Secure Software Development Diploma in CSF Year 2 (2021/2022) Semester 3	Week **8-15**
SSD Assignment (40%)	
Last Updated: 26/05/2021	

LEARNING OBJECTIVES

Learning objectives are to:

- Assess students' understanding on secure software development lifecycle (SSDLC).
- Assess students' ability to design and develop a secure software.
- Assess students' effectiveness working as a team.

SCENARIO

Together with a group of friends, you had setup a company specializing in developing secure software. Armed with knowledge of Secure Software Development, a course taken in Ngee Ann Polytechnic, you engaged in developing a secure web application for an organization. You will execute phases of the secure software development lifecycle to deliver a reliable, resilient and secure web application. The organization will eventually deploy the secure web application in an architecture that you recommend.

ASSIGNMENT SCOPE

1) Students will be required to form teams (minimum of 3 to a maximum of 4 students) and develop a secure web application. The deliverables include:

- A Project Report - 15%
- A working secure website – 15%
- Assignment Demo & Presentation - 10%

(Note: the web application selected must not be similar to the other groups. Upload a brief description of your web application (Product Vision Board) into MS Teams: SSD-AY2021-xxx-Pxx-Assignment).

2) Each student in the team must develop at least one distinct major feature of the web application. The major features include, but not limited to, the followings:-

a) Login/Registration/Authentication (as a single feature - mandatory)
b) Authorization (eg; Admin features versus User features - mandatory)
c) CRUD Database (mandatory)
d) Audit/Accountability (eg; Logging/Monitoring)
e) Miscellaneous Pages - Shopping Cart/Search/Rating/Feedback

A typical 3 members team will, therefore, do the following features:-

Student A	Login/Registration/Authentication
Student B	Authorization (incl. Admin features)
Student C	CRUD Database + Audit/Accountability or Miscellaneous Pages

Whoever does CRUD Database have to complete the database structure for the assignment **EARLY**. It is advised that CRUD Database to be completed in Week 11. Therefore, please use week 9 -10 to not only decide on the product/service to be developed BUT also on the underlying CRUD database to be used.

3) Document the Secure Software Requirements, Design, Coding, and Testing for the feature developed. **Therefore, each student would have a document of software requirement, design, coding and testing for the feature undertaken.**

4) Compiled all the documents produced to form the final assignment report. Report must follow the structure as spelt out in the Assignment Report Requirements & Expectations section.

ASSIGNMENT DELIVERABLES & TIMELINE

- **Assignment Outline (Product Vision Board)** – week 11
  - Project Title
  - Project Vision
  - Project Description
  - Project Features (with brief description)
  - List members and the features they would work on

  Note: Assignment outline will be part of the Final Report (see below).
- **Final Report**
- **Secure Web Application Solution (Zip file)**

  [Due date of final report and secure web application solution: **1 August 2021 (Sunday) @ 2359 hrs** (Teams submission) (Week 15)]
- **Presentation and Demo** – Week 16 and 17

ASSIGNMENT REPORT REQUIREMENTS & EXPECTATIONS

Team Report Requirements:

Submit a 75-100 page report (excluding appendices) using Arial size font 12 with 1.5 spacing that would include the followings:

1. Project Title
2. Project Vision
3. Project Description
4. Project Features (with brief description)
5. List members and the features they worked on
6. 3-Tier Application Architecture
7. Feature 1 (e.g., Login/Registration/Authentication):
    - 1.1 Secure Software Requirements
        1. Use Case and Misuse Case Modeling
        2. Data Labelling & Classification
        3. Subject/Object Matrix
        4. …… (Refer to Week 3 & 4)
    - 2.1 Secure Software Design
        1. Feature related security design (Refer to Week 5 & 6)
        2. Attack Surface Evaluation (Refer to Week 7)
        3. Threat Modeling (Refer to Week 7)
    - 3.1 Secure Software Coding (Refer to Week 11 & 12)
        1. Feature related Defensive Coding Practices
        2. Secure Software Processes
            1. Versioning
            2. Code analysis
            3. Code/Peer review
    - 4.1 Secure Software Testing (Refer to Week 13 & 15)
        1. Test Strategy
        2. Test Plan
        3. Test Cases
    - 5.1 Security Conclusion of the Feature
8. Feature 2 (eg; Authorization) (Repeat similar structure as in (7) above)
    - 1.1 Secure Software Requirements
    - 2.1 Secure Software Design
    - 3.1 Secure Software Coding
    - 4.1 Secure Software Testing
    - 5.1 Security Conclusion of the Feature
9. Feature 3 (Repeat similar structure as in (7) above)
10. Feature 4 ((Repeat similar structure as in (7) above, if any)
11. Conclusion
12. References
13. Appendix
    - 1.1 Checklist of Secure Software Feature Attempted

2.1 ……..
3.1 ……..

Report Organization and Report Writing

- Proper Introduction to your report;
- Report Body must show good linkages and transition from one section to the next;
- Good conclusion to your report;
- Language used must be fluent; report contents must be coherent;
- Needs to cite your sources and references

GENERAL ASSESSMENT CRITERIA

Team Report will be assessed based on the following criteria:-

- Neatness and professionalism of report submitted
- Evidence of work put into the project
- Relevance and clear explanation on developing a secure web application/software (eg; secure design, development, testing, etc).
- Relevance and clear explanation on the 3-Tier architecture adopted for the web application/software.

Presentation and demo will be assessed based on the following criteria:-

- Presentation will be assessed individually (as well as a team).
- Ability to present confidently and articulate concepts and understanding in a clear and concise manner
- Clear and concise demonstration of the secure features of the web application.
- Submission of the secure web application/software.

[Note: Students are encouraged to conduct thorough checks on their software such that there are no security breaches.]

Team Report Submission Format

i) Front Page: Report Cover
ii) Team Report Contents
iii) Team members' contributions (checklist)
iv) Power point Slides (optional)
v) Secure web application solution (Zip)

PROPOSED WORKPLAN FOR ASSIGNMENT

Deliverables	Week(s)	Submission
Assignment Outline (Product Vision Board)	Week 8 - 11 (Due: Week 11)	Upload in MS Teams
Implementation of Secure Web Application & Final Report	Week 8 - 15 (Due: Week 15)	Upload in MS Teams
Team Presentation/Demo of Secure Web Application	Week 16-17	TBA

FAQ

1. Can I do the assignment with a team of 5 or more?

The assignment is a team-based assignment. The scope of work is designed for a group of 3-4 students. Therefore, please keep to the size constraint. Students can join another team to keep to the group size limit. Tutor will assign students to another team if need to.

2. Can I do the assignment solo?

The assignment is a team-based assignment. Please form a group of 3-4 students to work on the assignment.

3. Can I have a team of 2? And will my team be getting better grade because our team has a member lesser?

The assignment is a team-based assignment scoped for a group of 3-4 students in a team. Please form a group of 3-4 students to work on the assignment.

4. Initially, my team consists of 3 members. But a member was not contributing (for whatever reasons) and it's like a 2 members team. Will my team be getting better grade because of a member lesser?

Assignment is graded based on efforts put into the assignment using the marking rubric provided. For issue on non-contributing member, please approach and inform your tutor early.

5. My team does not want to use Razor Pages for the assignment. Can we develop the the assignment using other programming languages and/or framework?

Yes, you can work on the assignment using other programming languages and/or framework. The assignment's objectives of developing a secure web application must be met regardless of the programming languages and/or framework used. Report, secure web application and presentation as deliverables for the assignment, must be duly completed as spelt out in the assignment using the chosen programming languages and/or framework.

6. Can I get extension on the deadline for the assignment?

Any extension on deadline will have indirect downstream impact on other modules' assignment submissions as well as learnings. It also brings to question the objectivity of grading, if an extension is given to a team but not others. Apart from that, ample time had been given to duly complete the assignment stretching before term break. As such, extension on deadline will not be approved.

Teams are expected to complete the assignment within the timeframe allocated. Teams can still submit after deadline, however, penalty will be imposed for late submission.

7. Is 75-100 pages limit on per student or the whole report itself?

The 75-100 pages limit is on the whole report itself.

8. Can I submit beyond 100 pages for the assignment report?

No, you should submit a report capped at 100 pages max regardless of the size of the team.

9. Can I submit the final report after presentation demo?

All deliverables for the assignment must be submitted in one submission. Deliverables submitted in piece meal manner will not be tolerated. All assignment deliverables have to be submitted before presentation demo.