COS420 – Introduction to Software Engineering – Project Details – Spring 2020

<u>Project Details:</u>

Scrum Roles:
- Scrum roles should be shared among team members, so everyone gets to play the *Scrum Master* and *Product Owner* at least once.
  - At the end of the semester, the instructor will check if everyone has participated in the role of scrum master and/or product owner.
  - The students who have not played any of the two roles will lose 20% (10% for each role) of their total project's grade. That is, if their total group's grade is 90/100, their grade will be 70/100.
- Product Owner
  - Manages the product backlog.
  - Orders the items in the product backlog.
  - Makes the product backlog visible to all.
  - Determines what is "done" and is acceptable in the sprint.
  - Creates the required documents.
  - May cancel a sprint if the sprint goal becomes obsolete.
- Scrum Master
  - Makes sure the development team is practicing in Scrum properly.
  - Facilitates the product owner's and development team's work.
  - Creates the required documents.
  - Interfaces with external entities.
- Development Team
  - Determine the work needs to be done in a sprint.
  - Work with the product owner to determine what "done" is.
  - Create the required documents.
  - Implement the user stories in the sprint.
  - Manage the sprint backlog.

Sprints:
- 2 – Week iteration implementing a set of prioritized user stories.
- Release of software should be made every 1 to 2 sprints and marked in GitHub.

Sprint Planning:
- Sprint goal is given by the Product Owner.
- It also should include:
  - What can be done in each sprint and how the chosen work gets done.

Daily Scrum:
- 15 – minute meeting of the development team that may be attended by the Scrum Master and others if they do not interfere with the development team.
- Kanban board must be used for team members to show progress.
- Each team member should report:
  - What they have done, what they will do, and what impediments prevent them from progressing.
- <u>Note that</u> for the class project and due to the limited time, it is expected that each group perform around 1 – 2 daily scrums per week.

Sprint Review Process:
- Product Owner marks what items are "done" and "not done" on sprint backlog file.
- Development team discusses what went well, what problems occurred, and how the problems were solved.
- Development team demonstrates the work "done" (software and documents), shows examples of the corresponding code, and answers questions.
- Product Owner discusses the product backlog and any changes due to time, budget, or market issues.
- Product Owner, Development Team, and Scrum Master talk about what to do next from their perspectives.
- Another development team downloads, compiles, executes, and reviews the product and other project artifacts.
- Details of the sprint review document is given below.
- Note that sometimes sprint tasks for a user story might be about learning new development technique. Those items should also be included in the sprint backlog and sprint review process.

Scrum Artifacts:
- Provide a link to a document repository and a link to a configuration management and issue tracking repository where the product and artifacts will be kept and updated so that a record of team member work on the artifacts is visible.
  - *For example:* GitHub should show a record of changes to files and documents with the user who changed them.
  - Team members need to submit their own work so that it is easy to see the documents they updated and the product updates they made.
  - **The instructor periodically checks the GitHub repository and tracks each student's participation/contribution. Note that GitHub shows the contributors, the distribution and the percentage of the contributions. Each student will also be marked individually based on their contribution on the GitHub. If the instructor decides that a student's participation in any of the deliverables is not satisfactory, the student will lose mark.**
- Provide a link to a Kanban board where team progress may be shown on any day of the sprint

Documents:

Note: Names of each document should match the predefined format (defined under each document). If the file name does not match the format, the team will lose 50% of the total mark of the deliverable.

- Project Description Document in Word or PDF format. It includes:
  - Group name and team members.
  - App name and App category.
  - General overview and application's description.
  - General Overview of Similar apps – The app should be compared with minimum 3 other similar applications. Each app's comparison should be at least 1 paragraph long – Minimum 3 paragraphs for all three.
  - The file name should be as follows: **GroupName_Deliverable_i_ProjectDescription** *(i = 1..4).*

- User Story Document in Word or PDF format. User stories are in the following format:
  - Formatted as "As a <user role>, I need to <feature needed> because of <benefit>.

- As a general guide, stories should implement a complete piece of needed functionality for the user that is larger than a user interface widget, but not so large as to be several user interface's screens with backplane.
- A user story that is an epic should be designated as such and expanded into multiple user stories before the sprint where the user story is going to be implemented.
- The file name should be as follows: **GroupName_Deliverable_i_UserStory** *(i = 1..4).*

- Product Backlog Excel File with one user story per row – Must be created before sprint 1 and updated at a minimum at the beginning and end of each sprint. It includes:
  - ID: unique for each story
  - Story: Contains the user stories (one story per row) in priority order
    - Formatted as "As a <user role>, I need to <feature needed> because of <benefit>.
  - Sprint: The story's sprint number (when it gets implemented)
  - Story Priority: H (high), M (medium), L (low)
  - Story Status: W (waiting), IP (in progress), T (testing), D (done)
  - Story Points: Number of story points gives an indication of the difficulty of the story's development and testing as well as possibly an estimate of the number of hours to design, implement, and test the story.
  - The file name should be as follows: **GroupName_Deliverable_i_ProductBacklog_j** *(i = 1..4 & j = 1..6).*

- Sprint Backlog Excel File with each sprint on a separate sheet, one user story per row – Must be created before sprint 1 and updated at a minimum of once a day during the sprint. It includes:
  - Sprint Goal and Number.
  - Story copied from the project backlog or a sprint task story.
  - Story Type: F (functional), NF (non-functional) with a subtype: B (bug), T (technical work), KA (knowledge acquisition).
  - Story Points.
  - Story Points Completed.
  - Team Member Names and percentage of contribution to the story.
  - The file name should be as follows: **GroupName_Deliverable_i_SprintBacklog_j** *(i = 1..4 & j = 1..6).*

- Team Member Report Document in Word of PDF format – With 1 – 2 pages per team member for every sprint – Must be created during sprint 1 and updated for every sprint. It includes:
  - Team member name.
  - Roles played this week.
  - Role duties and work performed this week, artifacts created/updated/reviewed.
  - Role duties and work to be performed next week.
  - Issues encountered.
  - Issued resolved.
  - Percentage of contributions of each team member in the deliverable. Note that the percentage should add up to 100%. The percentage will be checked against GitHub as well.
  - Up to one page: Weaknesses and Strengths of the student from peers' point of view. Reports on the improvements in compare to the previous sprint and the plan for the next sprint's improvement.

- o The file name should be as follows: **GroupName_Deliverable_i_TeamMemberReport_j (*i = 1..4 and j = 1..6*).**

- Sprint Review Document in Word or PDF format – One document with each sprint given its own heading with the following information – Must be created after sprint 1 and updated after each sprint. It includes:
  - o Sprint Number.
  - o Features implemented.
  - o Issues fixed.
  - o What went well in the implementation, what problems occurred, how problems were solved.
  - o Changes made.
  - o What will be done for the next sprint.
  - o What went well in Scrum, what could be improved, and what changes will be made.
  - o The file name should be as follows: **GroupName_Deliverable_i_SprintReview_j (*i = 1..4 and j = 1..6*).**

- Peer-Review Report Document in Word or PDF format – **This is the only document that must be submitted individually and should be kept confidential.**
  - o One document for each deliverable given its own heading – Must be created for deliverable 1 and updated for each deliverable afterwards. The templates and the questions will be given in a document and the students should follow the template and its structure.
  - o The grades given in each peer-review document will also be considered when giving individual grades for the project.
  - o The file name should be as follows: **StudentName_Deliverable_i_PeerReviewReport (*i = 1..4*).**
  - o The result of the peer-review evaluation has direct impact on the grades of the deliverable.

- Software Requirements Specification Document in Word or PDF format – Must be created during sprint 1 (deliverable 1) and updated as needed. It should follow IEEE SRS guideline and it includes:
  - o Functional and Non-functional requirements.
  - o System and user requirements.
  - o Expanded user stories as use cases.
  - o User interface mockup.
  - o The file name should be as follows: **GroupName_Deliverable_i_SRS (*i = 1..4*).**

- Use Case Model Document in Word or PDF format – Must be created during sprint 1 (deliverable 1) and updated as needed. It includes:
  - o Use case models.
  - o For each use case model, use case descriptions include:
    - ▪ use case descriptions with a unique numbered id
    - ▪ the use case name
    - ▪ relevant user story ids that pertain to the use case
    - ▪ actors
    - ▪ preconditions
    - ▪ user/system steps
    - ▪ post-conditions
    - ▪ exceptions handled

- The file name should be as follows: **GroupName_Deliverable_i_UseCaseModel** *(i = 1..4).*

- Sequence Diagram Document in Word or PDF format – Must be created during sprint 2 (deliverable 2) and updated as needed.
    - Analysis Sequence Diagrams.
    - Design Sequence Diagrams.
    - Correct variables, methods and parameters.
    - For each diagram you need to write a description of the steps.
    - The file name is as follows: **GroupName_Deliverable_i_SequenceDiagram** *(i = 2..4).*

- Domain Model in Word or PDF format – Must be created during sprint 2 (deliverable 2) and updated as needed. It includes:
    - UML class diagrams for domain and also for detailed design with their attributes, associations, and methods that would be representative of the system under development and the user stories.
    - The file name should be as follows: **GroupName_Deliverable_i_DomainModel** *(i = 2..4).*

- Software Architecture Document in Word or PDF format – Must be created during sprint 2 (deliverable 2) and updated as needed. It includes:
    - A UML package diagram showing the system architecture, where classes/system entities are located, and associations.
    - The description of the architecture and the justification of the chosen architecture.
    - The file name is as follows: **GroupName_Deliverable_i_SoftwareArchitecture** (*i = 2..4*).

- Detailed Design Model and Design Pattern Document in Word or PDF format – Must be created during sprint 4 (deliverable 3) and updated as needed. It includes:
    - UML class diagrams for detailed design with their attributes, associations, and methods that would be representative of the system under development and the user stories.
    - UML class diagrams for design patterns with their detailed descriptions, attributes, methods, associations, etc.
    - The file name should be as follows: **GroupName_Deliverable_i_DesignPattern** *(i = 3..4).*

- Configuration Management Plan Document in Word or PDF format – Must be created during sprint 4 (deliverable 3) and updated as needed. It includes:
    - Software configuration management plan which follows IEEE 828-2005 standard and needs to have the following sections:
        - Introduction – Describes the plan's purpose, scope of application, key terms, and references.
        - SCM Management (Who?) – Identifies the responsibilities and authorities for managing and accomplishing the planned SCM activities.
        - SCM Activities (What?) – Identifies all activities to be performed in applying to the project.
        - SCM Schedule (When?) – Establishes required coordination of SCM activities with other activities in the project.
        - SCM Resources (How?) – Identifies tools and physical and human resources required for the execution of the plan.
        - SCM Plan Maintenance – Identifies how the Plan will be kept current while in effect.
    - The file name is as follows: **GroupName_Deliverable_i_ConfigManagement** *(i = 3..4).*

- Test Plan Document in Word or PDF format – Must be created during sprint 5 (deliverable 3) and updated as needed. It includes:
  - Test cases for all the three types of testing: unit testing, use case testing and acceptance testing.
  - Screenshots of the results for all the three types of testing: unit testing, use case testing, acceptance testing.
  - The file name should be as follows: **GroupName_Deliverable_i_TestPlan** *(i = 3..4).*

- Plan for Future Document in Word or PDF format – Must be created during sprint 6 (deliverable 4). It includes:
  - The list of the requirements or user stories that have not been addressed during the semester.
  - The plan for future development of the remaining tasks.
  - The file name should be as follows: **GroupName_Deliverable_i_FuturePlan** *(i = 4).*

- Focus group:
  - A focus group will be done after sprint one.
  - The focus group should be run with 4 – 6 people (clients) who are not part of the class and who represent potential users of the product.
  - The participants should be walked through the permission form and allowed to sign their name and put the date if they agree to be a participant.
  - One team member should present the concepts of the product and show a product demo or mockup.
  - One team member should be a moderator to initiate discussions about the product.
  - One team member should record and take notes of suggestions offered by the focus group's participants.
  - The focus group session may be recorded if all participants give permission.
  - Focus Group Document includes:
    - Artifacts
    - Permission forms
    - Scripts
    - Results
    - Potential videos
  - The file name should be as follows: **GroupName_Deliverable_i_FocusGroup** *(i = 2).*

- Usability Study:
  - A usability study should be performed in sprint 6.
  - The usability study should be conducted with 4 – 6 people (clients) who are not part of the class and who represent potential users of the product (preferably the same group as the focus group).
  - Each participant should be walked through the permission form and allowed to sign their name and put the date if they agree to be a participant.
  - A script should be used to have the participant give thoughts about the product and to complete tasks on the level of user stories.
  - The script should not change from participant to participant.
  - The participants may use a phone provided by the team or the participant's own phone if the app can be installed and used without harm to the participant or his/her phone.
  - Ideally, the participant should not have to be helped in completing a task. Simply note if the participant could finish or not finish and how far they could get.
  - The usability session may be recorded with the participants' permission.

- One team member should take a participant through the usability study.
- At least one team member should record and take notes of suggestions offered.
- <u>Usability Study Document</u> includes:
  - Artifacts
  - Permission forms
  - Scripts
  - Results
  - Potential videos
- The file name should be as follows: **GroupName_Deliverable_i_UsabilityStudy** *(i = 4).*