

Rubric (Spring 2011)

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 criteria checked, up to a maximum of 5, should be recorded as your rating of attainment of that outcome evidenced in the project.

Project Title ___PseudoNEXUS – Comparative Genomic Database_____

Semester & Year ___Spring 2011_____

Faculty / Industry Sponsor: ___Giri Narasimhan_____

Evaluators: ___Giri Narasimhan_____

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

_____ Project incorporates elements of mathematical reasoning or proof
(**e.g.** Lemma, Theorem, Propositional Logic, First Order Logic, Mathematical Induction)

_y___ Project utilizes elements of discrete mathematics
(**e.g.** Set Theory, Boolean Algebras, Combinatorics, Graph Theory)

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

_____ Project utilizes some statistical measure(s) of system behavior or performance
(**e.g.** Probability Distributions, Confidence Intervals, Hypothesis Testing)

_y___ Project design utilizes finite state diagrams to model system behavior

_y___ Project utilizes some aspect(s) of formal computer science
(**e.g.** Automata, Turing Machines, Recursive Function Theory, Recursive Unsolvability)

_____ Project utilizes some technique(s) of numerical analysis
(**e.g.** 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, (**e.g.** search tree, hash table, priority queue)
- _____ Project utilizes some graph algorithm, (**e.g.** shortest path, minimum spanning tree)
- _y__ Project documents runtime analysis of selected algorithms

Concepts of Programming Languages

- _y__ Project utilizes knowledge of programming language syntax
(**e.g.** Context-Free Grammars, Parse Trees, Ambiguity, Recursive Descent)
- _____ Project utilizes knowledge of programming language semantics
(**e.g.** Natural Semantics, Interpreters, Expressions, L- and R- Value, Environments)
- _____ Project demonstrates familiarity with programming language design issues
(**e.g.** Scoping Rules, Dynamic Type Checking, Static Type Checking)

Computer Systems (Database)

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

Computer Systems (Operating Systems)

- _y__ Project implementation utilizes knowledge of memory management
- _____ Project implementation utilizes knowledge of process synchronization
- _y__ 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.

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

 y Project completion evidences equitable participation by team members

 y Project presentation(s) included all team members

 y Project team activity is documented

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

 y Project team negotiated consensus when needed

 y Team members roles were clearly defined and executed

 y Team members shared responsibility for success and failure

 OTHER: _____

 OTHER: _____

Program Outcome (g): Demonstrate effective communication skills

 y Presentations described the essential features of the project

 y Presentations utilized good quality slides and presentation aids

 y Presenters utilized their time effectively

 y Presenters spoke directly to the audience

 y Technical features were communicated clearly

 y Project artifacts clearly document all project features

 y Project reports are well organized and written

 OTHER: _____

 OTHER: _____

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

 Project utilized contemporary design tools

 Project implementation utilized a modern IDE(s)

 Project utilized appropriate validation/testing tools

 Project was demonstrated using appropriate presentation tools

 Project utilized appropriate project management tools (e.g., MS Project)

 Project utilizes appropriate version control/document sharing tools

 Project documents consideration of trade-offs in selection of tools

 OTHER: _____

 OTHER: _____

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 comment on how this project “demonstrates comprehension of the tradeoffs involved in design choices”:

Detailed discussions were conducted on design tradeoffs. The team spent nearly a month exploring several available tools before deciding on the ones used in the project. The final choice exceeded all expectations.