

UNIVERSITY OF WISCONSIN PLATTVILLE

TRANSMITTAL FORM

FUNDING AGENCY INFORMATION 1. Agency & Program: NSF			TO BE COMPLETED BY SPONSORED PROGRAMS Deadline <input type="checkbox"/> R <input type="checkbox"/> P <input type="checkbox"/> B																																												
2. Agency Address: 4201 Wilson Boulevard Arlington, Virginia 22230			Date Submitted Mailing <input type="checkbox"/> Electronic Submission <input type="checkbox"/> Overnight <input type="checkbox"/> First Class US Mail <input type="checkbox"/> Certified																																												
3. Agency Telephone: 703-292-5111	Agency Fax:	Agency Email:	NOTES:																																												
4. Agency Web Address: www.nsf.gov																																															
PROPOSAL INFORMATION																																															
5. Principal Investigator/Dept./College/Phone: Sabina Burton Criminal Justice/LAE 342-1261																																															
6. Co-Investigator/Dept./College/Phone: Todd Carothers/Bus& Accounting/x1484 Robert Hasker/Computer Science/x1401																																															
7. Co-Investigator/Dept./College/Phone: Bill Hudson/Dean EMS/ x1561 Travis Nelson/Political Science/1808																																															
8. Project Title: Institutionalizing Cyber Education																																															
9. Proposal Type: New <input checked="" type="checkbox"/> Renewal <input type="checkbox"/> Supplement <input type="checkbox"/>			AWARD INFORMATION - TO BE COMPLETED BY OSP																																												
10. Total Request \$ 485932 Direct \$ 363272 Indirect \$ 122660			New Account: <input type="checkbox"/> Non-Federal <input type="checkbox"/> Federal																																												
11. Match Information: None			Org. Information: <input type="checkbox"/> New <input type="checkbox"/> Add To																																												
12. Begin Date: 12/1/12 End Date: 11/30/16			Total Award: Begin Date: End Date:																																												
REQUIRED CLEARANCES - does the project involve:																																															
13. Toxic, infectious or carcinogenic/Mutagenic material? Use recombinant DNA technology?																																															
14. Use of human subjects or human tissue?																																															
15. Use of vertebrate animals?																																															
16. Action involving space, remodeling, or construction?																																															
17. Hiring non-UWP personnel?																																															
18. Creation of new degree programs or services?																																															
19. Potential environmental impacts, which require review under the Wisconsin Environmental Policy Act?																																															
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PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR I certify that the plan detailed in the proposal complies with all campus, state, and federal regulations and policies and reflects University, college, and department goals. This project is achievable as described, including the limitations of time, resources, and personnel. All required clearances have been satisfied. If awarded, I agree to conduct the proposed project in compliance with 1) the conditions of the grant, and 2) with all federal policies and procedures and with all policies, procedures, and protocols mandated by UWP, UWS, and the state of Wisconsin.			Return to OSP, 516/517 Pioneer Tower SIGNATURE DATE <i>Sabina Burton</i> 4-20-2012 Typed Name: Sabina Burton																																												
DEPARTMENT CHAIR I certify that I have reviewed the proposal and found it to be complete, including required clearances, budget, and commitments involving space, faculty/staff time, and matching funds. In addition, I certify that all resources and other provisions of any award will be fulfilled. A match (check one) <input type="checkbox"/> has OR <input type="checkbox"/> has Not been pledged. Match will be satisfied by (check one) <input type="checkbox"/> a transfer of funds from org code _____ in the amount of \$ _____ and/OR <input type="checkbox"/> in-kind contributions as described in the proposal.			SIGNATURE DATE <i>Tom Caywood</i> 4/20/12 Typed Name: TOM CAYWOOD																																												
COLLEGE DEAN I certify that I have reviewed the proposal and found it to be complete, including required clearances, budget, and commitments involving space, faculty/staff time, and matching funds. In addition, I certify that all resources and other provisions of any award will be fulfilled. A match (check one) <input type="checkbox"/> has OR <input type="checkbox"/> has Not been pledged. Match will be satisfied by (check one) <input type="checkbox"/> a transfer of funds from org code _____ in the amount of \$ _____ and/OR <input type="checkbox"/> in-kind contributions as described in the proposal.			SIGNATURE DATE <i>Kory Wein</i> 4/20/12 Typed Name: Kory Wein																																												

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ASST. VICE CHANCELLOR, INFORMATION SERVICES (if required)	SIGNATURE DATE
I certify that I have reviewed this proposal and found that the computer hardware and/or software mentioned within its contents is technology and/or software that can be supported on campus.	Typed Name: Erich Matola
OFFICE OF SPONSORED PROGRAMS DIRECTOR	SIGNATURE DATE
By signing this transmittal, I certify that this proposal is consistent with campus, state, and federal regulations; is within the campus' research/service mission; and is approved for submission to the funding agency.	Typed Name: Kathryn Lomax
PROVOST/VICE CHANCELLOR OR DESIGNEE	SIGNATURE DATE
By signing this transmittal, I certify that this proposal is consistent with campus, state, and federal regulations; is within the campus' research/service mission; and is approved for submission to the funding agency.	Typed Name: Mitile Nimocks/designee

Nov 11/03

PROJECT SUMMARY

The growing number of attacks on our cyber networks has become, in President Obama's words, "one of the most serious economic and national security threats our nation faces." (Remarks by the President on Securing Our Nation's Cyber Infrastructure, 2009) University of Wisconsin-Platteville, through a funded National Science Foundation project, intends to develop a multi-disciplinary curriculum designed to streamline partnerships between the private sector, government, and academic institutions with the objective of educating students in the interests of establishing a safe, secure, and resilient cyber ecosystem. This project will result in an Applied Bachelor of Science Degree in Cyber Science with curriculum allowing students to get certificates and/or minors in cyber security specializations.

Intellectual Merit: This project contributes to the foundations of intellectual merit in the following ways:

- As a multi-disciplinary curriculum and education project in the field of cyber security it creates collaboration of teaching, learning and research in a way that clearly identifies the mutual problems of diverse stakeholders and develops cohesive solutions;
- The project connects the collaborative efforts of educators in the fields of Engineering, Business, Science, Computer Science, Math, Political Science and Criminal Justice with the private and public sector partners who are at risk;
- The project brings together local, state and international expertise to assure that the curriculum addresses issues of relevant global concern;
- The project development is focused on flexible learning tools that adapt to emerging risks and problems in all occupational fields.

Broader Impact: The broader impact of this project includes:

- Curriculum development process focused on emerging trends and issues in government, business, and education driven by a multi-discipline faculty team.
- Institutionalization of instruction based on the integration of curriculum on cybercrime and cyber security in all instructional disciplines.
- Curriculum that prepares undergraduate students for the workforce while simultaneously educating the workforce.
- Programming focused on non-traditional undergraduate students, veterans and underrepresented groups through accelerated and prior learning credit engagement.
- Educational activities that focus on business, industry, and government partnerships using undergraduate research, internships and articulated job placement agreements.
- Faculty who are educated on cyber security and assurance who can participate in the development of law and policy at the state and federal level.

Project Description

1. **Introduction:** The growing number of attacks on our cyber networks has become, in President Obama's words, "one of the most serious economic and national security threats our nation faces." (Remarks by the President on Securing Our Nation's Cyber Infrastructure, 2009) University of Wisconsin-Platteville, through a funded National Science Foundation project, intends to develop a multi-disciplinary curriculum designed to streamline partnerships between the private sector, government, and academic institutions with the objective of educating students in the interests of establishing a safe, secure, and resilient cyber ecosystem.
2. **Clear Statement of Work:** To accomplish this our project goals include:
 - a. Create an innovative multi-disciplinary curriculum focused on cyber security and cyber assurance using a collaborative design process.
 - b. Establish partnerships with business, government, law enforcement, underrepresented stakeholders, and other educational institutions to establish program sustainability and to identify critical job skills.
 - c. Use transformative learning strategies that can be quickly adapted to technological changes and victimization trends.
 - d. Build progressive program deliverables intended to accelerate the availability of courses to undergraduate students.
 - e. Design and implement a tiered instructional delivery model, replicable at other universities and college campuses that:
 - i. Leverages the use of theory and applied education.
 - ii. Disseminates successful teaching strategies
 - iii. Promotes exportable models for faculty training at other institutions.
 - f. Conduct all development strategies with a focus on the long-term goal of establishing an "Applied Bachelor's Degree" in Cyber Science that is responsive to market needs.

3. Project Description: Relation to Present State of Knowledge In Field and Capacity

The University of Wisconsin Platteville is a 4-year institution in southwest Wisconsin with an enrollment of 7674 students, 914 staff, and 76.3% 2nd year retention rate. The three largest programs are Mechanical engineering, Criminal Justice, and Business Administration. Through the Tri-State Initiative, the University has grown 41% in the last 4 years capturing students from Illinois and Iowa in a tuition waiver initiative. This project draws from the strongest programming areas at the University including Criminal Justice, Computer Science, Engineering, Political Science, and Business with the intent of developing a tiered program in "cyber sciences." The program development will be staged using a systematic approach designed to address relevant national concerns regarding cyber-crime and security with direct curriculum development direction from practitioners.

The project design intends to blend traditional applied education in cyber forensics with theoretical education in cyber-crime through an integrated curriculum. According to Special Agent Shawn Henry of the Federal Bureau of Investigation, "While it may sound alarmist, the threat is incredibly real, and intrusions into corporate networks, personal computers, and government systems are occurring every single day by the thousands. We see three primary actors in the cyber world: foreign intelligence services, terrorist groups, and organized crime enterprises. Dozens of countries have offensive cyber capabilities, and their foreign intelligence services are generally the most capable of our cyber adversaries. Their victims run the gamut from other government networks to cleared defense contractors to private companies from which they seek to steal secrets or gain competitive advantage for their nation's companies. (The Cyber Threat, 2011) Independent studies echo support of his statements. A report published in 2010 by the Poneman Institute provides overwhelming evidence of business impacts. Of particular relevance are the impacts to economic loss, the increase in cyber-attacks, and the resources invested in cyber-crime recovery. Key findings include:

- Cyber-crimes can do serious harm to an organization's bottom line. We found that the median annualized cost of cyber-crime for 50 organizations in our study is \$5.9 million per year, with a range of \$1.5 million to \$36.5 million each year per company. This represents an increase in median cost of 56 percent from our first cyber cost study published last year. (Poneman Institute Research Report, 2011)
- Cyber-attacks have become common occurrences. The companies in their study experienced 72 successful attacks per week and more than 1 successful attack per company per week. That

represented a 44 percent increase from the results from the previous year's study. (Poneman Institute Research Report , 2011)

- The most costly cyber-crimes are those caused by malicious code, denial of service, stolen devices, and web-based attacks. Mitigation of such attacks requires enabling technologies such as security integration and event management, enterprise governance, risk management and compliance solutions. (Poneman Institute Research Report , 2011)

Wisconsin is one of 10 states in the United States that does not have a cyber-forensics' program that is acknowledged as National Security Agency Center of Academic Excellence. (National Security Agency, 2009) The most recent national inventory of programs, conducted in 2006, does not include a blended multi-disciplinary education curriculum for cyber security, cyber criminology or cyber forensics. (Anandarajan, Zaman, & D'Ovidio, 2006) We believe the creation of a program that encompasses best practices in education, blends theory with applied education, and reflects the emerging need to send educated undergraduates into the work force is critical. As part of our initial evaluation, we interviewed Edward Wahl the Administrator of the Wisconsin Department of Justice, Division of Criminal Investigation. Administrator Wahl has oversight of the United States Department of Justice funded Fusion Center and the Internet Crimes against Children Task Force. He indicated, "Cyber-crime is growing at a rate that is difficult to measure. The need to have a program that integrates cross disciplines making the 4 year graduate "prepared to understand their role in reducing internet driven crime regardless of their occupational field" is a critical priority." (Wahl, 2012)

Multiple, well documented sources of information act as the key drivers for effective program development in an area that has such broad implications to create societal change. The project will be focused on needs driven by the industries that are directly experiencing the impacts of victimization with the intent of preparing undergraduate students to participate in applied learning, undergraduate research and to guarantee job placement. We have targeted project objectives that are intended to reflect the needs of the emerging priorities against an asset evaluation of inventories of our critical infrastructure, federal priorities, regionalized victimization statistics and state and campus-wide educational resources. The external inventory drivers include:

- A. Critical Infrastructure** : Defined consistently in publications as potential targets for cyber intrusion the national strategy documents for Homeland Security suggest focusing security and assessment priority on the following infrastructures:

Agriculture
Food
Water
Public Health
Emergency Services
Government
Defense Industrial Base
Information and Telecommunications
Energy
Transportation
Banking and Finance
Chemical Industry
Postal and Shipping

These elements of our Infrastructure illustrate the key development targets in our industry migration, educational planning, business job placement, and job creation priorities for our University and our student population. (Department of Homeland Security, 2011)

- B. Federal Priorities:** Clear definitions of priorities are outlined in a variety of federal guides that will focus our curriculum development work. We will build our general plan of work using the priorities of these reports and guides, in combination with a collaborative curriculum development process, focusing on the following emerging issues:
1. **Strengthen the Cyber Ecosystem** : The ecosystem will be strong when education focuses on:
 - a. Information and communication technology risk is well defined, understood and managed by users;
 - b. Organizations and individuals routinely apply security and privacy standards and best practice;
 - c. The identities of individuals, organizations, networks, services, and devices are validated;

- d. Interoperable security capabilities are built into information and communication;
- e. Where appropriate, near real-time, machine-to-machine coordination provides indication, warning, and automated incident response. (Executive Office of the President of the United States, 2011)

2. Provide Specialized and Continuing Security Training to the Cyber Workforce:

- A. Collaborate to identify and deliver specialized cyber security training which improves workforce competency levels.
- B. Develop core capabilities for the homeland security enterprise including:
- C. Improved training and education of technology professionals, allowing them to design, build and operate information technology systems that are fundamentally secure and resilient.
- D. A common body of knowledge for cybersecurity professionals.
- E. The facilitation of knowledge using classroom-based and immersive learning environments as well as rotational assignments of personnel between the public and private sectors.
- F. Development and use of capability/skills maturity models for cyber security related occupations and fields like Information Technology Management, Electronics Engineering, Computer Engineering, and Telecommunications.
- G. Capability maturity models describe the general and technical skills necessary to perform specific tasks at junior, intermediate, and senior levels. (Executive Office of the President of the United States, 2011)

3. Designs Based in Security: This theme focuses on designing and producing software systems that are resistant to attacks by dramatically reducing the number of exploitable flaws. The intention is to build capacity by developing the student capability to design, develop, and secure software systems. (Executive Office of the President of the United States, 2011)

4. Tailored Trustworthy Spaces: This theme emphasizes the need to build flexible, adaptable distributed trust authentication in computer design. This is an emerging need in the focused area of wireless technologies. (Executive Office of the President of the United States, 2011)

5. **Moving Targets:** This theme introduces the strategy of increasing the cost of cyber-attacks by deploying and operating networks and systems in a manner that makes them less deterministic, less homogenous, and less static. (Department of Homeland Security, 2011)
- C. **Priorities of Interdependencies:** Using risk assessment criteria, viability for research and development research feasibility the Department of Homeland Security has determined that Scalable Trustworthiness, Enterprise Metrics, Life Cycle Evaluation, and Combating Insiders-Malware are high priorities. It will be important to include the interdependent relationships when considering priorities for curriculum development as these interdependencies will drive system development, vulnerabilities, and intrusions. (Executive Office of the President of the United States, 2011)
- D. **Regional Victimization Indicators:** According to the Federal Bureau of Investigation's Internet Crime Complaint Center the States of Wisconsin, Illinois, and Iowa (The states that represent our Tri-State Initiative) reported in excess of 10,000 high level complaints in the year 2010 alone. (FBI, 2012) Typically, these crimes are driven to and by business and industry clusters. According to data provided by Professor Michael E. Porter of the Cluster Mapping Project, the three highest employment markets in our regional area are local commercial services, local health services, and local hospitality services. (Porter, 2012) Crime victimization data suggests that these clusters are often among the most targeted profit based enterprises for cyber-crime. This is significant as these clusters also translate into the target markets for victimization and are markets that require educated cyber security and cyber-crime professional graduates.

4. General Plan of Work: Project Objectives, Work Plan, and Project Team: Project plan is designed to target deliverable objectives tied to the project goals, a reasonable timetable, impacts on the project and project assignments. As a formal DACUM (Designing a Curriculum) is part of the project, development design aspects of the project may be modified based on partner and practitioner feedback.

A. Work plan: Goals, Objectives, and Work Design: The effectiveness of the project is mapped against specific target dates with performance impact measures descriptions, which include input, outputs, and outcomes. Inputs are defined as labor (the range of skills, expertise, and knowledge of employees), capital assets (including land and buildings, motor vehicles and computer networks), financial assets, and time

investments. Outputs are defined as defined as the goods or services produced by the project. (e.g., teaching hours delivered, welfare benefits assessed and paid). Outcomes are defined as the impacts on social, economic, or other indicators arising from the delivery of outputs (e.g., student learning, social equity, lower crime rates).

Goals and Objectives Project Period: December 2012- December 2015	Target Dates	Impact on Project	Project Assignment
Goal 1: Create an innovative multi- disciplinary curriculum focused on cyber security and cyber assurance using a collaborative design process.			
A. Organize curriculum design team	December, 2012	Input	Burton
B. Establish targeted short and long term goals for project development	December, 2012	Input	Burton
C. Engage in DACUM utilizing on-line meeting tools for off campus partners.	January, 2013 to July, 2013	Input	Team
D. Establish immediate partnerships through DACUM process for development of program design	December, 2012 through March, 2015	Input, Output, and Outcome	Team
E. Conduct focus group meetings on campus	March, 2013 through November, 2013	Input	Team
F. Formalize on-campus inventory of existing courses to integrate into curriculum	January, 2013 through July, 2013	Input, Output	Husker, Carothers
Goal 2: Establish partnerships with business, government, law enforcement, underrepresented stakeholders, and other educational institutions to establish program sustainability and to identify critical job skills.			
A. Using DACUM process identifies business, education, and investigatory partners.	July, 2013 to November, 2013	Output, Outcome	Team based on job clusters
B. Negotiate Internships, job placement and job placement agreements	January, 2014 through April, 2014	Outcome	Team based on job clusters
C. Identify potential research and development needs of partners.	December, 2014 and ongoing	Output, Outcome	Center for New Ventures

D. Establish articulation agreements between 2 year, 4 year and Master's granting Institutions	Ongoing	Outcome	Burton , Center for New Ventures
Goal 3: Use transformative learning strategies that can be quickly adapted to technological changes and victimization trends			
A. Maintain "emerging" trends focus groups with partnerships groups	2013- 2014:Quarterly	Outcome	Team
B. Develop and maintain "trends" database as part of curriculum design. This resource will allow partners to report evolving trends and provide contact information.	Deploy October 2013	Outcome	Burton Hasker
Goal 4: Build progressive program deliverables intended to accelerate the availability of courses.			
a. Begin the delivery of current courses in asset list to undergraduate students	January, 2014	Output	Team by discipline
b. Evaluate replication of traditional programming for asynchronous learning platforms.	February, 2014 through December, 2014	Output	Burton
Goal 5: Design and implement a tiered instructional delivery model, replicable at other Universities and college campuses.			
A. Leverage the use of theory and applied education through undergraduate research	Ongoing as part of curriculum design	Output	Team
B. Seek continued funding sources for undergraduate research and partnership development.	Ongoing	Output, Outcome	Burton , Hudson Center for New Ventures
C. Extend project reporting to each partnership cluster through professional presentations.	Ongoing	Output, Outcome	Team members by discipline
D. Promote exportation of model with each member publishing in professional journal.	Ongoing	Output, Outcome	Team members by discipline
E. Provide open access to curriculum content and development guides.	December 2013 and ongoing	Outcome	Burton, Husker

Goal 6: Conduct all development strategies with a focus on the long-term goal of establishing an "Applied Bachelor's Degree" in Cyber Science that is responsive to market needs.			
A. Complete on campus asset inventory and begin offering classes as part of a certificate program that can be taken by traditional undergraduate or continuing adult education learners	July , 2013	Output, Outcome	Team by discipline
B. Develop multi-discipline minor based on DACUM results.	July, 2014	Output, Outcome	Team by discipline
C. Develop "Applied Cyber Science" Bachelor Degree.	January 2015 through September 2015	Output	Team by discipline
D. Process "Applied Cyber Science" Bachelor Degree through internal university approval processes.	September 2015 through December 2016	Output	Team by discipline
E. Offer compendium of cyber science opportunities including certificate, minor and major.	July 2013 and dependent on continued funding	Output, Outcome	Team by discipline
F. Duplicate, as parallel development strategy, hybrid, and on-line courses pushing the opportunities to the larger market focusing on underserved populations, veterans, and on-traditional learners.	Ongoing	Output	Team by discipline
G. Conduct quality assessment of curriculum	Ongoing based on delivery of courses	Outcome	Team by discipline
H. Conduct placement evaluation based on receipt of education	Ongoing based on student program completion	Outcome	Team by discipline
I. Conduct partnership evaluation of student work performance as an Indicator of program success	Ongoing based on student program completion and continued funding	Outcome	Team by discipline

B. Intellectual Merit: Relationship between Project, Principal, Co-Principal Work, and Expertise:

The project team is made up of a multi-disciplinary team of Professors:

Dr. Sabina Burton: Principal Investigator—Dr. Burton will coordinate project activity and manage the administrative functions of the project. Dr. Burton is an Assistant Professor in the Criminal Justice Department. Dr. Burton has a Ph.D. in Social Ecology, has 13 published works, and is an international expert on terrorism.

Dr. William Hudson, Dean of EMS: Co-Principal Investigator: Dr. Hudson will serve as a liaison to the Science, Education, Technology, and Math Departments. Dr. Hudson is the Dean of the Engineering, Math and Science Department has a Ph.D. in Electrical Engineering, has been working in adult education for 28 years, has been directly involved in over 51 grant projects, has written 16 published works, developed and/or taught 35 courses and has participated in over 50 presentations.

Dr. Robert Hasker, Co-Principal Investigator: Dr. Hasker is a Professor of Computer Science with 29 years of experience in teaching and curriculum development. Dr. Hasker has a Ph.D. in computer science and has taught and/or developed over 30 computer software courses.

Dr. Travis Nelson, Co-Principal Investigator: Dr. Nelson is an Assistant Professor of Political Science. Dr. Nelson has a Ph.D. in Political Science with an emphasis in International Relations and has been teaching and/or developing courses for 6 years. Dr. Nelson's primary expertise is in the field of International Security and American Foreign Policy.

Todd Carothers, Co-Principal Investigator: Mr. Carothers is an Assistant Professor of Business, holds a Master's Degree in Business Administration, is a Certified Public Accountant, a Certified Management Accountant and a Certified Production and Inventory Manager. Mr. Carothers has 10 years of industry experience and 2 years of teaching experience.

Center for New Ventures (CNV): CNV is our partnership coordination, intellectual property, and business planning outreach center. CNV monitors projects that may lead to outcomes that require effective research and development strategies.

C. **Priorities of DACUM:** The design of the curriculum will bring together our project team with our top 20 business and industry employers, representatives from law enforcement task forces assigned to cyber-crime, previous graduates, and students with an interest in this field together with our project team. The measurement and evaluation strategies are linked to the goal and objectives work plan. The primary objectives of the DACUM will include:

1. Development of programming to educate high quality information assurance and cyber-security professionals.
2. Generation of blended program design that will integrate curriculum components throughout the STEM disciplines on campus.
3. Curriculum that is developed using articulable standards so it can be used for modeling and adoption nationally.
4. Curriculum that integrates with applied industry needs to easily facilitate creation of internships, advanced job placement programming and fast track hiring for employers.
5. Curriculum development and delivery strategies that are coordinated with the University of Wisconsin-Platteville Prior Credit Learning Project so veterans, non-traditional students and first generation college students gain applied credit for previous academic and work experiences.
6. An emphasis on institutionalizing undergraduate research experiences in the emerging programs.

6. **Impact Statements:** This project will have the following impacts.

- A. **Short term:** This project will bring the disciplines of criminal justice, business, engineering, computer science, and political science together with industry clusters in a systematic curriculum development project.
- B. **Long Term:** The project will generate a continuing adult education certificate, a minor and an undergraduate degree tailored to address a critical, rapidly evolving societal problem. The project will generate graduates and educate cyber security and cyber

assurance professionals that are currently employed. Integration of distance education, through alternative funding sources, will allow us to deploy the curriculum globally.

- C. **Under-represented groups:** During the curriculum design, we will be targeting veterans, underserved minorities, and first generation college students in student recruitment. The project team intends to engage our Office of Minority Affairs and our Office of Veteran Services in the curriculum design process. The DACUM will have representatives from four minority owned businesses.
- D. **Project Dissemination and Communication:** In addition to the NSF program reporting requirements the project team will :
1. Maintain an active blog, which outlines the project development success.
 2. Present, by discipline, at two national conferences annually, on the project and its outcomes.
 3. Aggressively seek opportunities to publish in professional journals outlining project outcomes.
 4. Present project report information at all department meetings.
 5. Maintain an active electronic "emerging trends" journal for unilateral reporting between partners.
 6. Provide reports, processes, and curriculum outputs in "open source" environment for use by other government, business, and academic institutions.
- E. **Broad Societal Impacts:** This project has the following broad societal impacts:
1. The collaborative curriculum design brings together multi-disciplines and partners from business, industry, and government to examine emerging trends in the cyber science fields. The cooperative nature of this process will promote communication, learning, partnership and encourage "program investment" which will translate into program and impact sustainability.
 2. Underrepresented stakeholders will be engaged in curriculum design, program development and will be asked to sponsor undergraduate students.
 3. The program design objectives are to educate employed professionals (Faculty, business, industry, and government) and undergraduate students in cyber security and cyber assurance. Our minimal impacts will generate multi discipline awareness in the education fields, which will translate to the workplace. Once

the project matures, we will be graduating cyber service experts who will improve infrastructure security, impact cyber security policy, effectively mitigate cyber- crime risks and reduce the impact of cyber- crime on society.

- 4. The design strategy for this program development will result in networking between a variety of program areas that traditionally have "siloed" their programs and curriculum. Initially this will occur on our campus, but as the project, team communicates its development and delivery methods using a modeling approach to our partnership clusters we anticipate that we will affect a variety of academic disciplines that do not normally collaborate.**

Works Cited

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Template for NSF Data Management Plan. In general, the data management plan should answer these two questions: 1) *What data is generated by your project?* 2) *What is your plan for managing the data?*

1. Expected Data

Describe the types of data, samples, physical collections, software, or other material to be produced in the course of the project.

2. Data Format

Describe the format in which the data or products are stored (e.g., hardcopy notebook and/or instrument outputs, ASCII, html, jpeg or other formats). Where data are stored in unusual or not generally accessible formats, explain how the data may be converted to a more accessible format or otherwise made available to interested parties. You may also comment on the current or anticipated need for interested parties outside of your laboratory to access your primary data.

3. Access to Data and Data Sharing Practices and Policies

"Access to data" refers to data made accessible without explicit request from the interested party, for example those posted on a website or made available to a public database. Describe your plans, if any, for providing such general access to data, including websites maintained by your research group, and direct contributions to public databases (e.g. IRIS for seismological data, Cambridge Crystallographic Data Centre, Inorganic Crystal Structure Database, the Protein Data Bank, Space Physics Data Center (SPDF), the National Space Science Data Center (NSSDC), Planetary Data System, etc.). Also note if you submit your data in the form of tables, graphs, computer code or other format to the supplementary materials sections of peer-reviewed journals. Describe your practice or policies regarding the release of data for access, for example, whether data are posted before or after formal publication.

"Data sharing" refers to the release of data in response to a specific request from an interested party. Describe your policies for data sharing, including (if applicable) provisions for protection of intellectual property, national security, or other rights or requirements.

4. Policies for Re-Use, Re-Distribution

Describe your policies regarding the use of data provided via general access or sharing. For example, if you plan to provide data and images on your website, will the website contain disclaimers, or conditions regarding the use of the data in other publications or products? Describe these disclaimers and/or terms of use.

5. Archiving of Data

Describe how data will be archived and how preservation of access will be handled. For example, will hardcopy notebooks, instrument outputs, and physical samples be stored in a location where there are safeguards against fire or water damage? Is there a plan to transfer digitized information to new storage media or devices as technological standards or practices change? Will there be an easily accessible index that documents where all archived data are stored and how they can be accessed? How long will data be retained?

Budget Justification

A. Key Personnel (Includes PI and Co-PI/s) Personnel Total 3 years:

Dr. Sabina Burton: Principal Investigator—Dr. Burton will coordinate project activity and manage the administrative functions of the project. She is an Assistant Professor in Criminal Justice and an expert on International terrorism. She will be funded for two months per calendar year, each year of the 3 year project period. An escalation rate of 3% per year for Dr. Burton's salary has been calculated for the period of the grant. Her total salary request is \$35373.00

Dr. William Hudson, Dean of EMS: Co-Principal Investigator: Dr. Hudson will serve as a liaison to the Science, Education, Technology, and Math Departments. Dr. Hudson will be actively involved in the project; however, Dr. Hudson's project commitment for this type of project is part of his current compensation and job description.

Dr. Robert Hasker, Co-Principal Investigator: Dr. Hasker is a Professor. Hasker has a Ph.D. in computer science and will assist in the curriculum development and project assessment. He will be funded for two months per calendar year, each year of the 3 year project period. An escalation rate of 3% per year for Dr. Hasker's salary has been calculated for the period of the grant. His total salary request is \$55,446.00 for the 3 year project.

Dr. Travis Nelson, Co-Principal Investigator: Dr. Nelson is an Assistant Professor of Political Science. Dr. Nelson has a Ph.D. in Political Science with an emphasis in International. He will be funded for two months per calendar year, each year of the 3 year project period. An escalation rate of 3% per year for Dr. Nelson's salary has been calculated for the period of the grant. His total salary request is \$34,312.00 for the 3 year project

Todd Carothers, Co-Principal Investigator: Mr. Carothers is an Assistant Professor of Business, holds a Master's Degree in Business Administration, is a Certified Public Accountant, a Certified Management Accountant and a Certified Production and Inventory Manager. He will be funded for one month per calendar year, each year of the 3 year project period. An escalation rate of 3% per year for Dr. Carothers' salary has been calculated for the period of the grant. His total salary request is \$21,225.00 for the 3 year project.

The total for this category is \$146,356.00

B. Other Personnel (Includes non-Key personnel; that is, members who will not be playing a leadership role, but will contribute through their labor, such as graduate students, postdocs, technicians, and administrative staff)

Web Development and Technical Assistance: Web development staff will be assigned to the project for the duration of the project period. Their time is calculated at a flat fee of 300 hours per year at

\$50.00 per hour. They will have responsibility for creating the web blogs, managing web streaming and updating site content for the project. The compensation is \$15,000.00 per year for the 3 year project with no escalation in costs totaling \$45,000.00 for the project period.

Undergraduate Students: This project requires undergraduate students for curriculum development , for curriculum testing (undergraduate research) and to assist with project work. We anticipate needing approximately 833 hours of student work per year. This totals \$30,909.00 for the project period.

The total for this category is \$75,909.00

C. Fringe Benefits

The fringe rate for staff is 31 percent for faculty, 4% for undergraduate students and 22% for the LTE. This totals \$56,507.00 for the project period.

D. Equipment (Items of durable value exceeding \$5,000) There is not equipment required for this project.

E. Travel

Year 1: One national conference meeting for each of the 5 represented disciplines at \$2000.00 per meeting which includes registration, lodging, travel and meals. This totals \$10,000.00 . 20 site visits split by discipline at \$750.00 per visit. This will cover the costs of transportation and meals. Partnership sites and conference priorities will be established during the planning process. The total travel amount is \$25,000.00

Year 2:

Year 2: One national conference meeting for each of the 5 represented disciplines at \$2000.00 per meeting which includes registration, lodging, travel and meals. This totals \$10,000.00 . 20 site visits split by discipline at \$750.00 per visit. This will cover the costs of transportation and meals. Partnership sites and conference priorities will be established during the planning process. The total travel amount is \$25,000.00

Year 3:

Year 3 : One national conference meeting for each of the 5 represented disciplines at \$2000.00 per meeting which includes registration, lodging, travel and meals. This totals \$10,000.00 . 20 site visits split by discipline at \$750.00 per visit. This will cover the costs of transportation and meals. Partnership sites and conference priorities will be established during the planning process. The total travel amount is \$25,000.00

The total for travel, lodging and meals for the 3 year project is \$60,000.00

F. Participant Support Costs

Year 1: Student stipends are designed to compensate students who are from "underserved" populations for compensation for their time for curriculum and project meetings. We anticipate working with 30 students at \$250.00 per student. Each of the students will need to travel to partnership sites or come onto our campus for the meetings. We will reimburse them for travel at \$100.00 per student. This totals \$10,500.00

Year 2: Student stipends are designed to compensate students who are from "underserved" populations for compensation for their time for curriculum and project meetings. We anticipate working with 10 students at \$250.00 per student. Each of the students will need to travel to partnership sites or come onto our campus for the meetings. We will reimburse them for travel at \$100.00 per student. This totals \$3500.00 The total for year 2 is \$3500.00

Year 3: There will be no student stipend expenses in year 3.

The total is \$14,00.00 for this category

G. Other Direct Costs

1. Supplies:

There are not supply costs.

2. Publication Costs:

In Years 1 we request \$3000.00 and in Year 2 we request \$3000.00 to duplicate and print curriculum development guides and to prepare hand-out for faculty and student presentations. In Year 3 we require \$4500.00 to provide full curriculum guides, presentation posters and program information flyers.

Total: \$10,500.00

3. Consultant Services:

We are not employing outside consultants.

4. Computer Services:

We require no computer services.

5. Subawards: There will be no sub awards.

6. Other:

There are not additional costs.

H. Indirect Costs (Our indirect cost is based only on salary and benefits as facilities are not included in the budget)

The indirect cost is 44% against the salary and benefits. This is an approved indirect rate.

**SUMMARY
PROPOSAL BUDGET**

Cumulative

PROPOSAL BUDGET				FOR NSF USE ONLY			
				PROPOSAL NO.	DURATION (MONTHS)		
ORGANIZATION University of Wisconsin Platteville					PROPOSED	GRANTED	
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR				AWARD NO.			
A. SENIOR PERSONNEL: P/MPD, Co-PI'S, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)				NSF-Funded Person-months		Funds Requested By Proposer	Funds Granted by NSF (If Different)
				CAL	ACAD	SUMR	
1. Sabina Burton				6		\$ 35,373	
2. Travis Nelson				8		\$ 34,312	
3. Robert Hasker				8		\$ 55,446	
4. Todd Carothers				3		\$ 21,225	
5. William Hudson						\$ -	
6. () OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)							
7. () TOTAL SENIOR PERSONNEL (1-6)				21		\$ 146,356	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)							
1. () POST DOCTORAL ASSOCIATES						\$ -	
2. () OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)						\$ 45,000	
3. () GRADUATE STUDENTS						\$ -	
4. () UNDERGRADUATE STUDENTS						\$ 30,909	
5. () SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)						\$ -	
6. () OTHER						\$ -	
TOTAL SALARIES AND WAGES (A+B)						\$ 222,265	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)						\$ 58,507	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)						\$ 278,772	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000)							
TOTAL EQUIPMENT						\$ -	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)						\$ 60,000	
2. FOREIGN						\$ -	
F. PARTICIPANT SUPPORT COSTS							
1. STIPENDS \$10,000							
2. TRAVEL \$4,000							
3. SUBSISTENCE							
4. OTHER							
() TOTAL PARTICIPANT SUPPORT COSTS						\$ 14,000	
G. OTHER DIRECT COSTS							
1. MATERIALS AND SUPPLIES						\$ -	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION						\$ 10,500	
3. CONSULTANT SERVICES						\$ -	
4. COMPUTER SERVICES						\$ -	
5. SUBAWARDS						\$ -	
6. OTHER						\$ -	
TOTAL OTHER DIRECT COSTS						\$ 10,500	
H. TOTAL DIRECT COSTS (A THROUGH G)						\$ 363,272	
I. INDIRECT COSTS (F&A) (SPECIFY RATE AND BASE)							
off campus Base = \$ -							
on campus 44% Base = \$ 122,660							
TOTAL INDIRECT COSTS (F&A)						\$ 122,660	
J. TOTAL DIRECT AND INDIRECT COSTS (H+I)						\$ 485,932	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECT SEE GPG II.D.7.)							
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)						\$ 485,932	
M. COST-SHARING: PROPOSED LEVEL \$				AGREED LEVEL IF DIFFERENT \$			
PI/MPD TYPED NAME & SIGNATURE*				DATE	FOR NSF USE ONLY		
					INDIRECT COST RATE VERIFICATION		
ORG. REP. TYPED NAME & SIGNATURE*				DATE	Date Checked	Date of Rate Sheet	Initials-ORG
Shane Gilkey							

Data Management Plan

What data will be generated?

This project is designed primarily as a curriculum development rather than a research project. However because the goal is to provide a foundation for future research studies, the data will be managed as for a research project. The measures and approaches qualify for exemption from IBR review under 45 CFR 46.101(b).

Data will consist of notes and transcriptions of discussions and focus groups, reports and reviews, summaries, curricular materials, and both quantitative and qualitative evaluations of the capacity-building workshops and the impact of implementation on trainees of the faculty participants in the workshops. Materials will all be created *de novo* or transcribed into standard Microsoft Office applications (Word, Excel, and PowerPoint). For the purpose of wider, long-term access, primary documents will be converted at regular intervals into Adobe portable document files (PDF).

What is your plan for managing the data?

Audience for Data: The workshop curriculum will be of primary *educational* interest to those responsible for institution-wide curriculum development. It is anticipated that individuals with an ongoing interest in cyber security and assurance education will download and use the curricular materials to teach capacity-building workshops in their own institutions. The workshop curriculum, proposed measurable outcomes, and other data will be of primary development interest to those who wish to study the effectiveness with other stakeholders.

Access and Sharing: The educational and research data resulting from this project will be made available for use by both educators and researchers as soon as completed in reasonable intervals throughout the projects with the final products to be completed no later than the conclusion of the project. These materials, available as standard Microsoft Office files, pdf documents, and tab-delimited files, will be widely and freely disseminated minimally at the University of Wisconsin Platteville Cyber Service Project blog. .

Format: Submission: Primary data will all be created *de novo* or transcribed into standard Microsoft Office (Word, Excel, and PowerPoint) files. **Storage and Access:** Files will be stored and available both in original format and as pdf documents. In the case of answers to forced-choice and open-ended questions, data will be stored both in pdf and tab-delimited formats for the purpose of subsequent statistical analyses.

Ethics and Privacy: Although this project is exempt from our IRB processes an informed consent process will include language to ensure that all participants understand that these data are being generated for the purpose of sharing with the research community. Data from this project are unlikely to pose a risk for disclosure; however, to further protect participants, data will be de-identified before long-term storage.

Intellectual Property Rights: During the conduct of this project, all ownership rights rest with the institution University of Wisconsin-Platteville. The sharing of research results will be

consistent with UW-Platteville and UW-System policies governing intellectual property, copyright, and the dissemination of research products. On completion of the project, the intention is that all data and materials should be freely available for use by the research community.

Storage and Backup: To ensure ongoing and long-term security of the data generated by this project, a complete copy of materials will be generated and stored independently on primary and backup sources for both the PI and Co-PI (as data are generated) and with all members of any Expert Panel (every 6 months).

Archiving and Preservation: On completion of the project, the PI and Co-PIs will identify which project materials are of probable long-term interest for archiving and preservation. Materials will be anonymized or de-identified as appropriate, converted to searchable pdf document format, stored locally on UW-Platteville computers, copied and distributed to all stakeholders, and transmitted to the University of Wisconsin system offices for curriculum access by all interested institutions. Because this project is not a primary research project, it is less important that data be retained indefinitely; however, it is reasonable to assume that these baseline data will inform future research sufficiently soon that secure and complete retention will be needed for up to 10 years.