

UNIVERSITY OF THE INCARNATE WORD  
School of Mathematics, Science and Engineering



## COURSE SYLLABUS

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### Basic Information

Term	<b>Fall 2021</b>	
Course Title	<i>Network Security Management</i>	
Course Code	CSEC 3320	
Credit Hours	3.0	
Classroom	Building: BSH, Room: 323	
Class Schedule	Tue & Thur: 10:30 AM – 11:45 AM	
Prerequisite Course	ENGR 2340 Computer Programming for Mathematics, Sciences, and Engineering or permission of instructor. Student are required to know mathematics through calculus and matrix operations.	
Course Professor	Dr. Gonzalo De La Torre Parra	
Department Offering the Course	Computer Information Systems and Cyber Security	
Department Chair	Dr. Michael Frye	
School	School of Mathematics, Science and Engineering	
Contact Email	gdparra@uiwtx.edu	
Contact Number	(210) 829-3146	
Office and Location	Agnese/Sosa Room: 113	
Office Hours	Mon, Wed	11:00 AM – 12:00 PM
	Mon, Wed	1:30 PM – 3:00 PM
	* Also available by appointment	
Github Classroom Link	<a href="https://github.com/cyberknowledge/machine_learning">https://github.com/cyberknowledge/machine_learning</a>	
Number of Lectures	28	

## 2 Catalog Description

Intelligent information processing, search and retrieval, classification, recognition, prediction and optimization with machine learning and pattern recognition algorithms such as neural networks, support vector machines, decision trees and data mining methods, current models and architectures, implementation topics especially in software, applications in areas such as information processing, search and retrieval of internet data, forecasting (prediction), classification, signal/image processing, pattern recognition, optimization, simulation, system identification, communications, control, management and finance. Topics covered will use MATLAB and related toolboxes.

### 3 Course Overview

This course covers modern machine learning theory and techniques that can be applied to make informed data-driven decisions. Instead of manually analyzing data, machine learning offers a more efficient means to analyze large data sets to gradually improve the performance of predictive models. Machine learning algorithms are being used in a wide range of domains including image and voice recognition, finance, security, and games. These advancements are creating new jobs for data scientists, artificial intelligence and machine learning engineers

### 4 Course Resources

1. Textbook: None
2. Additional recommended materials: <https://www.deeplearningbook.org/>
3. Internet Access/Word Processing: Students will need Internet access and will require administrative access to a computer system to successfully complete the activities in this course. It is the responsibility of the student to not only have access to the internet, but to have access to a word processor (MS Office/Open Office/Google Docs) for course activities. UIW facilitates these resources on campus.
4. Email and Blackboard Learn: For this course, we will correspond using the UIW email system. Blackboard Learn may be used throughout the semester to provide a student-instructor forum for sharing information.
5. Software: MATLAB Simulink Version R2020, Statistics and Machine Learning Toolbox, Deep Learning Toolbox, and Optimization Toolbox

### 5 Course Outcomes

This course is an introductory course in machine learning for engineers. The outcomes of the course are:

- an ability to apply knowledge of mathematics, science, and engineering.
- an ability to design and conduct experiments, as well as to analyze and interpret data.
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- an ability to identify, formulate, and solve engineering problems.
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

### 6 Assessment

Course objective will be assessed by:

- Quizzes
- In-Class Exercises/Computer Exercises
- Mid-term and final course examinations of course material presented.
- Group project where each student will be evaluated by their contribution to the overall success of the project

## 7 Grading Activities, Criteria, and Guidelines

- Class Attendance: Students are expected to attend class but are provided with 3 excused absences as stated in 1.6 and it is evaluated as follows:
  - 0 - 2 absences
  - 3 absences 5% of the final grade will be deducted
  - 4 withdraw from class
  - Note: Students entering the classroom more than **15 minutes** after class starts will be **counted as being absent**
- In-Class Exercises/Computer Exercises 10%
- Assignments (15%) - Four homework assignments that enhances students research skills and enforces the concepts that students will be learning through the course. Homework assignments must be turned in on or before the prescribed due date. All Assignments due as defined in the course schedule unless I instruct it differently in class.
- Two Mid-Term Exams (15% each) - Exam will generally include multiple choice, True/False selection, fill-in the blank, and short answer questions. Material from the discussion, slides, and lecture notes will comprise most of the mid-term content.
- Group project (25%) - Microsoft Power Point slides and Presentation (23%), Group project status report (2%).
  - Status report: Each group should submit a status report in MS Word to Blackboard. The report should include current status of the project, challenges (if any) and next step.
  - Power Point: Select a topic from those we will cover in this class, or on another topic that I approve. Conduct research on this topic and prepare 12-15 slides presentation.
  - Blackboard Discussion: Post your project to Blackboard group project discussion area and be able to answer questions from your peers. Each group must provide a minimum of two comments/questions to two different groups. Each group is responsible about answering all the questions related to their project.
- Final Exam (20%) - The final exam will be given on the scheduled date per UIW final exam scheduling. This end of course exam can be over anything we have covered during the course. Please do not schedule anything that might conflict with the final exam. No one will be excused from it and there will be no make-up exam dates.

**Evaluation Criteria** Letter grades will be determined using a standard percentage point evaluation as outlined below. The final grade will be computed on the following weights:

Evaluation Event	Grade Percentage
In-Class Exercises/Computer Exercises	10
Homework Assignments	15
Mid Term Exam 1	15
Mid Term Exam 2	15
Group Project	25
Final Course Exam	20
Total	100

## 8 General Student Information

**Teaching Strategy:** This is an in person course. This means that we will meet twice a week in class unless I tell you otherwise. Please monitor your email for weekly announcements. Students are responsible about attending all classes and attendance will be recorded via GradesFirst.

**Changes:** This outline is a guideline and not a contract. As such, I may alter it if it seems to be in the best interest of the class to do so. I will discuss prominent changes with you and post them on Blackboard. I will make every attempt to hold graded activities on the date scheduled

**Attendance:** Class attendance is mandatory, students are expected to attend and participate in all scheduled meetings. Students are also expected to show active participation in the course and complete each learning module assignments on-time via Blackboard and show active participation. Students are allowed up to 3 excused absences throughout the semester. There are only two types of excused absences as the following:

- **Planned Absences.** Students must notify instructors in writing at least two weeks prior to planned absences such as participation in an official university function, observance of a religious holy day or active military service. If the absence is for military service the student should provide to each instructor a copy of the military orders. The University of the Incarnate Word welcomes persons of diverse backgrounds and is therefore committed to providing reasonable accommodations for students wanting to attend religious observances and who will miss class. Students must inform instructors at least two weeks prior to attending a religious observance. Students use the form found in the UIW Student Handbook Student Code of Conduct to request accommodations from the instructor.
- **Illness or other extenuating circumstances.** Students should notify the instructor directly of absence due to illness or other extenuating circumstance.

Students who are not able to attend a course are responsible for dropping the course by the appropriate deadline. Instructors may not automatically drop a student from a course. Students who do not attend, accumulate 4 or more absences, and who do not officially drop the course will be reported to the dean of student success and will receive a failing grade for the course.

**Makeup Policy:** Homework assignments only may be reassessed up to 1 week late with a fixed, post-evaluation penalty of 25%. No make-up work will be accepted more than 7 calendar days past the due date. There will be no accommodations for missed group project submissions or exams and students will receive a zero for that grade.

**Academic Integrity Statement:** The highest standards of academic honesty are expected in the course. Forms of academic dishonesty include, but are not limited to cheating, plagiarism, counterfeit work, falsification of academic record, unauthorized reuse of work, theft, and collusion. See the student handbook for definitions and procedures for investigation of claims of academic dishonesty. <http://www.uiw.edu/campuslife/documents/uiwstudenthandbook1618.pdf>

**Disability Accommodations:** The University of the Incarnate Word is committed to providing a supportive, challenging, diverse and integrated environment for all students. In accordance with Section 504 of the Rehabilitation Act â Subpart E, Title III of the Americans with Disabilities Act (ADA), and Title III of the ADA Amendments Act of 2008 (ADAAA), the University ensures accessibility to its programs, services and activities for qualified students with documented disabilities. To qualify for services, the student must provide Student Disability Services with the appropriate documentation of his or her disability at the time services and/or accommodations are requested.

**Title IX Information:** Unlawful discrimination has no place at the University of the Incarnate Word. It violates the University's core values, including its commitment to equal opportunity and inclusion, and will not be tolerated. The University of the Incarnate Word prohibits sexual misconduct, that can include:

(1) sex and gender based discrimination; (2) sexual and sex and gender based harassment (including a hostile environment based on sex or gender); (3) sexual assault; (4) sexual exploitation; (5) stalking; and (6) relationship violence (including dating and domestic violence). For more information, or to report an incident, please visit [www.uiw.edu/titleix](http://www.uiw.edu/titleix).

**Pregnancy Accommodations:** Under the Department of Education's (DOE) regulations implementing Title IX of the Education Amendments of 1972, the University does not discriminate against any student on the basis of pregnancy or pregnancy related conditions. To request reasonable accommodations for disability, temporary disability (e.g., injury, surgery) or pregnancy, please contact:

Student Disability Services  
4301 Broadway CPO 286  
Administration Building â Suite 105  
San Antonio, TX 78209  
(210) 829-3997 (210) 829-6078

**Academic Grade Assignments:** According to the Undergraduate Catalog the following is how letter grades will be assigned at the University.

Grade	Numeric Range	Grade Points	Comments
A	93 - 100	4.00	Indicates a superior grasp of the subject matter of the course. Demonstrates initiative and originality in approaching problems. Appropriately synthesizes course information with ability to relate knowledge to new situations.
A-	90 - 92	3.70	
B+	87 - 89	3.30	
B	83 - 86	3.00	Indicates better than average grasp of the subject matter of the course and ability to appropriately apply principles with intelligence.
B-	80 - 82	2.70	
C+	77 - 79	2.30	
C	70-76	2.00	Indicates an acceptable grasp of the essential knowledge elements of the course.
D+	67 - 69	1.30	
D	63 - 66	1.00	
D-	60 - 62	0.07	Indicates less than average performance in the course.
F	<60	0.00	
			Indicates failure to master the minimum essentials of the course material. The course must be repeated.

## 9 Course Schedule

Wk	Date	Topic	Comments
1	08/24	Course Overview/Syllabus	
	08/26	Overview of Machine Learning with MATLAB (Live Scripts)	
2	08/31	Overview of Machine Learning with MATLAB (Live Scripts) Cont.	
	09/02	Using with Data in MATLAB (Structure Arrays, Cell Arrays, and Tables)	
3	09/07	No Class	Labor Day
	09/09	Using with Data in MATLAB (Structure Arrays, Cell Arrays, and Tables) Cont.	HW 1 Due
6	09/14	Finding Natural Patterns in Data	
	09/16	Finding Natural Patterns in Data Cont.	
7	09/21	Classification Models in MATLAB	
	09/23	Classification Models in MATLAB Cont.	
8	09/28	Midterm I Review	
	09/30	Midterm I	
9	10/05	Supervised Learning Techniques (Nearest Neighbor, Classification Trees, DA, SVM)	HW 2 Due
	10/07	Supervised Learning Techniques (Nearest Neighbor, Classification Trees, DA, SVM) Cont.	
10	10/12	Supervised Learning Techniques (Nearest Neighbor, Classification Trees, DA, SVM)s	Group Project Status Report Due
	10/14	Unsupervised Learning Techniques (k-Means, GMMs, Hierarchical)	
11	10/19	Unsupervised Learning Techniques (k-Means, GMMs, Hierarchical) Cont.	
	10/21	Unsupervised Learning Techniques (k-Means, GMMs, Hierarchical) Cont.	
12	10/26	Predictive Models in MATLAB and performance improvement	
	10/28	Predictive Models in MATLAB and performance improvement Cont.	
13	11/2	Midterm II Review	
	11/4	Midterm II	
14	11/9	Regression Models using Supervised Learning	HW 3 Due
	11/11	Regression Models using Supervised Learning Cont.	
15	11/16	Introduction to Neural Networks in MATLAB	
	11/18	Introduction to Neural Networks in MATLAB Cont.	
16	11/23	Group Presentations	Group Project Presentation Due
	11/25	No Class	Thanks Giving
17	11/30	Group Project Discussions	
	12/02	Course Review	
18	12/06 - 12/10	Final Exams	
	12/10	Last Day of Class	
	12/11	Commencement	
19	12/14	Final Grades Due	