Proposal Of A New Undergraduate Or Graduate Program

This document should not exceed 3-5 pages in length.

1. Proposing College / School: Provost -- Undergraduate Studies
   Department: Interdisciplinary Studies

2. Proposed Program Title: Information and Cyber Analysis Minor

3. CIP Code of Proposed Program: 30.9999

4. Proposed Implementation Date: Fall 2014

5. Relationship of Proposed Program to the Auburn University Mission Statement and Strategic Plan:

   (Auburn University’s mission statement may be accessed at the following site: http://www.auburn.edu/administration/trustees/policymanual/vision_and_mission.html; Auburn University’s strategic plan may be accessed at the following site: http://ocm.auburn.edu/strategic_plan/.)

   Minor is an integral component of the Cyber Initiative, one of the six Strategic Initiatives as identified in Auburn University's Strategic Plan.

6. Expected Program Outcomes and Assessment Methods:

   (Expected outcomes must be stated clearly and must include student learning outcomes and an assessment plan for ascertaining the extent to which the expected outcomes are achieved and for designing improvements based on analysis of assessment results.)

   All students will be required to maintain a portfolio for work completed in minor coursework. At a minimum, this portfolio will include:

   1. Documentation of CITI completion;
   2. Documentation (completion certificate) of the Office of the Director of National Intelligence (ODNI) Intelligence Oversight (I/O) Certification;
   3. Summaries of all class presentations and briefings to program faculty and to others as applicable;
   4. Copies of all research projects completed in coursework for minor.

   This portfolio will be utilized substantially for program assessment purposes. Program assessment consists of the following areas:

   Learning Outcome 1 (LO1): Students will demonstrate understanding of ethical issues and considerations of information analysis and research.

   Means of Assessment (LO1)
   1. Completion of CITI Basic Research Ethics Course;
   2. Completion of Intelligence Oversight (I/O) Certification;
   3. Evaluation of ethics assignment(s) in SOCY 5120, SOCY 5300, SOCY 5310, and other relevant coursework.*

   Learning Outcome 2 (LO2): Students will demonstrate competency in data acquisition, compilation, and management.

   Means of Assessment (LO2)
   1. Review of research projects in student portfolio to identify and evaluate requisite skills.*

   Learning Outcome 3 (LO3): Students will demonstrate competency in data analysis/analytics.

   Means of Assessment (LO3)
   1. Review of research projects in student portfolio to evaluate proficiency in data analysis.*
7. Degree Requirements (Including All Formal Options):
(For programs at the undergraduate level, please provide a curriculum model for the program as well as for each formal option.)

Requirements for Minor:
1. SOCY 5120 – Critical Thinking and Structured Analysis (3 hours)
2. BUAL 3600 – Business Analytics II or BUAL 5600 – Big Data I or BUAL 5650 – Big Data II (3 hours)
3. Approved electives totaling 9 hours

8. Specific Admission and/or Continuation Requirements:

Admission Requirements:
1. Application Form
2. Writing Sample

Continuation Requirements:
1. 12 of 15 hours must consist of upper division courses unless an exception is approved.
2. Successful completion and/or re-certification of Intelligence Oversight (I/O) training and CITI Basic course.
3. Students must maintain a portfolio of relevant documents and material.

9. Existing Courses and New Courses Required:

Existing Courses:
• Program is designed to meet the educational needs of the students by providing a wide exposure to analytically-oriented classes throughout the university.
• Relevant disciplines or areas include, but may not be limited to: BUAL; HIST; COMP; POLI; VBMS; ISMN; GEOG; SOCY.
• Permission will be obtained from each unit, prior to the initiation of student participation.

New Courses:
• SOCY 5120 – Critical Thinking and Structured Analysis (3 hours)
• SOCY 5300 – Information Methods and Cyber Analysis (3 hours)
• SOCY 5310 – Advanced Information and Cyber Analysis Research Methods (3 hours)

10. Relationship of Proposed Program to Other Auburn University Programs:
(If “yes” for either item, please provide explanation in the space provided below.)

Will the program support or be supported by other program(s) at Auburn University? ☐ Yes ☐ No

Will this program replace any existing program(s), or specializations / options / concentrations within existing program(s) at Auburn University? ☐ Yes ☐ No
11. New or Additional Resources / Resource Shifting Required:
(If "yes" for any item, please provide explanation in the space provided below.)

Will additional faculty lines be required?  ☑ Yes  ☐ No
Will new or additional space (e.g.: laboratory or classroom) be required?  ☑ Yes  ☐ No
Will additional library resources be required?  ☑ Yes  ☐ No
Will additional GTA support be required?  ☑ Yes  ☐ No

Explanation of or provision for new or additional resources / explanation of program's support or replacement of other programs:

Courses will be taught by existing faculty in represented departments/units. Required and elective courses (new and existing) are part of minor/major offerings in the respective department (e.g. SOCY 5120 may be used as an elective in the Sociology major; BUAL 3600 is required for all students in the College of Business and also for the Business Analytics minor/major).

12. Potential Duplication of Other Programs in the State:
(If the program would overlap with or duplicate a similar offering at another institution in the state, articulate the program's necessity and/or any differences from similar programs.)

NA

13. Collaboration With Other Institutions:
(Indicate whether or not the proposed program will -- either immediately or in the future -- involve collaboration with other post-secondary institutions. If so, provide all relevant details.)

N/A

14. Distance Education:
(If Distance Education will be incorporated in the delivery of the proposed program, provide details of implementation, scope, etc.)

Not at this time

15. Documented Need for Proposed Program:
(Elaborate upon the methodology used to appropriately assess regional, state, or national need and/or student demand for program.)

The Auburn University Strategic Plan for 2013-2018 was the result of input from people on campus and across the state who engaged in vigorous discussions and contributed ideas that have been incorporated into the Plan. Strategic Priority 3 is to enhance research, scholarship and creative work with a strategic goal to build upon institutional strengths to reflect national research priorities in the areas of Cyber security, energy and the environment, health sciences, food systems and security, STEM education and transportation. Establishing the Information and Cyber Analysis Minor is one step in supporting this strategic priority and goal. The increasing complexity of technology for Cyber security, information assurance and critical infrastructure require highly educated personnel capable of dealing with complex data sets and problem solving skills that transcend traditional academic disciplinary boundaries. Yar (2013) identifies the social sciences (including sociology), business, computing, and science/technology as key contributors to this area, noting that Cyber is more than a computer network, but also a realm of numerous social processes that includes legitimate and illegitimate activities. Cyber technology and critical analysis have now become a national and state priority that have been supported by Auburn University through its leadership with Oak Ridge National Laboratories (ORNL), the establishment of the Alabama Cyber Research Consortium (ALCRC) and its designation by the National Security Agency (NSA) as a Center of Excellence for Cyber Operations.

16. Employment Opportunities:
(Provide specific examples of employment opportunities anticipated for graduates of the proposed program.)

Business, government, and the military were consulted in the development of this minor. Without exception, they have identified the critical thinking skills promoted in this minor as integral to the current and emerging problems encountered in the rapidly evolving domains of technology and critical infrastructures.
Information and Cyber Analysis Minor (Proposed)

Elective Courses

The following list is not exhaustive. Alternate courses may be used upon approval by program faculty. The student is responsible for ensuring that all course pre-requisites are met.

Business Analytics (BUAL)
BUAL 5600*  Big Data I
BUAL 5650*  Big Data II

* If not used for required BUAL component of minor.

Computer Science (COMP)
COMP 2000  Network Programming with HTML and Java
COMP 4730  Computer Ethics

Economics (ECON)
ECON 3600  Mathematical Methods for Economists
ECON 4600  Econometrics I

Geography (GEOG)
GEOG 3810  Cartography and Graphics
GEOG 5700  Quantitative Methods and Spatial Analysis
GEOG 5830  Geographic Information Systems

History (HIST)
HIST 3800  The Historian's Craft

Information Systems Management (ISMN)
ISMN 3140  Introduction to Management Information Systems

Political Science (POLI)
POLI 3000  Political Science Research Methods I
POLI 3010  Political Science Research Methods II
POLI 4010  Constitutional Law: Government Powers
POLI 4040  Constitutional Law: Criminal Justice

Sociology (SOCY)
SOCY 3700  Research Methods
SOCY 4300  Field Experience (w/ Approved Placement)
SOCY 5300  Information Methods and Cyber Analysis
SOCY 5310  Advanced Information and Cyber Analysis Research Methods

Statistics (STAT)
STAT 3600  Probability and Statistics I
STAT 3610  Probability and Statistics II

Public Health (VBMS)
VBMS 2100  Introduction to Public Health
VBMS 3010  Introduction to Epidemiology
VBMS 4830  Global and Comparative Health Systems
Assessment data will come from the student portfolio, which will include relevant exercises, assignments, research projects, and briefings/presentations related to their program of study. Student portfolios will be reviewed annually by program faculty. In doing so, the following learning outcomes and rubrics outlined below will be used.

Learning Outcome 1 (LO1): Students will demonstrate understanding of ethical issues and considerations of information analysis and research.

Criteria:

LO1.1: Completion of CITI basic course
LO1.2: Completion of Intelligence Oversight (I/O) Certification
LO1.3: Evaluation of ethics-related assignments in SOCY 5120 and other coursework as appropriate

Measurement:

LO1.1: Certificate of Completion
LO1.2: Certificate of Completion
LO1.3: See Rubric Below

LO1.3 Assessment Rubric

<table>
<thead>
<tr>
<th>Criteria:</th>
<th>Deficient (1)</th>
<th>Average (2)</th>
<th>Superior (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will demonstrate an understanding of human subject issues (e.g., protected populations, elements of informed consent, disclosure of identifying data).</td>
<td>Student shows no or little awareness of human subject issues and their importance, such as protecting vulnerable populations, ensuring informed consent, and disclosing identifying information.</td>
<td>Student shows an adequate or basic understanding of human subject issues.</td>
<td>Student shows an exceptional understanding of human subject issues and applies this knowledge.</td>
</tr>
<tr>
<td>The student will demonstrate understanding of confidentiality as it relates to human subjects and other forms of data.</td>
<td>Student shows no or little understanding of the necessity of and requirements for ensuring confidentiality of data obtained from human subjects or from other sources.</td>
<td>Student shows an adequate or basic understanding of the necessity of and requirements for ensuring confidentiality of data obtained from human subjects or from other sources.</td>
<td>Student shows an exceptional understanding of issues related to confidentiality of data and applies this knowledge.</td>
</tr>
<tr>
<td>The student will demonstrate an understanding of rules, guidelines, procedures, and laws related to security of data.</td>
<td>Student shows no or little understanding of the importance of or in ensuring data security.</td>
<td>Student shows an adequate or basic understanding of the importance of or in ensuring data security.</td>
<td>Student shows an understanding of the importance of data security and demonstrates this knowledge in research and related activities.</td>
</tr>
</tbody>
</table>
Learning Outcome 2 (LO2): **Students will demonstrate competency in data acquisition, compilation, and management.**

**Criteria:**

LO2.1: Student will demonstrate an understanding of identifying the appropriate method(s) of acquiring data (primary or secondary) to address a research question.
LO2.2: Student will demonstrate skills in creation of datasets and/or databases using one or more sources.
LO2.3: Student will demonstrate understanding of appropriate skills associated with database management (e.g. adding data to existing files, merging data files, etc.).

**Measurement:**

Assignments and research projects in minor coursework will be evaluated in the areas described below.

LO2.1: See Rubric Below
LO2.2: See Rubric Below
LO2.3: See Rubric Below

**LO2 Assessment Rubric**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Deficient (1)</th>
<th>Average (2)</th>
<th>Superior (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO2.1: Student will demonstrate an understanding of identifying the appropriate method(s) of acquiring data (primary or secondary) to address a research question.</td>
<td>Student is unable to or demonstrates limited skill in identifying appropriate methods to address a research question.</td>
<td>Student demonstrates adequate skill in identifying appropriate methods to address a research question.</td>
<td>Student demonstrates an in-depth understanding and demonstration of skills in identifying appropriate methods to address a research question.</td>
</tr>
<tr>
<td>LO2.2: Student will demonstrate skills in creation of datasets and/or databases using one or more sources.</td>
<td>Student is unable to or demonstrates limited skill in dataset or database creation.</td>
<td>Student demonstrates adequate skill in dataset or database creation.</td>
<td>Student demonstrates exemplary skill in dataset or database creation.</td>
</tr>
<tr>
<td>LO2.3: Student will demonstrate understanding of appropriate skills associated with database management (e.g. adding data to existing files, merging data files, etc.).</td>
<td>Student demonstrates no or little proficiency in matters related to database management.</td>
<td>Student demonstrates adequate proficiency in matters related to database management.</td>
<td>Student demonstrates exemplary proficiency in matters related to database management.</td>
</tr>
</tbody>
</table>
Learning Outcome 3 (LO3): **Students will demonstrate competency in data analysis/analytics.**

**Criteria:**

LO3.1: Student will demonstrate proficiency in the proper use and interpretation of univariate statistics.  
LO3.2: Student will demonstrate proficiency in the proper use and interpretation of multivariate analytical procedures.  
LO3.3: Student will demonstrate proficiency in hypothesis testing.

**Measurement:**

Assignments and research projects in minor coursework will be evaluated in the areas described below.

LO2.1: See Rubric Below  
LO2.2: See Rubric Below  
LO2.3: See Rubric Below

**LO3 Assessment Rubric**

<table>
<thead>
<tr>
<th>Criteria:</th>
<th>Deficient (1)</th>
<th>Average (2)</th>
<th>Superior (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO3.1: Student will demonstrate proficiency in the proper use and interpretation of univariate statistics.</td>
<td>Student demonstrates limited proficiency in the use and interpretation of univariate statistics.</td>
<td>Student demonstrates adequate proficiency in the use and interpretation of univariate statistics.</td>
<td>Student demonstrates an in-depth understanding and demonstration of proficiency in the use and interpretation of univariate statistics.</td>
</tr>
<tr>
<td>LO3.2: Student will demonstrate proficiency in the proper use and interpretation of multivariate analytical procedures.</td>
<td>Student demonstrates limited proficiency in the proper use and interpretation of multivariate analytical procedures.</td>
<td>Student demonstrates adequate proficiency in the proper use and interpretation of multivariate analytical procedures.</td>
<td>Student demonstrates exemplary proficiency in the proper use and interpretation of multivariate analytical procedures.</td>
</tr>
<tr>
<td>LO3.3: Student will demonstrate proficiency in hypothesis testing.</td>
<td>Student demonstrates no or little understanding of the logic and procedures of hypothesis testing.</td>
<td>Student demonstrates adequate understanding and proficiency in the logic and procedures of hypothesis testing.</td>
<td>Student demonstrates exemplary proficiency in the logic and procedures of hypothesis testing.</td>
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</tbody>
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