

**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 \_\_ GMEDS: A Geomaterials Database \_\_\_\_\_

Semester & Year \_\_ Spring 2012 \_\_\_\_\_

Moderator (Faculty / Industry Sponsor): \_\_ Giri Narasimhan \_\_\_\_\_

Evaluators: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**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)
- 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.)
- Project documents runtime analysis of selected algorithms

**Concepts of Programming Languages**

- 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)**

- Project utilizes or designs an appropriate database management system
- Project utilizes conceptual and/or relational schema
- Project utilizes a database query language such as SQL

**Computer Systems (Operating Systems)**

- Project implementation utilizes knowledge of memory management
- 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.**

Project demonstrates knowledge of the Software Development Life Cycle

Project deliverables include Project Specification

Project deliverables include Feasibility Study and/or Project Plan

Project deliverables include Requirements Documentation

Project deliverables include Design Documentation

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.**

- Project is implemented using an appropriate high level language
- Project implementation is reasonably efficient rather than “brute force”
- Project implementation is modular and/or re-usable
- Project implementation uses a modern API or Tool-Kit
- Project implementation utilizes recursion
- Project implementation utilizes some advanced features, e.g. polymorphism
- 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**

Project documents sources and references

Project identifies and addresses any relevant social issues

Project identifies and addresses any relevant ethical issues

Project identifies and addresses relevant legal issues

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  $\geq 4.0$  for each of the 2 criteria.***

Team members' roles were clearly defined and executed

<u>Criterion</u>	<u>Mean Score</u>
1: <i>Team members had clear understanding of expectations</i>	
2: <i>Team members maximized the use of their individual skill sets</i>	

Project team set out and followed a schedule for timely completion

<u>Criterion</u>	<u>Mean Score</u>
3: <i>Team members complied with mechanisms to track progress</i>	
4: <i>Team members completed assignments in a timely fashion</i>	

Project team negotiated consensus when needed

<u>Criterion</u>	<u>Mean Score</u>
5: <i>Team members showed respect for other team members opinions</i>	
6: <i>Team members were able to negotiate and compromise</i>	

Project completion evidences equitable participation by team members

<u>Criterion</u>	<u>Mean Score</u>
7: <i>Team members contributed ideas and viewpoints</i>	
8: <i>Team members did their fair share of the work</i>	

Team members shared responsibility for success and failure

<u>Criterion</u>	<u>Mean Score</u>
9: <i>Team members actively sought &amp; shared information from each other</i>	
10: <i>Team members were adaptable to changing requirements</i>	

**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

<b>SCORE→</b> <b>CRITERIA</b>	<b>4:</b> Answered fully with elaboration	<b>3:</b> Answered but no elaboration	<b>2:</b> Answered basic questions	<b>1:</b> Unable to answer questions
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Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	<b>mean</b>
4	4	3			3.67

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

<b>SCORE→</b> <b>CRITERIA</b>	<b>4:</b> Clear, logical, interesting flow	<b>3:</b> Information in logical sequence	<b>2:</b> Not always easy to follow	<b>1:</b> Very poor sequencing
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Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	<b>mean</b>
4	4	4			4

\_\_\_\_\_ Presentation Aids: Presentations utilized good quality slides and presentation aids

<b>SCORE→</b> <b>CRITERIA</b>	<b>4:</b> Visuals explain & reinforce topics	<b>3:</b> Visuals relate to topics	<b>2:</b> Visuals not well related	<b>1:</b> None or excessive
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Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	<b>mean</b>
3	3	3			3

\_\_\_\_\_ Elocution: Presenters spoke clearly, audibly

<b>SCORE→</b> <b>CRITERIA</b>	<b>4:</b> Clear, audible, all audience hear	<b>3:</b> Clear, most of audience hear	<b>2:</b> Unclear, poor enunciation	<b>1:</b> Audience unable to hear
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Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	<b>mean</b>
3	4	3			3.33

\_\_\_\_\_ Audience Contact: Presenters spoke directly to audience

<b>SCORE→</b> <b>CRITERIA</b>	<b>4:</b> Constant eye contact	<b>3:</b> Occasionally reads from notes	<b>2:</b> Mostly reads from notes	<b>1:</b> Almost no eye contact
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Presenter 1	Presenter 2	Presenter 3	Presenter 4	Presenter 5	<b>mean</b>
4	4	4			4



**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.**

Presentations use contemporary presentation and demonstration tools

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
Presentation	3	3
Demonstration	3	3

Project artifacts are developed using modern document preparation tools

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
Document Editing	3	3
Diagramming	3	3

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

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
Programming Language	3	3
IDE or OS	3	3

Project management and/or version control software are employed

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
Project Management	2	2

Design phase utilizes modeling software

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
UML Modeling	2	2

Implementation includes a contemporary database management system

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
DBMS	4	4

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

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
Web Server	4	4

Implementation is validated using contemporary validation/testing software

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>
Testing	2	2

Other:

<u>Domain</u>	<u>Software / Tool</u>	<u>Competency</u>

**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”:

**Students understood the tradeoff between implementing something from scratch versus using an existing tool and dealing with its limitations. They understood the value of using efficient search strategies for complex and interconnected data types.**