students will be doing this online via Central Link. Note: The terms “withdrawing” and “dropping” are used loosely by many people, but “dropping” a class implies that the student will get a refund of money; “withdrawing” does not. Dropping a class only occurs during the first week’s “Drop and Add” period.

Class Lists
You will access your class lists by using Central Link. You will probably have 35-40 students in each of your classes. You should compare your attendance sheets to your class lists to determine any inconsistencies. Check the online class list frequently during the first few weeks, because it will be updated regularly by the Registrar. Once you have the official class list, compare it with your sign-in attendance sheets and make note of any student who is on your list but who has never attended.

Report of Non-Attendance
As previously mentioned, you must take attendance each day. At the end of the third week of class, you should submit a Report of Non-Attendance for students who have never attended your class. The form can be completed on-line at the registrar's website, which may be accessed via Central Link. There is also a place on the Non-Attendance Report form where you can report that a student has quit coming to class. You can submit this report to the Registrar at any time during the semester before the final date to withdraw from a class (tenth week.) Also check to see if you have students attending your class who are not on your lists. They might be attending the wrong section and we need to get them into the correct section.

Student Opinion Surveys
At the end of each semester you are required to administer course evaluations. These student evaluations are on record in the department office and also on-line. Part of the student evaluation includes written comments that are often helpful in improving your teaching.

Grade Reports
Final semester grades are submitted on-line to the Registrar’s Office. You will receive instructions from the Registrar as to how to complete the necessary forms. For those teaching MTH 101 or MTH 105, you will be given explicit instructions for computing your final grades. You must follow the department and course guidelines for assigning grades. It is patently unfair and unprofessional to give a student a grade that is higher or lower than he/she earned, whether this was done intentionally or unintentionally.

**Giving an Incomplete (I) Grade**
The CMU policy on giving a student an “I” grade is outlined under Academic Information in the Bulletin. An “I” should be given only when a student has completed with satisfactory grades (usually interpreted as C–, but some will give it to anyone who is passing) the major portion of the course requirements (usually 70% of the work), and has convinced the instructor of his/her ability to complete the remaining work without re-registering for the course. It is not to be given to a student doing failing work. It is used when a student, because of illness or other justifiable circumstances, cannot complete the work within the framework of the semester schedule. The instructor must give the department a formal statement of the requirements left to complete the course and how this is to be done; you must also give the deadline (date) by which the student must complete the work. Both the instructor and the chairperson must sign the form and a copy must be given to the student. (If this is for a MTH 101 or 105 classes, a copy is also given to the GTA teaching supervisor.) This is not an easy grade to give, and although students will pressure you for an “I” rather than an “E” or a “W”, you must hold firm to the University and Department guidelines. The department has a special Report of Incomplete form which is available in the department office. Do not use the form available through the Registrar’s office.
Part V: APPENDIX

Appendix A: Instructions for accessing https://mth-grad.cst.cmich.edu site

Your ID is your CMU Global ID. You can reset your PW when you are on the site to login. Also, if you forget the PW, you can make a request of a new PW and change it to the one you prefer.

When I enter the site, this is my main page. Your main page only consists of items you are eligible to access.

---

**CMU Department of Mathematics Graduate Program**

**Home**

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**Site administration**

<table>
<thead>
<tr>
<th>Advising</th>
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<tr>
<td>Worksheets</td>
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<th>Forms</th>
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<td>Form submission windows</td>
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<td>Funding renewal applications</td>
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<tr>
<td>Independent study applications</td>
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<tr>
<td>Internship applications</td>
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<tr>
<td>Qualifying exam sign-ups</td>
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<tr>
<td>Summer funding applications</td>
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<td>Teaching surveys</td>
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</table>

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<th>Users</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>➔ Change</td>
</tr>
<tr>
<td>Non-math faculty</td>
<td>➔ Change</td>
</tr>
<tr>
<td>Staff</td>
<td>➔ Change</td>
</tr>
<tr>
<td>Students</td>
<td>➔ Change</td>
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</tbody>
</table>
• The **Advising Worksheet** is the main one you need to complete with consultation of your academic advisor to update your two-year coursework plan at the beginning of the fall semester, each year.
• The Forms section consists of forms you will be informed to complete at a certain time during the academic year.
  o CST Research Assistant Application Form will be sent to all graduate students around February.
  o Funding Renewal Application Form will be sent to funded students around February and March each year for BOTH summer appointment request and funding renewal of the next fall semester.
  o Independent Study Application Form is required if you plan to take an independent study course to substitute for a regularly offered course (not MTH/STA 597, 697 or 797).
  o Internship Application Form is for teaching internship application. It is for Ph.D. students who have completed all three qualifying exams and have taken MTH 761.
  o Qualifying Exam Sign-up Form: There have two sign-up periods for qualifying exam. One is for the January exam and one is for August Exam. For January Exam, the sign-up e-mail message will be sent around October, and the around March for the August exam.
  o Teaching Survey: This is for teaching assistants only. It is a form to ask for your class schedule you will be taking in the next fall semester, in order for the department to properly assign your teaching duty.
Appendix B: Instruction for conducting RCR Training

Go to [www.citiprogram.org](http://www.citiprogram.org).
First time user: You need to register to create your Username and Password. After successful registration, enter your User name and Password to Log In.

Click on ‘Add a Course or Update Learner Groups’, then, move the cursor down on the page to see the bottom part of the page.

Click on Responsible Conduct Research (RCR) Courses, then, Next,
In the following page, move the cursor down to the bottom of the page to select the College.

Choose College of Science & Technology,

Next to go to the next page. Move the cursor down to the bottom to see the following
Click on the course you just added: ‘College of Science and Technology, Physical Science to begin your training.

Once complete, download your completion report and bring it to the secretary in PE 214 in order for the department to record your completion record. Please keep a copy of your completion report.
Appendix C: Graduate College Forms

The following forms can be found at http://www.grad.cmich.edu:

**Admission to Candidacy for Doctoral Degree**
Doctoral students must complete an Admission to Candidacy for Doctoral Degree form. This form should be completed after passing three qualifying examinations but prior to beginning the dissertation.

**Authorization of Degree Program**
The student and the advisor complete this form. For the M.A., the form should be completed during the first semester. For doctoral students, the form should be completed once the student has chosen an area of specialization.

**Change of Program Request**
This form must be completed by the student who is enrolled in M.A. and wants to be enrolled into Ph.D. or enrolled in Ph.D. and would like to get a M.A. instead.

**Course Substitution Request**
The student and the advisor complete this form together and the form is only needed if there is going to be a change to the courses listed on the Authorization of Degree Program form.

**Plan A & B Completion Sign-off**
This form must be completed by students pursuing a master’s degree. The student and the advisor complete this form. The form must be completed after all requirements for the degree have been completed.

**Transfer Credit Request Form**
This form must be completed by a Graduate student that has taken classes at another university or college that wants the hours to be recognized.

**Graduate Student Publication & Presentation Grant**
This grant is for any student who has research or endeavors that they would like to get published or work they would like to present at a conference. You can apply for a grant to help you out financially.

**Graduate Students Research & Creative Endeavors Grant Application**
This grant is used to help Graduate Students with cost for their research or creative endeavors.

**Dissertation Research Support Grant**
This grant provides money to offset costs associated with a student’s dissertation project.

**Graduation Application**
Prior to graduating, the student must complete a Graduation Application form and submit the form to the Office of Research & Graduate Studies. Upon receipt of this form the Office of Research & Graduate Studies will conduct a graduation audit. At this point, the student might also want to complete a Self-Audit for Graduation form.

**Prospectus (for Theses, Doctoral Projects, & Dissertations)**
This form is needed for all master’s students selecting Plan A, and for all doctoral students. The student and the dissertation/thesis advisor together will complete this form. Upon receipt of this form, the Office of Research & Graduate Studies will send the student a copy of the Preparation Guide for Doctoral Dissertations, Doctoral Research Projects and Theses.
Appendix D
CENTRAL MICHIGAN UNIVERSITY
Department of Mathematics
Course Requirement Waiver Form

NAME ___________________________________________ Student # __________

Any course requirement to be waived must be discussed with and approved by the graduate student’s academic advisor prior to being submitted to the Graduate Coordinator. If the course content is not in the specialized area of the student’s academic advisor, the advisor should consult with a content area faculty to ensure the two courses are comparable.

STATE WHICH CMU COURSE YOU WOULD LIKE TO HAVE WAIVED:

STATE THE EQUIVALENT COURSE YOU HAVE TAKEN AND AT WHAT UNIVERSITY YOU TOOK THIS COURSE:

Attach the course description and the syllabus of the course you took.

___________________________________________  ________________________
Student’s Signature  Date

Advisor’s Comments:

___________________________________________  ________________________
Advisor’s Signature  Date

Graduate Committee’s Comments:

___________________________________________  ________________________
Graduate Coordinator’s Signature  Date
Appendix E

Ph.D. Graduation Requirement

The following is a summary on the courses requirement for Ph.D. program for students coming with Bachelor degree and for students coming with Master degree

Beyond Bachelor

<table>
<thead>
<tr>
<th>Course level</th>
<th>700+</th>
<th>600+</th>
<th>Total Credit hours</th>
<th>700+</th>
<th>600+</th>
<th>500+</th>
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<tbody>
<tr>
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<td>69</td>
<td>Total Course Work</td>
<td>36</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Course level</td>
<td>700+</td>
<td>600+</td>
<td>Total course work</td>
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<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Total credit hours</td>
<td>15</td>
<td>30</td>
<td>Total Course Work</td>
<td>6 (MTH 766)</td>
<td>6 (MTH 766)</td>
<td>24 (include independent study)</td>
</tr>
<tr>
<td>Teaching Internship</td>
<td>6 (MTH 766)</td>
<td>6 (MTH 766)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissertation</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
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</table>

NOTE:
700+ include 700 & 800 level credit hours.
600+: include 600, 700 and 800 level credit hours.
- NOTE: This indicates you need to take 15 credit hours of course work at 600 level
  \[30 \text{ (at 600+) } \cdot 15 \text{ (at 700+) } = 15\]
500+: include 500, 600, 700 and 800 level credits.
- NOTE: This indicates you need to take 24 credit hours of course work in addition to the required 600+ courses. These 24 credit hours can be 500, 600, 700 or 800 level courses including independent study.

Beyond Master

<table>
<thead>
<tr>
<th>Course level</th>
<th>700+</th>
<th>600+</th>
<th>Total Credit hours</th>
<th>700+</th>
<th>600+</th>
<th>500+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total credit hours</td>
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<td>Total Course Work</td>
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<tr>
<td>Total credit hours</td>
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<td>Total Course Work</td>
<td>6 (MTH 766)</td>
<td>6 (MTH 766)</td>
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<tr>
<td>Teaching Internship</td>
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</tr>
<tr>
<td>Dissertation</td>
<td>15</td>
<td>15</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

NOTE:
1) This indicates there is no required course at 600 level: \[15 \text{ (at 600+) } \cdot 15 \text{ (at 700+) } = 0\]
2) You need to take 24 credit hours of course work in addition to the required 600+ courses. These 24 credit hours can be 500, 600, 700 or 800 level courses including independent study.

Courses for Ph.D. Qualifying Exams

1. Algebra (MTH 623, 625)
2. Analysis (MTH 632, 636)
3. Applied Mathematics (MTH 520 or 586, 638)
4. Applied Statistics (STA 590, 682)
5. Combinatorics (MTH 578, 678)
6. Mathematics Education (MTH 761, 762)
7. Theoretical Statistics (STA 584, 684)
8. Topology (MTH 644, 645)
Advices to Ph.D. students on planning the course work:

- Take the pre-requisite courses, if not yet fulfill (e.g., MTH 523, MTH 525, MTH 533)

  NOTE: This is particularly important for conditionally admitted students

- Take courses that are for qualifying exams

**Students came with a Bachelor degree:**

700+ level: at least 15 hours are from:
  - (a) MTH 761, MTH 762,
  - (b) Independent Study (MTH 697 or STA 697), other 700 level courses.

600+ level courses: at least 30 credit hours are from:
  - (a) 15 hours from 700+
  - (b) 15 credits are at 600 level:
    - 6 hours from Algebra Core (MTH 623, MTH 625)
    - 9 hours from (MTH 632, MTH 633, MTH 636, MTH 637)
  - (c) Independent study
  - (d) Area specified courses

Other 500+ level courses: 24 credit hours are from
  - (a) MTH 525,
  - (b) 21 hours from the Core Electives
  - (c) Independent Study
  - (d) Area specified courses (3-9 can be from disciplines different from MTH or STA)

**Students came with a Master degree:**

700 level: at least 15 hours are from:
  - (a) MTH 761, MTH 762,
  - (b) Independent Study (MTH 697 or STA 697), other 700 level courses.

600+ level courses: at least 15 credit hours are from:
  - (a) 15 hours from 700+
  - (b) 600 level courses from Core Course I requirement.
  - (c) Independent study
  - (d) Area specified courses

Other 500+ level courses: 24 credit hours are from
  - (a) MTH 525,
  - (b) 600 level courses from Core Course I requirement.
  - (c) 21 hours from the Core Electives
  - (d) Independent Study
  - (e) Area specified courses (3-9 can be from disciplines different from MTH or STA)