 **Math 142 – Precalculus II**

**Spring Quarter 2024**

Instructor: Angela Frye Telephone:

Room: 205 Email: afrye@freemansd.org

Prep Period: 9:10 – 10:00 am

**\*Please turn off and put away cell phones before entering class. Texting or listening to electronic devices is prohibited once you enter the classroom. Using a prohibited device during an assessment will result in a grade of 0 on that assessment.**

Textbook: *Precalculus: Mathematics for Calculus*, seventh edition, by Stewart, Redlin, and Watson.

Course Description: This course includes modeling, rates of change and structure of functions; especially polynomial, rational, logarithmic and exponential. Problem solving, use of graphing tools and abstract reasoning are emphasized throughout the course.

Homework: Generally, 2-3 hours of outside work is required for every hour of class time; this will vary among students depending upon their level of academic preparation. Homework will not be graded, but you should ask any questions you have about the homework problems. If you need more practice, work more problems.

Attendance: Regular attendance and participation is expected and appreciated.

Quizzes: There will be in class quizzes every Friday (or the last day of the school week). Quizzes should be made up if they are missed as soon as possible. Each quiz should be a learning experience. They shouldn’t be painful. You may retake quizzes up until exam day.

Calculators: For some of your homework problems you will need to use technology to graph. A TI-84 graphing calculator is recommended. If you do not have a graphing calculator there are calculators in my room that you may borrow for the class period. **TI-89, TI-92, HP 48G, or calculators with a built-in library or symbolic manipulation capability are not allowed on exams or quizzes**. Calculators will be prohibited on many quizzes and exams, so be sure that when you’re doing something with your calculator, you understand it well enough to do it without as well.

Tests: Four exams will be scheduled throughout the quarter, as well as a comprehensive final exam. In general, no make-up exams will be given. If you cannot make it to an exam at the scheduled time, please try to notify me in advance. If you are sick on an exam day, you will be expected to make up the exam the day you return. Please note the date of the final exam on the attached schedule, this date is not negotiable.

\*If you score 80% or more on the final exam then your final exam score can replace a lower exam score.

# Grading: Grades will be based on the following information:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Net Score (%)** | **Grade** | **Net Score (%)** | **Grade** | **Net Score (%)** | **Grade** |
| 93-100 | A | 80-82 | B- | 67-69 | D+ |
| 90-92 | A- | 77-79 | C+ | 63-66 | D |
| 87-89 | B+ | 73-76 | C | 60-62 | D- |
| 83-86 | B | 70-72 | C- | 59 or below | F |

# 4 Exams 60%

# Quizzes 15%

Final 25%

**Grades will be kept on Canvas and Skyward. Please check your grades periodically and let me know before the final exam if you find an error.**

Misconduct: Conduct in the classroom must not distract from the learning experience for students in the class nor disrupt the ability of the teacher to teach. Tardiness is distracting. Misconduct will be sanctioned according to the Student Conduct Code.

Academic Integrity:

Academic Integrity is the corner stone of the university. Any student who attempts to gain an unfair advantage over other students by violating the Academic Integrity policy may be reported to the university and may receive a sanction up to and including XF for the course, suspension, or expulsion from the university. This policy is on the EWU web site. <https://sites.ewu.edu/policies/policies-and-procedures/wac-172-90-student-academic-integrity-3/>

Tutoring: If you need any extra help, please sign up for Scottie Time or come in before school or after school. Do not wait to get help if you are struggling.

Equal Opportunity Statement:   
EWU does not discriminate on the basis of race, color, creed, religion, national origin, sex, pregnancy, sexual orientation, gender identity/expression, genetic information, age, marital status, families with children, protected veteran or military status, HIV or hepatitis C, status as a mother breastfeeding her child, or the presence of any sensory, mental, or physical disability or the use of a trained guide dog or service animal by a person with a disability, as provided for and to the extent required by state and federal laws.   
  
Affirmative Action Statement:   
Eastern Washington University adheres to affirmative action policies to increase the number and retention of students and employees from historically underrepresented groups.   
  
Disability Support and ADA:Your ability to succeed in this class is important to me. If you already have an accommodation plan through Student Accommodations and Support Services (SASS) and would like to use your approved accommodations in this class, please let me know as soon as possible. If you do not have an accommodation plan but have a temporary health condition or permanent disability that may require an accommodation, please contact the SASS office at [dss@ewu.edu](mailto:dss@ewu.edu) or 509-359-6871. You can also visit their website at <https://inside.ewu.edu/dss/>.

Religious Accommodations: If you would like to request an accommodation for reasons of faith or conscience, please refer to EWU’s policy on Holidays and Religious Accommodations available at <https://inside.ewu.edu/policies/>. Accommodations must be requested within the first two weeks of this course using the Holidays and Religious Accommodations Request form available at <https://inside.ewu.edu/student-life/resources/holidays-and-religious-accommodations-request/>.

Other General Information: This is a 5-credit course that serves as a prerequisite for Math 142. We will discuss functions in a general sense as well as polynomial functions, rational functions, exponential functions, logarithmic functions, and systems of equations and inequalities. You must complete the course with a C or better to move on to Math 142. Some majors require higher than a C. Students earning the minimum score often struggle in subsequent courses, so you should do your best to earn the maximum score possible rather than the minimum.

**A note on homework…**

The purpose of the homework is to understand the concepts presented in class more thoroughly. Do your homework with the **intent of understanding it, not just completing it**. In order to be successful in this class and future mathematics classes, you will need to understand the concepts presented, not just memorize them. As with any college course, you should plan to spend time in and outside of class completing homework and studying. Write any questions you have in the margin next to the problem or in your notes. Be sure to have answers to these questions before the exam. If you are having a difficult time, be sure that you are utilizing all of your resources including Scottie Time, online help (YouTube and Khan Academy), and fellow students. If you get help (from the back of the book, online, a friend,) be sure that you can do the problem on your own without hints or help. Some people need to do homework problems several times before they understand them. As far as what your written homework should look like, I want it to be something that you could use to study for your exam. That means that in most cases the problems are written out, and in the case of long word problems, the important information is written down. Your work should be neat and easy for someone else reading to follow, using correct mathematical notation. Just writing down the answer to a problem is not sufficient.

*EWU expands opportunities for personal transformation through excellence in learning*.

**Math 142 Calendar 2023-2024**

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| --- | --- | --- | --- |
| **Week** | **Dates** | **Sections** | **Topics** |
| 1 | Jan 29-Feb 2 | 5.1-5.3 | Unit circle, trigonometric functions of real numbers, trigonometric graphs |
| 2 | Feb 5-9 | 5.4-5.6 | More trigonometric graphs, inverse trig functions and graphs, modeling harmonic motion |
| 3 | Feb 12-16 | 6.1, Exam 1 | Angle measures |
| 4 | Feb 20-23 | 6.2-6.3 | Trig of right triangles, trig functions of angles |
| 5 | Feb 26-29 | 6.4-6.5 | Inverse trig functions and right triangles, law of sines |
| 6 | Mar 5-8 | 6.6-7.1 | The Law of Cosines, trig identities |
| 7 | Mar 11-15 | 7.2-7.3 | Addition and subtraction formulas, double-angle, half-angle, and product-sum formulas |
| 8 | Mar 18-22 | Exam 2, 7.4 | Basic trig equations |
| 9 | Mar 25-27 | 7.5 | More trig equations |
|  | Apr 1-5 |  | Spring break |
| 10 | Apr 8-12 | 8.1-8.3 | Polar coordinates, graphs of polar equations, polar form of complex numbers |
| 11 | Apr 15-19 | 8.4, 9.1, Exam 3 | Plane curves and parametric equations, vectors in two dimensions |
| 12 | Apr 22-26 | AP Review |  |
| 13 | Apr 29-May 3 | AP Practice Test |  |
| 14 | May 6-10 | 11.1-11.3 | Parabolas, ellipses, hyperbolas |
| 15 | May 13-17 | 11.4, 12.1-12.2 | Shifted conics, sequences and summation notation, arithmetic sequences |
| 16 | May 20-23 | 12.3, Exam 4 | Geometric sequences |
| 17 | May 28-31 | 12.5 | Mathematical Induction |
| 18 | Jun 3-7 | Final Exam Review |  |
| 19 | Jun 10-14 | Final Exam Review, Final Exam |  |

The following objectives will give you an idea of the content that will be discussed this quarter, but they are not the entire focus of the course. In addition to being proficient in these objectives you will improve your problem solving and communication skills throughout the quarter. Since this course is meant to prepare you for Calculus you will have the opportunity to think about functions and their graphs in different ways that you have before, especially when dealing with asymptotes. We will justify results more rigorously and explain details more thoroughly. You will have the opportunity to take a concept or skill that you have learned and apply it in a new context. You will work individually and as the member of a team.

We will also make use of the **Standards for Mathematical Practice**:

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

**Math 142 Course Objectives:**

**Trigonometric Functions:**

1. Students will use the unit circle, reference numbers, and terminal points to evaluate trigonometric functions.
2. Students will memorize and be able to use fundamental trigonometric identities.
3. Students will be able to determine amplitude, period, and phase shift of equations of the form *y = a* sin *k(x - b)* and *y= a cos k(x - b)* and sketch the graph of the function.
4. Students will be able to determine period and phase shift for functions of the form *y = a* tan ***kx*** and *y =* acot kx.
5. Students will graph the reciprocal functions of sine, cosine and tangent functions.

**Trigonometric Functions of Angles:**

1. Students will understand radian measure of angles and convert between radians and degrees.
2. Students will calculate arc length and areas of sectors.
3. Students will use the trigonometry of a right triangle to solve problems involving missing or unknown parts of a right triangle.
4. Students will use reference angles to evaluate trigonometric functions at any angle.
5. Students will be able to apply the law of sines, law of cosines, and Heron's formula to solve problems involving triangles.

**Analytic Trigonometry**

1. Students will apply fundamental trigonometric identities to verify other identities.
2. Students will manipulate inverse trigonometric functions.
3. Students will solve trigonometric equations by algebraic methods and by using identities.
4. Students will write complex numbers in trigonometric form.
5. Students will add and subtract vectors, multiply vectors by scalars, and determine magnitude of vectors.
6. Students will solve application problems involving vectors.

**Conic Sections:**

1. Students will know and be able to use geometric definitions of parabolas, ellipses and hyperbolas.
2. Students will be able to graph shifted conic sections.
3. Students will be able to identify degenerate conics.

**Polar Coordinates**

1. Students will demonstrate the relationship between polar and rectangular coordinates.
2. Students will graph polar equations.

**Parametric Equations:**

1. Students will sketch curves represented by parametric equations.
2. Students will express polar equations in parametric form.

**Sequences and Series:**

1. Students will identify a sequence as arithmetic or geometric, write an expression for the general term, and evaluate the sum of a series based upon the sequence.
2. Students will construct terms of a series from the general formula.
3. Students will solve application problems involving sequences and series.
4. Students will use mathematical induction to prove statements about numbers and sums of *n* numbers from a sequence.