**T.A. Marryshow Community College**

**School of Applied Arts and Technology**

**Department of Computer and Electronics Technology**

**Course Title: Capstone Project**

**Course Number:** PMT226

**Credit Value:** 4

**Course Duration:** 75 hours

**Prerequisite(s): Completion of all year 1 courses**

**Course Description:**

This course allows the student to complete a Final Year Project that incorporates material learned throughout the program while meeting required industry standards. Students are introduced to the methodologies of research and application/product development through a series of lectures and are guided through a step-by-step practice to complete the initial stages of proposal, planning and design of a project. Students must also meet regularly with supervisor(s) who will monitor their continuous progress.

On completion of this course, students will build a model or a prototype device (hardware project), develop a software application or conduct a research in a specific field as it relates to technology.

**GENERAL OBJECTIVES**

Upon successful completion of this course, students will be able to:

1. Design, plan and propose a project according to user requirements.
2. Apply project development methodologies appropriate to the project
3. Prepare and use various information gathering techniques to obtain user information requirements and system specifications.
4. Design solutions to problems utilizing a systems approach.
5. Determine the cultural, social, international, political and physical environment of the project.
6. Analyze different solutions and estimate their cost, with the aim of choosing the right one.
7. Discuss techniques for planning and sequencing project activities, resources.
8. Document the project from start to finish showing the key deliverables.
9. Demonstrate technical knowledge of their selected project topic.
10. Discuss key elements of communications and reporting to stakeholders.

**SPECIFIC OBJECTIVES**

**Knowledge Requirements:** Students will be able to:

1. Demonstrate safety procedures used in the trade.
2. Apply the concepts, methods, tools and techniques to solve a real business problem.
3. Analyze a business need for information and to develop an appropriate strategy to solve the problem and provide the required information service.
4. Prepare and use various information gathering techniques to obtain user information requirements and system expectations.
5. Estimate costs and prepare budget
6. Conduct procurement, taking into account, lead time.
7. Establish price list and availability of materials.
8. Manage project cost, time and scope.
9. State the measures used in the assembling, usage, and maintenance of model.
10. Collect materials needed for the assembling, designing and testing of the model.
11. Plan projects, including identifying milestones and criteria for meeting them.
12. Record the time spent in related activities and during work on the project.
13. Describe the parameters used in design considerations
14. Communicate effectively, in both written and oral forms the systems specifications, design and recommendations.

**Performance Requirements:** Students will be able to perform the following where appropriate:

1. Follow safety procedures of the trade.
2. Use the vocabulary of the trade.
3. Document the project.
4. Procure all components necessary for the completion of the prototype.
5. Follow the established purchasing procedure for the purchasing of parts.
6. Use appropriate websites when purchasing components to ensure on time delivery.

**Attitudinal Requirements:** Students are expected to:

1. Observe safety precautions related to computers and apparatus being used.
2. Pay attention to details.
3. Observe safety regulations when working.
4. Make scheduled updates with Instructor in charge of the course.
5. Adhere to established steps and procedures while carrying out task.
6. Complete all activities in the time specified.
7. Be alert, responsive and decisive in completing the tasks.

**COURSE CONTENT:**

**Module 1: Introduction**

* What is a Project?
* The role of a project manager
* Project Constraints
* Understanding the Nature of Projects
* The Project Life Cycle
* Project Identification
* Creating a problem statement
* Creating a project report

**Module 2: Information Requirements & Analysis**

* Information Gathering: Interactive Methods
* Information Gathering: Unobtrusive Methods
* Using Data Flow Diagrams and related diagrams
* Using Project management software

**Module 3: Project Initiation Stage**

* Obtaining authorization to start project or phase
* Definition of initial scope
* Commitment of initial financial resources
* Project Stakeholder
* Project Risk
* Assumptions/Constraints
* Creation of Project Charter

**Module 4: The Project Planning Stage**

* Project Scope Management
* Project Time Management
* Project Cost Management
* Plan Quality Management
* Plan Communications Management
* Project Risk Management
* Plan Procurement Management
* Plan Stakeholder Management
* Develop Project Plan

**Module 5: Design**

* Designing Effective Input and Output
* Designing Databases
* Architecture Design
* Designing Accurate Data Entry Procedures

**Module 6: Project Execution Stage**

* Direct and manage project work
* Perform Quality Assurance
* Manage Communications
* Conduct Procurements
* Manage Stakeholders

**Module 7: Monitoring and Controlling Stage**

* Monitor and Control project work
* Validate and control project scope
* Control Schedule
* Control Costs
* Control Quality
* Control Communications
* Control Risks
* Control Procurements
* Control Stakeholder engagements

**Module 8: Project Closure**

* Obtain acceptance by customer or sponsor to formally close the project
* Conduct post-project review
* Document lessons learned
* Archive all relevant project documents to be used as Historical Data.
* Project Close-out
* Complete project report
* Presentation of Project

**METHODS OF INSTRUCTION:**

1. Guided demonstrations (One-on-One training)
2. Online videos (e-learning platform)
3. Discussions
4. Group activities
5. Lectures
6. Private Consultations

**ASSESSMENT & EVALUATION**

Project proposal and planning documentation (15%)

Prototype project review (10%)

Final project (software, documentation, and presentation) (40%)

Individual reflective report (15%)

Quizzes/ Lessons (10%)

Group Assignments 10%

**REQUIRED TEXT**

1. Project Management Institute. A Guide to the Project Management Body of Knowledge (PMBOK ® Guide) – Fifth Edition.
2. Project Management For Dummies by Stanley E. Portny
3. Systems Analysis and Design 10th Edition, Kenneth E. Kendall, & Julie E. Kendall, ©2019 Pearson
4. Systems Analysis and Design 12th Edition , by Scott Tilley, © 2020 Cengage.
5. Successful Project Management, 6th Edition by Jim Gido © 2015 Cengage

**SUPPLEMENTARY TEXT AND OTHER MATERIALS**

*Access to a variety of IT journals and databases.*

*Software development tools and platforms as required by the project.*

*Guidelines on academic and professional IT standards.*

**REQUIRED HARDWARE**

1. Laptop computer

**REQUIRED SOFTWARE**

1. Microsoft Project 2013 or Open source equivalent
2. Microsoft Word or equivalent
3. Programs necessary for software projects

**ATTENDANCE**

### According to the T. A. Marryshow Student Handbook a **minimum attendance of 85% is required for Graduation.**

**You will need the following software installed /available on your PC or laptop.**

1. Draw.io for creating flowcharts etc
2. Microsoft office or equivalent

***CLASSROOM POLICIES***

1. Cell phone ringers must be off, and phones may NOT be used during class, no matter how briefly. If your phone is out during class, you will be asked to leave, and it will count as an unexcused absence.
2. No food or drinks are allowed in the classroom.
3. No reading of magazines, newspapers, or other unrelated texts during class.
4. Laptops and tablets may be used for note-taking during lectures, but not for activities unrelated to the course. Students observed using devices for unrelated activities will lose the privilege of using devices in class.

***ABSENCES***

To succeed in the course, students must attend and participate in each class session. If you miss a session, it is your responsibility to learn any material missed.

Students are required to have at 85% attendance in this course. You can follow this course online as all materials are provided on Moodle. Excused absences are excluded from this policy; excused absences must be arranged in advance and are at instructor discretion.

***ACADEMIC INTEGRITY / CHEATING***

Any form of cheating on an assignment, homework, lab, or test will result in both a zero score for the assignment and a one-letter grade penalty in the course.

*Plagiarism* is the use of someone else’s words, ideas, or data without giving credit to the original author. Plagiarism is a form of cheating.

If you are confused as to the difference between helping each other (which is encouraged) and cheating (which will not be tolerated), ask your instructor.

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| **Acceptable** | **Cheating** |
| Including a brief quote from a web page with the source cited. | Copying entire pages or paragraphs and republishing it as your own. |
| Using graphics from a free clip art  or graphic site. | Using someone else's graphics without permission or citation. |
| Discussing an assignment with another student. | Copying another student's work or file. |
| Looking at online sources or asking for a classmate’s help to figure out what to do. | Duplicating a classmate’s lab answers as your own, without performing the lab activity yourself. |

If you assist someone else in cheating, you can also be charged with cheating yourself. This can include giving another student access to your computer account, negligently permitting another student to access your account, or posting answer keys where others can access them. Protect your account as if your academic career depends on it!

***TIME PER TASK FOR COURSE***

For this course, estimate the following:

1. 30 to 60 minutes per week (reading)
2. 15 to 30 minutes per weekly review questions
3. 60 to 75 minutes per exercise
4. 60 minutes per project
5. 30 to 45 minutes per lecture

**WEEKLY COURSE OUTLINE: See Moodle for actual dates**

| Week | Focus Area | Objective | Activities & Learning Focus | Deliverables |
| --- | --- | --- | --- | --- |
| 1 | Course Introduction | Introduce course framework and expectations | Course overview, introduction to PMT and system analysis | - |
| 2 | Team Formation & Topic Selection | Form project teams and select topics | Team formation activities, topic brainstorming and selection | Team and topic selection |
| 3 | Project Proposal Writing | Develop a clear project proposal | Workshop on writing effective proposals, defining scope and objectives | Initial project proposal |
| 4 | Requirements Gathering | Gather detailed project requirements | Training on techniques for effective requirements gathering | Requirements specification document |
| 5 | System Analysis | Analyze system requirements | Introduction to analysis tools (e.g., UML diagrams) | System analysis report |
| 6 | Project Scope Definition | Define the scope of the project | Detailed scope definition session, stakeholder analysis | Project scope document |
| 7 | Project Scheduling | Plan the project timeline | Creating Gantt charts, setting milestones | Project schedule |
| 8 | Resource Allocation | Allocate resources for the project | Resource planning activities, budgeting | Resource allocation plan |
| 9 | Design Phase Initiation | Begin detailed system design | Design workshops, start system modeling | Initial design documents |
| 10 | Mid-Project Review | Evaluate progress and adjust plans | Presentation of current progress, feedback session | Mid-project evaluation report |
| 11 | Development Kickoff | Start development of the system | Coding practices, introduction to development environments | Development progress report |
| 12 | Development Continuation | Continue system development | Progress tracking, problem-solving sessions | Software build updates |
| 13 | Initial Testing | Conduct initial tests on the system | Introduction to testing methodologies, executing initial tests | Initial testing report |
|  | **Break** | | | |
| 14 | Advanced Testing & QA | Perform detailed testing and quality assurance | System testing, debugging, and refinement | Detailed QA report |
| 15 | System Refinement | Refine the system based on test outcomes | Refinement sprints, performance optimization | Refined project version |
| 16 | Final Project Development | Finalize development and prepare for presentation | Final coding and system checks, preparation for final presentation | Final project version ready for presentation |
| 17 | **Consultations** | | | |
| 18 | **Consultations** | | | |
| 19 | Presentation Preparation | Prepare for final project presentation | Creation of presentation materials, rehearsal | Presentation slides and rehearsal feedback |
| 20 | **Consultations** | | | |
| 21 | **Prototype Presentations** | | | |
| 22 - 23 | **Consultations** | | | |
| 24 | Final Presentation & Course Wrap-Up | Present final projects and conclude course | Final presentations to panel, course reflections, feedback sessions | Final presentation, course reflection document |
| 25 | Project Submission and Documentation | Complete project code, documentation, user manuals, and reflection reports | | |