**Module 04 Assignment**

EN.645.767.1121.FA17 System Conceptual Design 20171101

Homework will consist of four assignments during the semester. The homework will be available in the Assignments tool and are expected to be completed by next class time. They are **individual work**—although any non-human source is available to you. There are many problems that may require some research outside of the class lectures and the textbook. All research for this class, however, can be accomplished via the Internet. Please remember to cite your references.

Your **team project work is collaborative** within your team by design. Please decide on a consistent method to give credit to the contributor of each major project product item (e.g. name or initials in slide footer, name after heading, etc).

All homework is due by the due date (provided in the Assignments and Schedule tools). If you are going to be late with an assignment, please let your Raytheon Instructor know (via email) at least 24 before the deadline, with an explanation of the rationale for the late submission.  Late assignments may be penalized, do not expect full credit for a late submission!

Homework submissions should be in Microsoft Word, Excel, PowerPoint, or PDF format. Please use the file naming convention (Last Name with First initial) for your uploaded submission: TEAMx**\_HW04.docx** (or .xlsx .pptx .pdf .mdxml .mdzip). Your homework will return as TEAMx\_HW04\_GRADED.docx.

For this assignment, please have one member of your team summit the assignment for all team of your team members. We’ll return feedback notes to each person based on that team’s submission.

***Team assignment***

1. Develop initial design themes

Within your teams, develop 3 design themes for your UATS System project solution. These themes should be traceable back to your stakeholder’s needs in some way. The set of your design themes should reflect the width of your stakeholder’s concerns and uncertainty about future conditions.

**Inputs**. Use any cite-able source you would like. Some ideas for inputs include:

* UATS RFI document
* Initial UATS requirements
* Customer interview
* Module 4 - Functional Allocation Matrix / Set-Based Design lecture

**Process**. Use whatever methods your team decides to produce the needed output. You can use Magic Draw or another other tool your team prefers.

**Output**. A table or diagram that shows the relationships between:

* Key UATS system stakeholders (5 ± 2 stakeholders)
* Their objectives / concerns / stakeholder needs / “care-abouts” (3 ± 2 objectives)
* Your selected design themes (3 themes).

Include a short rationale statement that defends your *set’s* coverage across major stakeholder objectives and uncertainty about future conditions. In other words, defend your 3 design themes from the question: “Do your 3 design themes *collectively* cover the priority stakeholder needs?”

***This should be done within your teams.***

***Team assignment***

1. Configuration factors & levels (Zwicky’s Morphology Box set-up)

Within your teams, develop a Zwicky Morphology Box. Your function area factors (column names) should represent the width of your system’s responsibilities. These column names are probably veeeeeery close to your top level functions from your team’s functional decomposition (i.e. OV-5a). For this homework, you only have to consider your system in the Operate Stage of its lifecycle. Your solution types (row entries beneath each factor) should be mutually exclusive. Although it would be desirable to have your collection of levels be collectively exhaustive, it is only required that they show diverse methods for solving the functional area factor problem.

**Inputs**. Use any cite-able source you would like. Some ideas for inputs include:

* UATS RFI document
* Initial UATS requirements
* Customer interview
* Functional Allocation Matrix / Set-Based Design lecture
* On-line

**Process**. Use whatever methods your team decides to produce the needed output. You can use Magic Draw or another other tool your team prefers.

**Output**. A table or diagram that shows the Zwicky Morphology Box between:

* Key functional areas across the width of your system (5 ± 2 factors)
* Different solution types to accomplish the functional area (5 ± 3 levels)

Include a short rationale statement that defends your *Morphology Box* coverage across major stakeholder objectives and uncertainty about future conditions. In other words, defend your Morphology Box from the question: “Do you offer the full range of solution types under each top-level function column?”

***This should be done within your teams.***

***Team assignment***

1. Configuration generation (Zwicky’s Morphology Box execution)

Within your teams, use your Zwicky Morphology Box to generate 3 configurations based on your 3 design themes. Start with a theme, then ask yourselves what

**Inputs**. Use any cite-able source you would like. Some ideas for inputs include:

* Your design themes
* Your Morphology Box
* Project RFI document
* Initial Project requirements
* Customer interview
* Functional Allocation Matrix / Set-Based Design lecture
* On-line

**Process**. Use whatever methods your team decides to produce the needed output. You can use Magic Draw or another other tool your team prefers.

**Output**. A table or diagram that shows your configuration choices

Include a short rationale statement that defends your *set of configuration’s* coverage across major stakeholder objectives and uncertainty about future conditions. In other words, defend your 3 configurations collectively from the questions:

* “Do your 3 configurations offer stakeholders a diverse set of solutions?”
* “Is each configuration consistent with its design theme?”

***This should be done within your teams.***