MATH 420-01-LEC (04814) 3 credits, Summer 2020

**Instructor:** Associate Professor Mary Townsend **E-mail:** mary.townsend@mayvillestate.edu

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**Instructor:** Mary Townsend **Office Location:** Classroom Building 108A

Given my rank at MSU and my degree, I prefer to be called **Professor Townsend**. You may call me Miss Townsend or Mrs. Townsend and use female pronouns: she and her.

**Hours of Availability:** by appointment made by e-mail (my preferred method of communication)

**Time Zone:** All times indicated throughout this syllabus reflect Central Time (CT).

**Instruction Mode:** online **Meeting Times/Location**: online

# Course Description: This course examines the history of mathematics developed from a conceptual as well as a chronological point of view. Mathematics will be studied as both a science and an art depending on the perspective of different philosophies of math. A computer presentation utilizing a database of internet research will be this course’s final project.

# Course Prerequisite: Math 103: College Algebra

# Required Text: *The Math Book: From Pythagoras to the 57th Dimension, 250 Milestones in the History Mathematics* by Clifford A. Pickover (2009).

# Recommended Text: *The Math Book: Big Ideas Simply Explained* by Toucan Books in Great Britain by Darling Kindersley Limited (2019).

# Additional required articles will be posted in Blackboard for this course. Students will also do research with books, online articles, and other sources depending on the topics selected for mini-presentations and the final project.

# Purpose of the Course: Students will read text, additional books and articles, utilize technology and library resources as they research the lives and works of mathematicians, scientists and the historical development of mathematical concepts. As students prepare and present information about mathematicians and mathematical concepts, they are expected to develop an appreciation of mathematics and be able to communicate different philosophies of mathematics and various ways to communicate mathematical content depending on the age and skill level of the learner.

**Course Objectives:** The objective of the course is for students to demonstrate a knowledge of the most important and most interesting concepts regarding the history and philosophy of mathematics, the branches of mathematics, and the connections between mathematical and technological advances. Students will develop communication skills as they present what they have learned about the history and philosophy of mathematics in an engaging manner both as a paper and by utilizing technology.

**Program Student Learning Outcomes (SLOs) Addressed in this Course:** The Academic Program Student Learning Outcomes document can be found in your Blackboard course shell. It contains all learning outcomes pertaining to Essential Studies courses and all majors and minors. The document has an index so you can quickly find the degree you are pursuing.

**Mathematics and Mathematics Education Program Student Learning Outcomes (SLOs) Addressed:**

 SLO 1: Students will acquire a content knowledge base commensurate with career goals.

 SLO 2: Students will communicate mathematics information both orally and in writing.

 SLO 3: Students will apply mathematics in context, including at least one experiential situation, to solve problems.

 SLO 4: Students will construct and critically analyze mathematical arguments.

## **Program Student Learning Outcomes (SLOs) Addressed in This Course (required)**

The Academic Program Student Learning Outcomes document can be found in your course shell. It contains all learning outcomes pertaining to Essential Studies courses and all majors and minors. The document has an index, so you can quickly find the degree you are pursuing.

As part of Mayville State’s effort to demonstrate continuous improvement in achieving student learning outcomes, this course:

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| --- | --- | --- | --- |
| [ ]  introduces SLO # [x]  reinforces SLO # 1 and 3[ ]  masters SLO #For Major / Minor:   | [ ]  introduces SLO #[x]  reinforces SLO # 1 and 3[ ]  masters SLO #For Major / Minor:  | [ ]  introduces SLO # [ ]  reinforces SLO #[x]  masters SLO # 2For Major / Minor:  | [ ]  introduces SLO # [ ]  reinforces SLO #[x]  masters SLO # 2For Major / Minor:  |

**Course Improvements Based on Most Recent Assessment Findings:** This course will be assessed the fall of 2020 for SLO 2 using the final project paper and presentation as the assessment activity. Findings will be reported in future syllabi.

**Instructional Technologies Utilized:**

* Blackboard is MSU’s learning management system and virtual class environment.
* Graphing calculators, computer software including Wolfram Alpha and online training resources including Atomic Learning and Khan Academy provide ways for students to utilize technology to understand, solve, and graph solutions.
* Students may use Yuja videos, PowerPoint, YouTube and/or other presentation software to submit their presentations with both audio and text.
* Students may conference with one another and/or the professor by phone, Zoom, e-mail or Skype for Business.

**Instructional Strategies**

* The instructor will provide topics for study and guide the students as they select a final project topic and complete five final project check points (FPCPs) to prepare to submit a final research paper and presentation near the end of the semester. Detailed feedback will be provided. The instructor will provide short quizzes related to common grammar errors, APA format, and reflection papers on their research as they learn to manage the workload of a research paper and presentation.
* The instructor will guide students as they prepare to write and present a 10 – 30-page final paper and a 15 – 45-minute presentation on an approved topic about a mathematician who has significantly contributed to the advancement of mathematics. Rubrics will be provided at the beginning of the course regarding how the final paper and presentation will be graded.
* The instructor will provide an overview of readings and provide opportunities for students to demonstrate that they understand the main ideas by completing quizzes online, by discussing the content in discussion forums with peers and in reflection journals submitted to the instructor.
* The instructor will guide students as they complete three or more mini-presentations to convey course content in an engaging and meaningful way. The instructor will also provide surveys for students to evaluate one another’s mini-presentations, facilitate discussions in discussion boards regarding the mini-presentations and final projects with short reflection journals to monitor the learning of each student.
* Assignments will be grouped in folders in Blackboard with designated due dates. Students may work ahead in this course, and extensions may be provided if students need additional time to complete assigned work.

**Learning Experiences**

* Students will read information from the text and other sources as they prepare to present three or more mini-presentations on topics of the history and philosophy of mathematics, branches of mathematics, and applications of mathematics, and technology associated with mathematics.
* Students will learn by reading, presenting information, evaluating their work and the work of peers, collaborating with peers, answering quiz questions, and by feedback on journals and presentations by peers and the professor.
* Students will practice citing and referencing sources using APA format in online Blackboard quizzes, mini-presentations and rough drafts of their final paper and presentation.
* Students will submit rough drafts of their papers for final project checkpoints 2 - 5 to the writing center and to at least one peer as they develop communication skills using APA format.

**Expectations/Protocols:** Students are expected to display academic honesty and respect for themselves, their classmates, their instructor and the Mathematics department. For each mini-presentation, students will evaluate themselves and at least 3 peers by providing constructive comments and ideas to improve future presentations and papers in APA format. Students will complete activities by the due dates and provide meaningful feedback to one another. Students are expected to write using complete sentences in paragraph form as they evaluate one another and contribute opinions and experiences in discussion forums.

**Instructor/Student Communication:** Students may submit questions or concerns by e-mail to the instructor at mary.townsend@mayvillestate.edu or schedule a time to meet with the instructor. Students are account-able for all academic communications sent to their Mayville State University e-mail address. Students can expect a reply to their e-mailed questions within 48 hours. Any exceptions to this will be posted in Blackboard Announcements.

**Evaluation:** Grading will be based on graded assignments including the top three mini-presentations (15%) and evaluations of peers’ mini-presentations (5%), quizzes (20%), online discussions postings and reflection journals (10%), final project checkpoints (rough drafts) of the final presentation and paper (10%), final paper (20%), and final presentation (20%). The grading scale will be:

A 90 -100% B 80 - 89% C 70%-79% D 60-69% F 0-59%

* **Mini-Presentations (15%):** Students will utilize technology to communicate research of mathematicians and mathematical concepts as they present three or more 5-minute to 15-minute mini-presentations on approved topics.
* **Evaluations of Mini-Presentations, Papers, and Final Presentations (5%):** Students will use a Qualtrics survey to provide feedback on their own presentations and the presentations of their peers for all mini-presentations. Students will evaluate all of the final papers and final presentations including their own final project. Students will also provide feedback in a Qualtrics survey after each phase of mini-presentations and the final presentations to provide feedback to the class regarding their opinions about the best three presentations, what they learned about presenting information about the history and philosophy of mathematics, which presenters have made improvements, and general comments about what they learned.
* **Online Quizzes (20%):** Students have the opportunity to answer questions on each online quiz as often as they want. The highest grade on each quiz will be used. Quizzes will remain open throughout the semester for students to improve their scores.
* **Online Discussion Postings and Summarizing Journal (10%):** Students will participate in online discussions on mini-presentations, readings, and final presentations. The purpose is to engage critical thinking, practice problems related to the topic, and to make connections between current topics and previous experiences and knowledge. Students will ask and answer questions to demonstrate that they are learning about the history and philosophy of mathematics.
* **Final Project Checkpoints (FPCPs) (10%):** Students will demonstrate progress on their final presentation and paper with five checkpoints.
	1. Share 5 source references using APA format and an annotated bibliography of at least 10 facts about the selected mathematician in the discussion forum. (20 points, due after week 2)
	2. Submit a rough draft of one section of the final paper with a title page, the background section **and/or** mathematical contributions section of the topic, and a reference page. Submit a PowerPoint with at least 5 images that will be used in the final presentation and a reference slide noting the sources of the images used. (30 points, due after week 4)
	3. Submit a rough draft of the final paper with a title page, the background section **and** mathematical contributions section of the topic, and a reference page. Submit a PowerPoint with at least 10 images that will be used in the final presentation and a reference slide noting the sources of the images used. (50 points, due after week 6)
	4. Submit the rough draft of your entire final paper (10 – 30 pages) and presentation (10 – 30 slides and 15 – 45 minutes) including the connections between the topic and mathematicians before, during, and after the contributions of the given mathematician. (50 points, due after week 7)
	5. Submit completed rubrics on the presentation and paper with the final draft of the final paper and presentation that incorporates suggested changes after FPCP 4. (100 points, due after week 8)
* **Final Presentation (20%):** The final presentation is worth 200 points. A rubric will be used to grade the final presentation, which should be at least 10 slides and no more than 50 slides with 15 – 45 minutes of audio.
* **Final Paper (20%):** The final paper is worth 200 points. A rubric will be used to grade the final paper which should be at least 10 pages and no more than 30 pages in length.

Students are encouraged to work ahead of the unit deadlines. Students are encouraged to share their experiences with others to provide more opportunities to dig deeper and to make connections between concepts. Students should expect to spend at least 12 hours per week watching and creating presentations, reading and researching, viewing PowerPoint presentations, doing quizzes, participating in discussion forums, writing journal reflections, evaluating and preparing for the final paper and presentation.

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| Activity | No. of Occurrences | Points Possible | Percent of Total |
| Mini-Presentations | Best 3 of 7 | 90 | 15% |
| Evaluations | varies | varies | 5% |
| Online Quizzes | varies | varies | 20% |
| Discussion Posts/Journals | varies | varies | 10% |
| Final Project Check Points | 5 | 250 | 10% |
| Final Paper | 1 | 200 | 20% |
| Final Presentation | 1 | 200 | 20% |

**Enrollment Verification:** The U.S. Department of Education requires instructors of online courses to provide an activity which will validate student enrollment in this course. The only way to verify that a student has been in this course is if he or she takes an action in Blackboard, such as completing an assignment or a taking a quiz. Logging into Blackboard is **NOT** considered attendance. Please see the enrollment verification activities (the syllabus quiz, the introduction forum, and the 6 critical questions in the Week 1: Introductions section) and complete it by the date indicated (Friday, 5/29/20 at noon). If it is not complete your enrollment in this course will be at risk.

**Proctor Notification:** This course does not require a proctor since there are no exams in this course.

**Late Arrivals:** The grading system for students adding this course after the first day of instruction will not be modified. Students will be graded on all the activities regardless of the date of enrollment in the course. Students will not be penalized for late assignments if enrollment occurs after the due date of the assignment, but the students are still responsible for completing the course material that was covered during their initial absence. Arrangements can be made for new due dates.

**Important Student Information**: Important student information can be found on the Blackboard page for this course under the “Important Student Information” link.

* Academic Grievance Concerns and Instructor English Proficiency
* Starfish - Student Success System
* Students with Documented Disabilities
* Academic Honesty
* Emergency Notification
* Continuity of Academic Instruction for a Pandemic or Emergency
* Family Educational Rights and Privacy Act of 1974 (FERPA)
* Diversity Statement

**The consequences for committing academic dishonesty** in this course will include the raising of a Starfish flag for academic dishonesty for each infraction. For the first infraction, the student will receive a grade of F with a maximum of 50% on the assignment with no opportunity to redo the assignment. For a second infraction, the student will receive an F for the course. If a third infraction occurs, the student will be referred to the vice president of academic affairs for further disciplinary action.

**Diversity:** Diversity issues will be addressed whenever appropriate. This classroom and online environment is a place where students will be treated with respect, and the course instructor welcomes individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability, and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. Mayville State University is committed to providing a safe learning environment, free of harassment and discrimination as articulated in our university polices at <http://www.mayvillestate.edu/about-msu/consumer-information/title-ix/>. The policies at Mayville State require faculty members to share information about incidents of gender-based discrimination and harassment with the Title IX coordinator regardless of whether the incidents are stated in person or shared by students as part of their coursework.

The full list of course activities will be in Blackboard. There will be a folder for each due date and a summary of the activities and due dates at the top of each folder. Students are encouraged to complete work as it is assigned. There will typically be a full week between the assignment and the due date with a few exceptions such as the enrollment verificiation folder (which is due on Friday of the first week of class).

| **Week** | **Dates** | **Math 420 Tentative Summer 2020 Schedule** |
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| 1 | M 5/25 | Memorial Day: No scheduled classes. |
| 1 | W 5/27 | * Complete the enrollment activities: Intro to the Course: 6 Critical Questions, Introduction Forum, and Syllabus Quiz.
* Watch PowerPoint on final topic selection. Begin quizzes on top 30 mathematicians.
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| 1 | F 5/29 | * Submit Enrollment Verification Assignments by noon on Friday, 5/29
* Begin to reading A: Pickover pages 5 – 79; do quizzes and submit discussion board posts on dedication, quotations, contents, **150 BC to 415 AD**

**(Ancient and Classical Periods 6000 BC – 500 AD)** |
| 2 | M 6/1 | * Watch PowerPoint presentation to learn APA format. Do APA Quiz.
* Learn about using the Writing Center by watching PowerPoint and make an appointment to learn about citing sources and images.
* Submit your final project topic to the discussion board and start finding sources for your final project topic; work on annotated bibliography FPCP 1.
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| 2 | W 6/3 | Begin reading B: Pickover pages 50 – 159; do quizzes and submit discussion board posts on Pickover **80 to 1680 AD (The Middle Ages 500 – 1500)** **(The Renaissance 1500 – 1680)** |
| 2 | F 6/5 | Reply to posts of peers for weeks 1 – 2 in discussion boards. Work on FPCP 1. |
| 3 | **M 6/8** | **Submit FPCP 1 to discussion board by Monday, 6/8.** Share 5 source references using APA format and an annotated bibliography of at least 10 facts about the selected mathematician in the discussion forum.  |
| 3 | W 6/10 | Begin reading C: Pickover pages 160 – 205; do quizzes and submit discussion board posts on Pickover **1665 to 1797 AD (The Enlightenment 1680 – 1800)** |
| 3 | F 6/12 | Work on first mini presentation; get feedback from peers in discussion board.  |
| 4 | M 6/15 | Mini Presentation A or B is due from an approved topic before 1680.  |
| 4 | W 6/17 | Begin reading D: Pickover pages 206 – 297; do quizzes and submit discussion board posts on Pickover **1801 to 1899 AD (The 19th Century 1800 – 1900)** |
| 4 | F 6/19 | Work on FPCP 2. Get feedback from peers and writing center.  |
| 5 | M 6/22 | **Submit FPCP 2 to discussion board by Monday, 6/22.** The title page, reference page and one section of the paper are due. You should have evidence of help from the writing center. At least 5 images or illustrations should be included in a PowerPoint presentation with citations in rough APA format.  |
| 5 | W 6/24 | Begin reading online sources about branches of mathematics and choose groups for mathematical branches mini-presentation. |
| 5 | F 6/26 | Work on second mini-presetation; get feedback from peers in discussion board. |
| **6** | M 6/29 | Mini Presentation C or D is due from an approved topic before 1900.  |
| 6 | W 7/1 | Begin reading E: Pickover pages 298 – 405; do quizzes and submit discussion board posts on Pickover **1900 to 1950 AD (Modern Mathematics 1900 – )** |
| 6 | F 7/3 | Work on FPCP 3. Get feedback from peers and writing center. |
| 7 | M 7/6 | **Submit FPCP 3 to discussion board by Monday, 6/8.** The title page, reference page and two sections of the paper are due. You should have evidence of corrections since FPCP2 and more feedback from the writing center. At least 10 images or illustrations should be included in a PowerPoint presentation with citations in better APA format. |
| 7 | W 7/8 | Begin reading F: Pickover pages 406 – 517; do quizzes and submit discussion board posts on Pickover **1951 to 2007 AD (Modern Mathematics 1900 – )** |
| 7 | F 7/10 | Work on FPCP 4. Get feedback from peers and writing center. |
| 8 | M 7/13 | **Submit FPCP 4 to discussion board by Monday, 7/13.** The title page, reference page and three sections of the paper are due. You should have evidence of corrections since FPCP3 and more feedback from the writing center. At least 15 images or illustrations should be included in a PowerPoint presentation with citations in better APA format. |
| 8 | W 7/15 | Submit and evaluate group or individual mini-presentations on philosophies of mathematics and/or timelines.  |
| 8 | F 7/17 | Make corrections and finish FPCP 5.  |
| 9 | M 7/20 | **Submit FPCP 5 (rough draft of paper and presentation) to discussion board by Monday, 7/20.** The presentation should have audio and be between 15 and 45 minutes in length; the paper should have evidence of corrections since FPCP 4.  |
| 9 | W 7/22 | Submit and evaluate OPTIONAL mini-presentations on reading E (to replace a low score on previous mini-presentation). |
| 9 | F 7/24 | Make final changes to final paper and final presentation. |
| 10 | M 7/27 | **Final presentation and final paper are due.** Evaluate the final presentations and papers of your peers. |
| 10 | W 7/29 | Submit and evaluate OPTIONAL mini-presentations on topics in F (to replace a low score on previous mini-presentation). |
| 10 | F 7/31 | Evaluate mini-presentations.  |
| 11 | M 8/3 | Complete final journal of what you learned in this course.  |