**Rubric** (Spring 2012)

# Senior Project

## Assessment of Student Outcomes of the BS in Computer Science of the School of Computing and Information Sciences Florida International University

The School of Computing and Information Sciences evaluates the Senior Projects of its graduating seniors for the purpose of assessing the level of attainment of the Student Outcomes of the BS in Computer Science program.

**Your responses to this survey will be used solely for the purpose of assessing the Student Outcomes of the BS in Computer Science program of the School of Computing and Information Sciences at FIU. This survey is expressly NOT for assessment of student performance in the SCIS Senior Project course for assignment of letter grade, nor for assessment of the instructor(s).**

Rating Instructions

***For each program outcome, you are provided with a check-list of 7 or more criteria that evidence attainment of that outcome. Please check all criteria that are presented in this project. You may include additional criteria that are not explicitly listed; if so, please record the additional criteria in the spaces provided. Unless noted otherwise, the number of checked criteria, up to a maximum of 5, should be recorded as your rating of attainment of that outcome evidenced in the project.***

Project Title ____Cloud Control_____

Semester & Year ___Summer, 2012 _____

Moderator (Faculty / Industry Sponsor): ____Steven Luis_____

Evaluators: _____Steven Luis_____

_____

_____

**Student Outcome (a)**: *Demonstrate proficiency in the foundation areas of Computer Science including discrete structures, logic and the theory of algorithms*

____ Project incorporates elements of mathematical reasoning or proof
(Lemma, Theorem, Propositional Logic, First Order Logic, Mathematical Induction)

____ Project utilizes elements of discrete mathematics
(Set Theory, Boolean Algebras, Combinatorics, Graph Theory)

____ Project utilizes some statistical procedure(s) to represent or summarize test data
(Mean, Standard Deviation, Stem Plot/Histogram, Box Plot/Percentile-Graph)

____ Project utilizes some statistical measure(s) of system behavior or performance
(Probability Distributions, Confidence Intervals, Hypothesis Testing)

__X__ Project design utilizes finite state diagrams to model system behavior

____ Project utilizes some aspect(s) of formal computer science
(Automata, Turing Machines, Recursive Function Theory, Recursive Unsolvability)

____ Project utilizes some technique(s) of numerical analysis
(Error Estimation, Interpolation, Numerical Calculus, Linear Systems, Matrix Algebra)

____ OTHER: _____

____ OTHER: _____

**Student Outcome (b):** *Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems.*

*Data Structures & Algorithms*

____ Project utilizes an advanced data structure, (search tree, hash table, priority queue, etc.)

____ Project utilizes some graph algorithm, (shortest path, minimum spanning tree, etc.)

__X_ Project documents runtime analysis of selected algorithms

*Concepts of Programming Languages*

__X_ Project utilizes knowledge of programming language syntax
(Context-Free Grammars, Parse Trees, Ambiguity, Recursive Descent)

____ Project utilizes knowledge of programming language semantics
(Natural Semantics, Interpreters, Expressions, L- and R- Value, Environments)

____ Project demonstrates familiarity with design issues such as scoping rules, dynamic type checking, static type checking

*Computer Systems (Database)*

_X__ Project utilizes or designs an appropriate database management system

____ Project utilizes conceptual and/or relational schema

__X_ Project utilizes a database query language such as SQL

*Computer Systems (Operating Systems)*

____ Project implementation utilizes knowledge of memory management

__X__ Project implementation utilizes knowledge of process synchronization

____ Project documents analysis of tradeoffs in selection of system characteristics

____ OTHER: _____

____ OTHER: _____

**Student Outcome (c):** *Demonstrate proficiency in problem solving and application of software engineering techniques.*

_X__ Project demonstrates knowledge of the Software Development Life Cycle

____ Project deliverables include Project Specification

__X_ Project deliverables include Feasibility Study and/or Project Plan

__X__ Project deliverables include Requirements Documentation

_X__ Project deliverables include Design Documentation

_X__ Project documents testing and/or evaluation of the implementation

____ Project incorporates system walkthroughs

____ OTHER: _____

____ OTHER: _____

**Student Outcome (d):** *Demonstrate mastery of at least one modern programming language and proficiency in at least one other.*

_X__ Project is implemented using an appropriate high level language

__X_ Project implementation is reasonably efficient rather than “brute force”

_X__ Project implementation is modular and/or re-usable

_X__ Project implementation uses a modern API or Tool-Kit

____ Project implementation utilizes recursion

____ Project implementation utilizes some advanced features, e.g. polymorphism

_X__ A project sub-system or module utilizes an appropriate programming language other than the primary implementation language, e.g. SQL, ML, assembly language

____ OTHER: _____

____ OTHER: _____

**Student Outcome (e):** *Demonstrate understanding of the social and ethical concerns of the practicing computer scientist*

_X__ Project documents sources and references

_X__ Project identifies and addresses any relevant social issues

_X__ Project identifies and addresses any relevant ethical issues

_X__ Project identifies and addresses relevant legal issues

__X_ Project identifies and addresses any relevant privacy issues

____ Project documents anticipated impact on users/clients

____ Project documents and addresses any anticipated technology impact issues

____ OTHER: _____

____ OTHER: _____

**Student Outcome (f):** *Demonstrate the ability to work cooperatively in teams*

To be completed by an evaluator

__X__ Project presentation(s) included all team members equally

__X__ Project team activity is appropriately and adequately documented

To be completed from the data obtained from team members' peer evaluations
Each team member rates each of the other members of their team individually on each criterion listed below on a scale of 1 to 5. The mean of all ratings for each criterion is recorded.
***The rubric item is checked only if the project (mean) score >= 4.0 for each of the 2 criteria***.

_X___ Team members' roles were clearly defined and executed

| Criterion | Mean Score |
|---|---|
| 1: *Team members had clear understanding of expectations* | 4.5 |
| 2: *Team members maximized the use of their individual skill sets* | 5.0 |

_X___ Project team set out and followed a schedule for timely completion

| Criterion | Mean Score |
|---|---|
| 3: *Team members complied with mechanisms to track progress* | 4.67 |
| 4: *Team members completed assignments in a timely fashion* | 5.0 |

_X___ Project team negotiated consensus when needed

| Criterion | Mean Score |
|---|---|
| 5: *Team members showed respect for other team members opinions* | 5.0 |
| 6: *Team members were able to negotiate and compromise* | 4.67 |

_X___ Project completion evidences equitable participation by team members

| Criterion | Mean Score |
|---|---|
| 7: *Team members contributed ideas and viewpoints* | 4.67 |
| 8: *Team members did their fair share of the work* | 5.0 |

_X___ Team members shared responsibility for success and failure

| Criterion | Mean Score |
|---|---|
| 9: *Team members actively sought & shared information from each other* | 4.5 |
| *10: Team members were adaptable to changing requirements* | 4.5 |

**Program Outcome (g):** *Demonstrate effective communication skills*

Written presentation

__X__ Completeness Project reports document all essential project features

__X__ Organization Project reports are well organized and written

Oral Presentation ***For each rubric item, check only if the mean score >= 3.0***

____ Domain Knowledge: All students are knowledgeable of all project features

| **SCORE→** CRITERIA | ***4**: Answered fully with elaboration* | ***3**: Answered but no elaboration* | ***2**: Answered basic questions* | ***1**: Unable to answer questions* |
|---|---|---|---|---|

| Presenter 1 | Presenter 2 | Presenter 3 | Presenter 4 | Presenter 5 | **mean** |
|---|---|---|---|---|---|
| | | | | | |

____ Organization: Key points presented in logical sequence which audience can follow

| **SCORE→** CRITERIA | ***4**: Clear, logical, interesting flow* | ***3**: Information in logical sequence* | ***2**: Not always easy to follow* | ***1**: Very poor sequencing* |
|---|---|---|---|---|

| Presenter 1 | Presenter 2 | Presenter 3 | Presenter 4 | Presenter 5 | **mean** |
|---|---|---|---|---|---|
| | | | | | |

____ Presentation Aids: Presentations utilized good quality slides and presentation aids

| **SCORE→** CRITERIA | ***4**: Visuals explain & reinforce topics* | ***3**: Visuals relate to topics* | ***2**: Visuals not well related* | ***1**: None or excessive* |
|---|---|---|---|---|

| Presenter 1 | Presenter 2 | Presenter 3 | Presenter 4 | Presenter 5 | **mean** |
|---|---|---|---|---|---|
| | | | | | |

____ Elocution: Presenters spoke clearly, audibly

| **SCORE→** CRITERIA | ***4**: Clear, audible, all audience hear* | ***3**: Clear, most of audience hear* | ***2**: Unclear, poor enunciation* | ***1**: Audience unable to hear* |
|---|---|---|---|---|

| Presenter 1 | Presenter 2 | Presenter 3 | Presenter 4 | Presenter 5 | **mean** |
|---|---|---|---|---|---|
| | | | | | |

____ Audience Contact: Presenters spoke directly to audience

| **SCORE→** CRITERIA | ***4**: Constant eye contact* | ***3**: Occasionally reads from notes* | ***2**: Mostly reads from notes* | ***1**: Almost no eye contact* |
|---|---|---|---|---|

| Presenter 1 | Presenter 2 | Presenter 3 | Presenter 4 | Presenter 5 | **mean** |
|---|---|---|---|---|---|
| | | | | | |

**Program Outcome (h):** *Have experience with contemporary environments and tools necessary for the practice of computing*

Competency Rating Scale **5**: Expert, **4**: Advanced, **3**: Competent, **2**: Intermediate, *1*: Novice
***Check-mark is earned if the average team competency rating is 2 or higher.***

__X__ Presentations use contemporary presentation and demonstration tools

| Domain | Software / Tool | Competency |
|---|---|---|
| Presentation | MS Powerpoint | 5 |
| Demonstration | Customized .net app | 4 |

_X___ Project artifacts are developed using modern document preparation tools

| Domain | Software / Tool | Competency |
|---|---|---|
| Document Editing | MS Word | 5 |
| Diagramming | Omni Graffle | 4 |

__X__ Implementation uses a modern programming language(s) and contemporary IDE or OS

| Domain | Software / Tool | Competency |
|---|---|---|
| Programming Language | C#, SQL, HTML, CSS | 4 |
| IDE or OS | MS Visual Studio | 4 |

__X__ Project management and/or version control software are employed

| Domain | Software / Tool | Competency |
|---|---|---|
| Project Management | MS Project | 3 |

_____ Design phase utilizes modeling software

| Domain | Software / Tool | Competency |
|---|---|---|
| UML Modeling | OmniGraffle | 4 |

__X__ Implementation includes a contemporary database management system

| Domain | Software / Tool | Competency |
|---|---|---|
| DBMS | MS SQL Management Studio | 3 |

_X__ Implementation includes web-based programming (server, web-page)

| Domain | Software / Tool | Competency |
|---|---|---|
| Web Server | .NET MVC 4 Application | 3 |

__X__ Implementation is validated using contemporary validation/testing software

| Domain | Software / Tool | Competency |
|---|---|---|
| Testing | .NET test project | 3 |

____ Other:

| Domain | Software / Tool | Competency |
|---|---|---|
| | | |

**ABET Student Outcome**

*The program must enable students to attain, by the time of graduation:*
*(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. [CS]*

Please indicate how this project "*demonstrates comprehension of the tradeoffs involved in design choices"*:

This project demonstrates comprehension of the tradeoffs involved in design choices by requiring the students to develop a communication protocol and software architecture that can scale as additional devices and network applications are added.