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**MAT115 - 2 : Pre-Calculus**

Spring, 2020

Monday 12:00 P.M. – 1:50 P.M. (E103)

Wednesday 12:00 P.M. – 1:50 P.M. (E103)

Syllabus

**Instructor:** Dr. Young Mee Oh

**Title:** Pre-Calculus

**Office:** Faculty Office

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**Office Hours:** Mondays and Wednesdays: 9:00 A.M. - 10:00 A.M. (Faculty Office)

Mondays and Wednesdays: 3:30 P.M. - 4:00 P.M. (Faculty Office)

Tuesdays: 12:00 P.M. - 1:00 P.M. (Academic Resource Center)

Thursdays: 1:00 P.M. - 2:00 P.M. (Academic Resource Center)

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**Course Description**

Pre-calculus (MAT115) is a 4-credit course and the students will receive a letter grade at the end of the course. This course covers polynomial, rational, logarithmic, exponential, and trigonometric functions, including elementary operations with Vectors. Topics for each type of function will include finding roots, graphing and modeling using applications from physics and engineering. This course prepares students for upper-level mathematics and science courses.

**Prerequisites**

MAT109, high school equivalent or standardized placement test

**Course Objectives**

Students will:

* Recognize and identify the graphs and forms of functions
* Describe the characteristics of functions
* Solve simple problems involving various functions and perform elementary operations with Vectors
* Apply course concepts to solve complex problems
* Analyze behaviors of various functions
* Analyze problems related to Physics and Engineering
* Evaluate solutions to application problems

**Course Outcomes**

* Students will be able to recognize and identify the graphs and forms of functions (i.e., polynomial, rational, logarithmic, exponential and trigonometric functions) as demonstrated by simple problems from homework assignments and exams.
* Students will be able to describe the characteristics of linear and quadratic functions as demonstrated by homework assignments, exams, and in-class group assignments.
* Students will be able to describe the characteristics of functions (i.e., polynomial, rational, logarithmic, exponential and trigonometric functions) as demonstrated by homework assignments, exams, and in-class group assignments.
* Students will be able to solve simple problems involving various functions (i.e., polynomial, rational, logarithmic, exponential and trigonometric functions) and perform elementary operations with Vectors as demonstrated by homework assignments, exams, and in-class group assignments.
* Students will be able to apply course concepts to solve more complex questions involving polynomial, rational, logarithmic, exponential and trigonometric functions as demonstrated by homework assignments and exams.
* Students will be able to analyze behaviors of various functions (i.e., polynomial, rational, logarithmic, exponential and trigonometric functions) as demonstrated by homework assignments, exams, and in-class group assignments.
* Students will be able to analyze and evaluate their solutions to trigonometric problems related to Physics and Engineering as demonstrated by homework assignments, exams, and in-class group assignments.
* Students will be able to evaluate their solutions to application problems as demonstrated by homework assignments, exams, and in-class group assignments.

**Course Requirements**

* Class attendance
* Pre- and Post-MAA exams
* Quizzes, exams and final exam
* Homework assignments\*

*\* Note:* Some of the assignments are required to be completed on MyMathLab

**Required Text(s)**

* Sullivan, M. (2020). *Algebra and Trigonometry (11th Ed.).* Upper Saddle River, NJ: Prentice Hall.\*\*

*\*\*Note:* An online copy of the textbook is available on MyMathLab

**Useful Materials**

* Graphing Calculator

**Useful Website(s)**

* [www.desmos.com](http://www.desmos.com)
* [www.brainfuse.com](http://www.brainfuse.com)
* [www.khanacademy.com](http://www.khanacademy.com)
* [www.paulsnotes.com](http://www.paulsnotes.com)
* [www.purplemath.com](http://www.purplemath.com)

**Electronic Resource(s)**

*Courses taught at Vaughn College may include the utilization of the D2L Learning Management System. D2L is a learning management network providing supplemental resources and an environment for additional communication and insight from peers and instructors. D2L login information can be found at* [*http://d2l.vaughn.edu/*](http://d2l.vaughn.edu/) *or through the Vaughn Portal.*

**Grading Policy**

**Grading Due Date Summary**

|  |  |  |
| --- | --- | --- |
| **Assignment** | **Due Date** | **Percentage** |
| Exam 1 | 2/24/20 | 20% |
| Exam 2 | 3/30/20 | 20% |
| Final Exam | 5/6/20 or 5/11/20 | 30% |
| Project | 4/29/20 | 10% |
| Homework Assignment | Every Class | 10% |
| Attendance/Participation | Every Class | 10% |
|  | **TOTAL** | **100%** |

**Grading Scale**

|  |  |  |
| --- | --- | --- |
| **Grade** | **Numeric Value** | **Standard** |
| A | 90-100 | Excellent |
| B+ | 85-89 |  |
| B | 80-84 | Good |
| C+ | 75-79 |  |
| C | 70-74 | Average |
| D\*\*\* | 60-69 | Min. Passing |
| F | Below 60 | Failure |

\*\*\*For Aviation Training Institute students, minimum passing grade

for all courses in the airframe and powerplant curriculum is a “C”.

**Late Work Policy**

*If a student turns in an assignment following the scheduled due date, the student will receive minimal feedback and a lower grade. Assignments turned in late will be assessed with a grade penalty. Late work will not be accepted if overdue by more than seven days.*

**Incomplete Policy**

*A grade of “I” (incomplete) is to be awarded very rarely, only when the student has not completed a small portion of the coursework due to exceptional circumstances. Granting of this grade is up to the discretion of the instructor, but is not recommended when a student has not completed significant portions of course tasks. The instructor must notify the department chair. Failure to complete the course work in a timely fashion, and to the satisfaction of the instructor, will automatically result in the conversion of an “I” grade to the grade of “F” (failure).*

**Academic Assistance**

**The Library at Vaughn College**

*Vaughn’s library offers an extensive collection of virtual and real general, technical, resource and periodical materials, including books, periodicals, journals, DVDs and research databases. In addition, the library has an e-book collection of full-text online books. In addition, the library has an e-book collection of full-text online books. All faculty, staff and students can access these databases by using their Vaughn email login and password. Vaughn email accounts are assigned by IT. Our video collection is composed of subject videos to support the College’s curriculum, general-interest videos and movies. Personal computers are available for student use.*

**The Teaching & Learning Center (TLC)**

*The TLC offers a variety of helpful programs, including peer tutoring, supplemental instruction, computer-aided instruction, mini-lectures, audio/video instructional library and workshops, as well as a quiet area to student. The TLC also houses the Academic Resource Center (ARC), the Student Advisement Center (SAC), the Writing Center and Language Lab.*

**Vaughn College Policies & Procedures**

**Academic Honesty**

*Vaughn College is committed to ensuring quality and integrity in all its academic and evaluative activities. A learning environment that promotes high academic standards is beneficial to students and faculty alike. Academic dishonesty such as cheating and plagiarism is in opposition to the values and mission of the institution and will not be tolerated.*

**Disability Support Services**

*It is the policy and practice of Vaughn College to promote inclusive learning environments. If you have a documented disability, you may be eligible for reasonable accommodations in compliance with College policy, the Americans with Disabilities Act, and/ or Section 504 of the Rehabilitation Act. Please note, students should not negotiate accommodations directly with professors; however, professors may assist students in providing information about the self-identification process and College-based services. To request accommodations or assistance, please self-identify with Frank Wang, Executive Director of Student Services at 718.429.6600 ext.163;* [*frank.wang@vaughn.edu*](mailto:frank.wang@vaughn.edu)*.*

**Absences and Lateness**

*Regular attendance is essential for satisfactory academic performance. Institutional policy mandates students missing more than three classes are subject to an overall grade decrease. Students are also advised that additional attendance requirements may be mandated depending on the faculty member and/ or the department from which a particular course is taken. The final grade in any subject may be reduced in proportion to the number of unexcused absences.*

**Discrimination and Harassment**

*Vaughn College of Aeronautics and Technology does not discriminate on the basis of age, race, color, creed, religion, national origin, citizenship status, gender, sexual orientation, marital status, disability, or status as a military veteran, or for any other category recognized by local, state or federal law. In the programs, activities, and services offered, including but not limited to admissions, recognition of performance, and achievement, which the College provides to students, staff, and applicants, it continually strives to maintain a nondiscriminatory environment.*

**Course Schedule**

***\*Course Schedule is subject to change***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Date** | **Topic** | **Assignment(s)** | | | | | |
|  |  |  | **Reading** | **Hr** | **Homework** | **Hr** | **Studying** | Hr |
| Week: 1 | 1/20 | **NO CLASS**  (Dr. Martin Luther King, Jr. Holiday) |  |  |  |  |  |  |
| 1/22 | Review | Sections:  1.1-1.2,  2.1-2.3 | 1 | Assigned problems from the sections | 2 | Review | 1 |
| Week: 2 | 1/27 | **Diagnostic Exam** |  |  |  |  |  |  |
| 1/29 | Definition and Operations with Function | Sections:  3.1,6.1 | 1 | Assigned problems from the sections | 2 | Review | 1 |
| Week: 3 | 2/3  &  2/5 | One-to-One Function; Inverse Function;  Graphical Representation of Function; Library of Functions; Piecewise Function | Sections:  6.2  3.2-3.4 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| Week: 4 | 2/10  &  2/12 | Graphing Techniques: Transformations; Graphs of Linear and Quadratic Functions | Sections:  3.5, 4.1, 4.3 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| Week: 5 | 2/17 | **NO CLASS**  (Presidents Day Holiday) |  |  |  |  |  |  |
| 2/18  &  2/19 | Introduction to Trigonometry and Vectors I;  Review for Exam 1 | Sections:  7.1-7.3, 10.4 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| Week: 6 | 2/24  &  2/26 | **EXAM 1;**  Polynomial and Rational Functions | Sections:  5.1-5.2 | 2 | Assigned problems from the sections | 2 | Study for Exam 1 | 4 |
| Week: 7 | 3/2  &  3/4 | Graph of Rational Functions; Polynomial and Rational Inequalities (optional) | Sections:  5.3-5.4 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| Week: 8 | 3/9  &  3/11 | Exponential and Logarithmic Functions; Properties of Logarithms | Sections:  6.3-6.6 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| Week: 9 | 3/16  &  3/18 | Logarithmic and Exponential Equations;  Review for Exam 2 | Sections:  6.6 | 2 | Assigned problems from the sections | 2 | Review | 4 |
| Week: 10 | 3/23  &  3/25 | **NO CLASS**  (Spring Recess) |  |  |  |  |  |  |
| Week: 11 | 3/30  &  4/1 | **EXAM 2;**  Trigonometric Functions of Any Angle; Unit Circle Approach; Properties of Trigonometric Functions | Sections:  7.4 - 7.5 | 2 | Assigned problems from the sections | 2 | Study for Exam 2 | 4 |
| Week: 12 | 4/6  &  4/8 | Graphs of the Sine and Cosine Functions; Phase Shift; Graphs of the Tangent Function (Cotangent, Cosecant, and Secant Functions (optional)); Graphs of Trigonometric Functions using MATLAB | Sections:  7.6 - 7.8 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| Week: 13 | 4/13  &  4/15 | Trigonometric Identities; Review for EXAM 3 | Sections:  8.4 | 2 | Assigned problems from the sections | 2 | Review Sheet | 4 |
| Week: 14 | 4/20 | **EXAM 3** |  |  |  |  | Study for Exam 3 | 4 |
| 4/22 | Inverse of Trigonometric Functions; Trigonometric Equations | Sections: 8.1, 8.3 | 1 | Assigned problems from the sections | 2 | Review | 1 |
| Week: 15 | 4/27  &  4/29 | Applications of Right Triangles;  Law of Sine/Cosine (optional); Vectors (optional); Introduction to Calculus (optional); | Sections: 8.3, 9.1 - 9.3, 10.4-10.5, 12.5, pgs.331,334, 205, 234 | 2 | Assigned problems from the sections | 4 | Review | 2 |
| 4/29 | **Project Due** |  |  |  |  |  |  |
| Week: 16 | 5/4 &  5/6 or 5/11 | Review for Final Exam; **Final Exam** |  |  | Review Sheet | 4 | Study for Final Exam | 4 |