

CPRE 431

M01 Homework

Assignments will be submitted in PDF format via Canvas.

Please submit your homework online through Canvas. Late homework will not be accepted.

Important: Your submission must be in .pdf format ONLY!

1. What is the difference between a threat, vulnerability, and risk?
2. Consider an automated teller machine (ATM) in which users provide a personal identification number (PIN) and a card for account access.
 - a. Give examples of confidentiality, integrity, and availability requirements for the system (ATM, Card, Pin) and, in each case, indicate the degree of importance (High, Medium, Low) of the requirement.
 - b. For the following scenarios, please indicate which security property (confidentiality, integrity, and availability, non-repudiation) is affected, and suggest how can we fix this:
 - i. The ATM reads the Card data and Pin, then sends them as clear text on the network.
 - ii. The ATM allows user to increase/decrease his account monetary values (without actually adding/deducting money to/from his account), and user can claim that he/she was not responsible for this.
 - iii. The network connection between the ATM and the bank was down, and still the ATM allowed the users to perform their transactions.
3. Consider the following general code for allowing access to a resource:

```
DWORD dwRet = IsAccessAllowed(...);
if (dwRet == ERROR) {
    // Security check failed.
    // Inform user that access is denied.
} else {
    // Security check OK.
}
```

 - a. Explain the security flaw in this program.
 - b. Rewrite the code to avoid the flaw (Hint: Consider the design principle of fail-safe defaults.)