Course 51 – Projects and Communications

**Description**

An introduction to project management is combined with applied communications documents (e.g. proposal, schedule, plan, and budget). Practical methods are applied to track effectiveness at meeting project performance goals (e.g. quality, time, budget, safety) and to manage changes in the use of available resources (e.g. people, equipment, time, $$$) to achieve desired performance goals.

**Rationale**

In addition to the technical components of a project (e.g. design, equipment, materials, construction, operations, and maintenance), non-technical components such as project management and associated communications, significantly contribute to a successful project outcome and team sustainability.

* Task 1: Identify project planning steps and documentation
* Task 2: Identify the tasks required for effective project development and management
* Task 3: Identify methods project managers and their teams use to effectively track and control projects (e.g. quality, time, budget, safety)
* Task 4: Identify available techniques and tools employed in industry (e.g. potential Belize RE project employers) to provide good project planning and management
* Task 5: Apply logic to sequence the individual tasks that define and constrain a successful project
* Task 6: Prepare and produce project planning documents (e.g. proposal, schedule, plan, and budget)
* Task 7: Employ standard estimating and scheduling procedures
* Task 8: Effectively communicate project status and goals to supervisors and to clients or customers

Apply project planning procedures into the course C 55 Project Plan documents (for C 63 Final Project)

Track effectiveness at meeting project performance goals (e.g. quality, time, budget, safety) and manage changes in the use of available resources (e.g. people, equipment, time, $$$) to achieve desired performance goals

Master Plan Learning Outcome 2 – **Investigation**  An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.

Master Plan Learning Outcome 6 – **Communication skills** An ability to communicate complex renewable energy concepts within the technical community, and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.

Master Plan Learning Outcome 8 – **Impact of Renewable Energy (RE) on society and the environment** An ability to analyze aspects of RE activities. This includes an understanding of the interactions that RE projects have with the economic, societal, health, safety, legal, and cultural aspects of society; the uncertainties in the prediction of such interactions; and sustainable design and development, and environmental stewardship.

Master Plan Learning Outcome 9 – **Ethics and equity** An ability to apply ethics, accountability, and equity.

Master Plan Learning Outcome 10 – **Economics and project management** An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of renewable energy, and to understand limitations.

**Proposed Breakdown of Focus (in lieu of “Marking” in Competency Based Course and Program)**

25% Individual Tests (Examples)

* 4% Task 1: Identify project planning steps and documentation
* 4% Task 2: Identify the tasks required for effective project development and management
* 12% Task 3: Identify methods project managers and their teams use to effectively track and control projects (e.g. quality, time, budget, safety)
* 5% Task 4: Identify available techniques and tools employed in industry (e.g. potential Belize RE project employers) to provide good project planning and management

35% Individual Projects (Examples)

* 3% Task 5: Apply logic to sequence the individual tasks that define and constrain a successful project
* 20% Task 6: Prepare and produce project planning documents (e.g. proposal, schedule, plan, and budget)
* 4% Task 7: Employ standard estimating and scheduling procedures
* 8% Task 8: Effectively communicate project status and goals to supervisors and to clients or customers

30% Group Projects (Examples)

* 4% Task 5: Apply logic to sequence the individual tasks that define and constrain a successful project
* 16% Task 6: Prepare and produce project planning documents (e.g. proposal, schedule, plan, and budget)
* 4% Task 7: Employ standard estimating and scheduling procedures
* 6% Task 8: Effectively communicate project status and goals to supervisors and to clients or customers

Task 01 (4% - Individual Test)

Identify Project Planning Steps and Documentation

* Plan – Go – Check – Act
* Initiation; Planning; Execution; Monitoring / controlling; and Closing
* Customers; Competitors; Capabilities; Cost; Channels; Communication; and Coordination

**(4%) Individual Test 01 - Task T 01**

4% from 4 questions

Instructor has introduced and reviewed in class, with discussions and examples, the “Five Steps” of Project Planning in general (e.g. Initiation; Planning; Execution; Monitoring / controlling; and Closing). Instructor has introduced and reviewed in class, with discussions and examples, the “Seven C’s” to be thinking about when planning a project (ie. Customers; Competitors; Capabilities; Cost; Channels; Communication; and Coordination). .

(1%) Q 01 – Describe the “Five Steps” of Project Planning as presented in class, with respect to an ITVET Belize Instructor and a Course

(1%) Q 02 – Describe the “Five Steps” of Project Planning as presented in class, with respect to a major family party (or equivalent) event.

(1%) Q 03 – Describe the “Seven C’s” (with 2 examples of each) with respect to the ITVET Belize school.

(1%) Q 04 – Describe the “Seven C’s” (with 2 examples of each) with respect to a sports team, or a radio station, or a business, or a musical band, or another organization.

Task 02 (4% - Individual Test)

Identify the tasks required for effective project development and management

* Project team – direction, management, motivation
* Project Plan – overall and at detailed stages
* Risk management – safety, business, technical
* Appropriate knowledge for realistic circumstances

**(4%) Individual Test 02 - Task T 02**

4% from 4 questions

Instructor provides course materials and leads relevant class discussions with examples.

(1%) Q 01 – For a school such as ITVET Belize, there are students, instructors, and staff. Imagine their roles, their goals, and their activities. Imagine you are the Director, responsible for the ITVET Belize school. For the effective operation of the school, and for each group of students, instructors, and staff, describe two examples of “direction” they would receive from your office; “management” used by your office to track progress in achieving their goals; and “motivation” provided through your office for each group to achieve their goals.

(1%) Q 02 – Describe an example of the overall detailed stages of a Project Plan for the following Scenario. Your team is responsible to paint the outside walls of a house, a nice new shade of ocean blue.

(1%) Q 03 – Risk management or hazard identification and reduction is part of project safety, business and technical planning and decision making. Imagine you own and operate a bus as a private business. Imagine you are contracted to drive a sports team from Belize City to a tournament in another community, and home again. In this scenario what might be a major risk or hazard to think about with respect to safety, to the operation of your business, and for the technical of getting the team to the tournament and home again. For each of the risks or hazards you have identified, identify 2 ways to reduce those risks or hazards.

(1%) Q 04 – Imagine a scenario where you are to organize a class trip to visit a renewable energy project in another community. Describe two examples of knowledge or information that a) must be known; b) might be good to know but is not perceived as really necessary; and c) not necessary.

Task 03 (12% - Individual Test)

Identify methods project managers and their teams use to effectively track and control projects

* Performance goals - quality, time, budget, & safety
	+ Physical, functional, service, financial, legal, social
* Tracking – performance; hours; $$$; incidents
* Variances from plan, schedule, budget

Instructor has presented course materials and led class discussions on Performance Goals, tracking performance, and measuring and responding to changes or variances in project activities.

**(12%) Individual Test 03 - Task T 03**

Imagine a Scenario where your team is to replace old solar panels on a building roof, with new ones. For the Scenario described, what might “success” look like for the following Performance Goals, where it is a measurable number?

(1%) Q 01 Performance Goals – What is a measureable goal with respect to Quality (e.g. function)

(1%) Q 02 Performance Goals – What is a measureable goal with respect to Time

(1%) Q 03 Performance Goals – What is a measureable goal with respect to Budget

(1%) Q 04 Performance Goals – What is a measureable goal with respect to Safety

For the indicated Scenario, what might be a method that a team, a project manager, or yourself might use to effectively track and control their project for what “success” looks like?

(1%) Q 05 Tracking – How to track and measure Performance Goals

(1%) Q 06 Tracking – How to track and measure Time (e.g. hours)

(1%) Q 07 Tracking – How to track and measure Financial resources (e.g. Dollars)

(1%) Q 08 Tracking – How to track and measure Incidents (e.g. safety near miss and lost time)

What might be a cause of each change listed below? How might each be measured and responded to?

(1%) Q 09 Variances – Cause, measure and response to a change in the Plan

(1%) Q 10 Variances – Cause, measure and response to a change in the Schedule

(1%) Q 11 Variances – Cause, measure and response to a change in the Budget

(1%) Q 12 Variances – Cause, measure and response to a change in the Contract Documents

Task 04 (5% - Individual Test)

Identify available techniques and tools employed in industry (e.g. potential Belize RE project employers) to provide good project planning and management

* Inspired by potential Belize based, RE projects
* Techniques that do not rely on digital tools
* Using digital tools that are expected to be available

**(5%) Individual Test 04 - Task T 04**

5% from 5 questions

The Instructor provides some examples and leads class discussions available tools and methods.

(1%) Q 01 – Inspired by a potential Belize based renewable energy or energy efficient project, create a Scenario of a similar but different “project” for your “team” to execute next month.

(1%) Q 02 – For your Scenario, describe a paper based tool or method for managing a project budget.

(1%) Q 03 – For your Scenario, describe a paper based tool or method for managing a project schedule.

(1%) Q 04 – For your Scenario, describe an available computer based tool for managing a project budget.

(1%) Q 05 – For your Scenario, describe an available computer based tool for managing a project schedule.

Task 05 (3% - Individual Assignment)

Apply logic to sequence the individual tasks that define and constrain a successful project

* Logic, logical ways, and logistics
* Exercises on an “best order” for scenario of tasks
* Proposing appropriate sequencing of tasks (e.g. technical project; safety; major family meal)

**(3%) Individual Assignment 01 - Task T 05**

Scheduling – be it using “Critical Path” or “bar chart” or other tools, methods or approaches - and adjusting it during a project, involves consideration of a sequence of tasks. In this assignment, student learner participants make a sequence of six to twelve tasks for three distinct “projects”(e.g. technical project; safety; and major family meal or event). Participants then rearrange the order of the tasks for a different participant to put back in the original order. The Instructor coordinates activities such that another participant seeks to put back in order a “best fit” of the mixed up tasks. Participants review proposed re-ordered sequence by other Participant and provide feedback / discuss.

(1%) Q 01 – Proposed sequencing of tasks – Technical Project Scenario (e.g. Trouble shooting a PV – Battery storage system that supports a remote location “lighthouse” by the ocean)

(1%) Q 02 – Proposed sequencing of tasks – Safety (e.g. Lock out tag out procedure when conducting maintenance and replacing the blades on a small wind turbine).

(1%) Q 03 – Proposed sequencing of tasks – major family meal (e.g. Grandmother’s 70th birthday for 24 people).

Task 06 (20% - Individual Assignment)

Prepare and produce project planning documents (e.g. proposal, schedule, plan, and budget)

* Components for Belize inspired project scenarios
* Individual and Group course projects
* Exercises that are technical and otherwise

After class discussions, Instructor presents and shares example(s) or at least layouts sufficient to describe or communicate typical content of a Project Plan, Schedule, Budget and Contract.

(As selected by the Instructor or Participant) Each Participant creates a different Scenario) A Scenario would include type of technical project (e.g. Small Wind, Solar Hot Water, Photovoltaic Panels, Energy Efficiency), and Site Assessment, Audit information, Working Assumptions (e.g. Location, Desired project energy performance goals, scope of project, limitations).

Also prepare a Scenario for a non-technical project (e.g. major family feast and party)

Each Participant prepares Project Documents based on their (Instructor approved) Scenario.

**(10%) Individual Assignment 02 - Task T 06**

Example of **technical** project planning documents (Proposal, schedule, plan, budget)

* (2%) Q 01 – Project Documents – Proposal (1 page that also references other documents)
* (2%) Q 02 – Project Documents – Schedule (Critical Path; Bar Chart – 2 – 4 pages)
* (2%) Q 03 – Project Documents – Budget (1 page)
* (2%) Q 04 – Project Documents – Plan (e.g. goals, success, equipment, team, task sequence, etc.)
* (2%) Q 05 – Project Documents - Contract (Offer, Acceptance, Consideration (e.g. $$), Obligations of Each, Competency / Capacity; Legality)

**(10%) Individual Assignment 03 - Task T 06**

Example of **non-technical** project planning documents (Proposal, schedule, plan, budget)

* (2%) Q 01 – Project Documents – Proposal (1 page that also references other documents)
* (2%) Q 02 – Project Documents – Schedule (Critical Path; Bar Chart – 2 – 4 pages)
* (2%) Q 03 – Project Documents – Budget (1 page)
* (2%) Q 04 – Project Documents – Plan (e.g. goals, success, equipment, team, task sequence, etc.)
* (2%) Q 05 – Project Documents - Contract (Offer, Acceptance, Consideration (e.g. $$), Obligations of Each, Competency / Capacity; Legality)

Task 07 (4% - Individual Assignment)

Employ standard estimating & scheduling procedures

* Inspired by potential Belize based, RE projects
* Scheduling (e.g. Critical Path and bar charts)
* Estimating (e.g. spreadsheet style) quantities and dollars, as planned and as regularly revised

Instructor presents templates(s) or example(s) of schedules (e.g. Critical Path and bar charts), and estimates (e.g. quantities for lists of materials, supplies, equipment, people, dollars).

(As selected by the Instructor or Participant) Each Participant creates a different Scenario) A Scenario would include type of project (e.g. Small Wind, Solar Hot Water, Photovoltaic Panels, Energy Efficiency), and Site Assessment, Audit information, Working Assumptions (e.g. Location, Desired project energy performance goals, scope of project, limitations).

(For Scenarios approved by the Instructor) Each Participant prepares original or Version 1.0 Scheduling and Estimating documents based on their Scenario.

Each Participant also makes revisions based on Instructor identified changes.

 **(4%) Individual Assignment 04 - Task T 07**

* (1%) Q 01 – Scheduling (Critical Path) and then with revisions
* (1%) Q 02 – Scheduling (Bar Chart) and then with revisions
* (1%) Q 03 – Estimating (Quantities) and then with revisions
* (1%) Q 04 - Estimating (Dollars) and then with revisions

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Task 08 (8% - Individual Assignment)

Effectively communicate project status and goals to supervisors and to clients or customers

* Project Documents – plan, schedule, budget
* Project Updates – documented, verbal, and digital
* Questions and Answers; Changes; Uncertainties

After class discussions, Instructor presents and shares example(s) or at least layouts sufficient to describe or communicate typical content of an Update to a project document.

(As selected by the Instructor or Participant) Each Participant uses or creates a different Scenario) A Scenario would include type of project (e.g. Small Wind, Solar Hot Water, Photovoltaic Panels, Energy Efficiency), and Site Assessment, Audit information, Working Assumptions (e.g. Location, Desired project energy performance goals, scope of project, limitations).

(For Scenarios selected by the Instructor) Each Participant prepares Updates based on Scenario.

Resulting Documents are reviewed and discussed with Instructor. Were expectations met? Surprises? Improvements to Scenario description? Improvements to documents?

 **(8%) Individual Assignment 05 - Task T 08**

Communicate to Instructor / “Customer” (or regulator, supplier, contractor, or other designated person)

* (2%) Q 01 – Communicating Updates – (To an technical audience) proposed changes to Scenario Schedule, Budget, Equipment, and compelling reasons why
* (2%) Q 02 – Communicating Updates – (To an non-technical audience) proposed changes to Scenario Schedule, Budget, Equipment, and compelling reasons why
* (2%) Q 03 – Questions and Answers; Changes; Uncertainties –(To a technical audience) describe an uncertainty or ambiguity in the Scenario, your reasonable plan to address this, and how it may impact the schedule and budget.
* (2%) Q 04 – Questions and Answers; Changes; Uncertainties – (To a non-technical audience) describe an uncertainty or ambiguity in the Scenario, your reasonable plan to address this, and how it may impact the schedule and budget.

Task 05 (4% - Group Project)

Apply logic to sequence the individual tasks that define and constrain a successful project

* Logic, logical ways, and logistics
* Exercises on an “best order” for scenario of tasks
* Proposing appropriate sequencing of tasks (e.g. technical project; safety; major family meal)

**(4%) Group Project 01 - Task T 05**

Scheduling – be it using “Critical Path” or “bar chart” or other tools, methods or approaches - and adjusting it during a project, involves consideration of a sequence of tasks. In this assignment, student learner participants make a sequence of six to twelve tasks for two distinct “projects” (e.g. technical project; and safety plan). Participants then rearrange the order of the tasks for a different participant to put back in the original order. The Instructor coordinates activities such that another participant seeks to put back in order a “best fit” of the mixed up tasks. Participants review proposed re-ordered sequence by other Participant and provide feedback / discuss.

(2%) Q 01 – Proposed sequencing of tasks – Technical Project Scenario (e.g. Trouble shooting a PV – Battery storage system that supports a remote location “lighthouse” by the ocean)

(2%) Q 02 – Proposed sequencing of tasks – Safety Plan (e.g. Preparing a Site Specific Project Safety Plan based on the Technical Project Scenario, and demonstrating that it is being executed as intended.).

Task 06 (16% - Group Project)

Prepare and produce project planning documents (e.g. proposal, schedule, plan, and budget)

* Components for Belize inspired project scenarios
* Individual and Group course projects
* Exercises that are technical and otherwise

After class discussions, Instructor presents and shares example(s) or at least layouts sufficient to describe or communicate typical content of a Project Plan, Schedule, Budget and Contract.

(As selected by the Instructor or student groups) Each Group creates a different Scenario) A Scenario would include type of technical project (e.g. Small Wind, Solar Hot Water, Photovoltaic Panels, Energy Efficiency), and Site Assessment, Audit information, Working Assumptions (e.g. Location, Desired project energy performance goals, scope of project, limitations).

Also prepare a Scenario for a non-technical project (e.g. major family feast and party)

(For Scenarios selected by the Instructor) Each Group prepares Project Documents based on Scenario.

Resulting Documents are reviewed and comments on by Group that prepared original Scenario. Were expectations met? Surprises? Improvements to Scenario description? Improvements to documents?

**(8%) Group Project 02 - Task T 06**

Example of technical project planning documents (Proposal, schedule, plan, budget)

(2%) Q 01 – Project Documents – Proposal (1 page that also references other documents)

(2%) Q 02 – Project Documents – Schedule (Critical Path; Bar Chart – 2 – 4 pages)

(2%) Q 03 – Project Documents – Budget (1 page)

(2%) Q 04 – Project Documents – Plan (e.g. goals, “success”, equipment, team, task sequence, etc.)

**(8%) Group Project 03 - Task T 06**

Example of non-technical project planning documents (Proposal, schedule, plan, budget)

(2%) Q 01 – Project Documents – Proposal (1 page that also references other documents)

(2%) Q 02 – Project Documents – Schedule (Critical Path; Bar Chart – 2 – 4 pages)

(2%) Q 03 – Project Documents – Budget (1 page)

(2%) Q 04 – Project Documents – Plan (e.g. goals, “success”, equipment, team, task sequence, etc.)

Task 07 (4% - Group Project)

Employ standard estimating & scheduling procedures

* Inspired by potential Belize based, RE projects
* Scheduling (e.g. Critical Path and bar charts)
* Estimating (e.g. spreadsheet style) quantities and dollars, as planned and as regularly revised

Instructor presents templates(s) or example(s) of schedules (e.g. Critical Path and bar charts), and estimates (e.g. quantities for lists of materials, supplies, equipment, people, dollars).

(As selected by the Instructor or student groups) Each Group creates or uses a different Scenario) A Scenario would include type of project (e.g. Small Wind, Solar Hot Water, Photovoltaic Panels, Energy Efficiency), and Site Assessment, Audit information, Working Assumptions (e.g. Location, Desired project energy performance goals, scope of project, limitations).

(For Scenarios selected by the Instructor) Each Group prepares original or Version 1.0 Scheduling and Estimating documents based on the Scenario selected.

Each Group also makes revisions based on Instructor identified changes.

Resulting Documents are reviewed and discussed with Instructor. Were expectations met? Surprises? Improvements to Scenario description? Improvements to documents?

**(4%) Group Project 04 - Task T 07**

(1%) Q 01 – Scheduling (Critical Path) and then with revisions

(1%) Q 02 – Scheduling (Bar Chart) and then with revisions

(1%) Q 03 – Estimating (Quantities) and then with revisions

(1%) Q 04 - Estimating (Dollars) and then with revisions

Task 08 (6% - Group Project)

Effectively communicate project status and goals to supervisors and to clients or customers

* Project Documents – plan, schedule, budget
* Project Updates – documented, verbal, and digital
* Questions and Answers; Changes; Uncertainties

After class discussions, Instructor presents and shares example(s) or at least layouts sufficient to describe or communicate typical content of a Project Plan, Schedule, Budget and Contract.

(As selected by the Instructor or student groups) Each Group creates a different Scenario) A Scenario would include type of project (e.g. Small Wind, Solar Hot Water, Photovoltaic Panels, Energy Efficiency), and Site Assessment, Audit information, Working Assumptions (e.g. Location, Desired project energy performance goals, scope of project, limitations).

(For Scenarios selected by the Instructor) Each Group prepares Project Documents based on another Group’s Scenario.

Resulting Documents are reviewed and comments on by Group that prepared original Scenario. Were expectations met? Surprises? Improvements to Scenario description? Improvements to documents?

**(6%) Group Project 05 - Task T 08**

Communicate to Instructor / “Customer” (or regulator, supplier, contractor, or other designated person)

* (2%) Q 01 – Communicating Updates – (To an technical audience) proposed changes to Scenario Schedule, Budget, Equipment, and compelling reasons why
* (2%) Q 02 – Communicating Updates – (To an non-technical audience) proposed changes to Scenario Schedule, Budget, Equipment, and compelling reasons why
* (1%) Q 03 – Questions and Answers; Changes; Uncertainties –(To a technical audience) describe an uncertainty or ambiguity in the Scenario, your reasonable plan to address this, and how it may impact the schedule and budget.
* (1%) Q 04 – Questions and Answers; Changes; Uncertainties – (To a non-technical audience) describe an uncertainty or ambiguity in the Scenario, your reasonable plan to address this, and how it may impact the schedule and budget.