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Wyoming Community College Commission
Request for
New, Pilot or Revised Degree or Certificate

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A. **College:** Laramie County Community College

B. **Date** submitted to WCCC**: _____**

C. **Program**
1. Request for:
   X New Program   ____ Pilot Program   ____ Revised Program

2. **Program Title:** Cybersecurity

3. Degree or Certificate to be awarded:
   ____ Degree: ____ AA   ____ AS ____ AAS   ____ Other
   X Certificate

4. Educational Pathway:

   __ Energy __ Construction __ Hospitality X Technology __ Health Care __ other

5. Total number of credit hours: 27

5. Suggested CIP (Classification of Instructional Program) code (6-digit):
   52.2101

6. Planned semester/year new program will begin: Fall 2015

8. Will any part of this program be provided by non-accredited vendor(s)?
   ____ YES (Provide details)   X NO

   Will all or part of this program be available to students via online or other distance education technologies?

   X At the start of the program?   ____Within three years of the start of the program?   ____No

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D. <u>Program description</u> as it will be included in college catalog:
   (Type description here)

Businesses and government agencies face constant threats from the cyber world on a daily basis, creating a need for professionals to protect financial information, personal data, and trade secrets from online threats. The Cybersecurity Credit Diploma program is designed to prepare students for a career as a cybersecurity professional by giving them the knowledge and tools needed to safeguard the internet.

1. Expected Student learning outcomes from completion of the program: Students will be able to:

- Implement computer network security attacks
- Assess a computer system's security vulnerabilities and apply appropriate counter measures
- Conduct penetration tests
- Utilize knowledge of critical infrastructure to assess risk and threat assessments
- Use standard software tools to detect security breaches and attempted security breaches of computing systems
- Understand professional responsibilities in the areas of privacy, property rights, ethics, and codes of conduct.
- Sit for the following certifications exams: CCNA (Cicso Certified Network Administrator), CompTIA Linux+, CEH (Certified Ethical Hacker), CHFI (Computer Hacking Forensic Investigator)

2. Program Layout by Semester

CSEC/HSEC 1500	Network Security Fundamentals	3
CSEC/HSEC 1510	Network Defense Principles	3
CSEC/HSEC 1520	Network Attack Principles	3
CSEC/HSEC 1530	Computer Forensics	3
BADM 1000	Introduction to Business	3
	Semester Hours Total: 15	
HSEC 1000	Introduction to Homeland Security	3
HSEC 1015	Homeland Security and Critical Infrastructure	3
HSEC 2001	Homeland Security Legal, Policy and Privacy Issues	3
HSEC 2013	Cybersecurity Capstone	3
	Semester Hours Total: 12	
	Total Program Semester Hours	27

E. **New course prefixes:**
1. Recommended Level of Instruction if the community college is using a<u>new</u> course prefix:

     <u>X </u>No new prefixes

     <u>   </u> Suggested level of instruction

2. <u>New</u> Course prefixes, numbers and titles have been coordinated:
    with UW (transfer)   <u>X </u>Yes   ____ No   ____ Not Applicable

    or WCCC (career technical) ____ Yes   ____ No <u>X</u> Not Applicable

F. **New course descriptions:**
The following are course descriptions for each <u>new</u> course in the program (include prefix, course number, title, credit hours and description):

CSEC/HSEC 2013 Cyber Capstone: Students demonstrate the knowledge and skills they have acquired throughout the Cybersecurity program within a Cyber Range, a controlled virtual environment designed to test student ability to protect systems against cyber attacks under realistic conditions. After completion of the practical portion of the lab, students develop a new policy or procedure to add to current cybersecurity practices. Prerequisites: Instructor Consent. Cross listed as CSEC 2013

CSEC/HSEC 1500 Network Security Fundamentals: This course is designed to give students a fundamental understanding of computer and network security. It will introduce students to a wide variety of concepts related to computer security. This course will help prepare the student for the CompTIA Security + Certification. Prerequisite: Concurrent enrollment in or completion of: CSCO 2000.

CSEC/HSEC 1510 Network Defense Principles: This course provides students and professionals with hands-on introductory experience installing firewalls and intrusion detection systems. This course gives students a solid foundation in advanced network security fundamentals, incorporating examination of intrusion detection, network address translation, packet filtering, proxy servers, firewalls, and virtual private networks. Course content includes network defense fundamentals, risk analysis, security policy implementation, network traffic signatures, virtual private network concepts, VPN implementation, intrusion detection system concepts, incident response, choosing and designing firewalls, firewall topology, strengthening and managing firewalls, and strengthening defense through ongoing management. Prerequisite: Concurrent enrollment in or completion of: CSCO 2000.

CSEC/HSEC 1520 Network Attack Principles: This course will immerse students in interactive lab environments to learn how to scan, test, hack, and secure systems. Students will gain insight into perimeter defenses and attacker tactics, as well as Intrusion Detection, Policy Creation, Social Engineering, DDoS Attacks, Buffer Overflows, and Virus Creation. This course will help prepare the student for the EC-Council Certified Ethical Hacker (CEH) Certification. Prerequisite: Concurrent enrollment in or completion of: CSCO 2000.

CSEC/HSEC 1530 Computer Forensics: This course will offer students a detailed methodological approach to computer forensics and evidence analysis. Students will learn the skills necessary to acquire and handle digital evidence, identify and track cybercriminals, and complete computer investigations. This course will help prepare the student for the EC-Council Certified Hacking Forensic Investigator (CHFI) Certification. Prerequisite: Concurrent enrollment in or completion of: CSCO 2000.

G.   **Can this program be delivered by current faculty?** If not, what are the plans, budget and timeline for bringing on needed instructors?

Yes, all but one course is already offered at LCCC.

H. **Summary of input from and coordination with citizens, business and industry or k-12 education:**

We have worked with the Wyoming Office of Homeland Security, the Federal Emergency Management Agency (FEMA), Cheyenne Police Department, Laramie County Sheriff's Office, the Department of Homeland Security (DHS), and EchoStar to develop this degree plan to meet both immediate job openings and the expected future growth of this field. EchoStar has provided a letter that accompanies this form that speaks to the degree plan and how it will assist them in their hiring needs. Also attached is a letter from FEMA to WOHS stating that if this degree is developed under the Homeland Security Program that the current FEMA Grant for tuition assistance can be used for this new degree and certificate.

I. **Resources required** to start and sustain the program and the current plan to meet those resource needs through college or other external funds:

As stated earlier this degree plan is made up of existing course with the exception of the Cyber Capstone. This course will be developed

through available grants and through partnerships with Wyoming business.

J. Projected demand in Wyoming and Nation for five years from proposed implementation date (career technical programs):

1. State and National Trends

United States	Employment		Percent Change	Job Openings
	2010	**2020**		
Information Security Analyst	75,100	102,500	37	27,400
Wyoming	**Employment**		**Percent Change**	**Job Openings**
	2004	**2014**		
Information Systems Analyst	No Data	No Data		

Source:
- **National Data Source:** Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2010-11 Edition*, Fitness Workers, on the Internet at http://www.bls.gov/oco/ocos287.htm
  .
- **State Data Source:** Wyoming Department of Employment Research & Planning http://doe.state.wy.us/lmi/proj2005/long_occ2014.htm

Other trend information that would assist the Commission:

See attached 2013 ISC2 Global Information Security Workforce Study

2. State and National Wages

Location	Pay Period	2008				
		10%	**25%**	**Median**	**75%**	**90%**
United States	Hourly	$21.82	$28.10	$36.30	$46.06	$56.94
	Yearly	$45,390	$58,460	$75,500	$95,810	$118,440
Wyoming	Hourly	No Data	No Data	No Data	No Data	No Data
	Yearly					

Source: Bureau of Labor Statistics, Occupational Employment Statistics Survey
- **National Data Source:** http://www.bls.gov/oes/2008/may/oes151051.htm
- **State Data Source:** http://www.bls.gov/oes/oes_dl.htm   State Cross-Industry Estimates

Other wage information or comments that would assist the Commission:

3. Primary student audience identified for this program:

   The primary audience for this degree and certificate will be professionals looking to retrain into cybersecurity from other IT professions, along with those looking for a new career.

4. Anticipated enrollment in the three academic years after WCCC approval (unduplicated headcount) with the basis for the estimate:

   <u>10</u> Year One   <u>15</u> Year Two   <u>20</u> Year Three

This is based off the current growth seen within this field along with the input received from various government agencies and local and national employers.

K. <u>Student recruitment and program marketing strategies</u> to attract the broadest range of individuals for this particular program:

This program will attract students as it will be only the second one in the nation and the first in the academic world to offer a kinetic cyber world for students to validate their skills in the Cyber Capstone course. This world will be built around a scale model of a town with all the cyber pieces that are found in the real world. This will include railroad, air traffic control, public utilities, 911 dispatching, banking, a data center, and cellular.

L. <u>Identification of similar programs at Wyoming Community Colleges</u> and an overview of results **<u>of discussions with faculty and administrators</u>** at the relevant colleges regarding curriculum and possible joint projects:

Wyoming Community College Programs (Identify title, degree/certificate and number of credit hours)						
Casper College	**Central Wyoming College**	**Eastern Wyoming College**	**Laramie County Community College**	**Northwest College**	**Northern Wyoming Community College District**	**Western Wyoming Community College**
AAS and AS in Computer Security, 64 Credit Hours	N/A	N/A	Currently Developing	N/A	N/A	N/A

M. <u>Note available program and course articulations</u> with other likely transfer institutions in the region, particularly for transfer AA and AS programs. (Note regional Bachelor of Applied Science transfer options in addition to UW.)

Currently, there is interest from Excelsior College in an articulation agreement if we develop this degree plan.

N. <u>When appropriate, note partnerships with business, industry, associations or agencies</u> that have contributed to the design of the proposed program and/or who will contribute to the delivery of the program.

Department of Homeland Security (DHS)
Federal Emergency Management Agency (FEMA)
CyberWatch West
Wyoming Office of Homeland Security (WOHS)
Laramie County Emergency Management
Laramie County Sheriff's Office

Cheyenne Police Department
EchoStar

O. <u>Assessment of student learning and completer follow-up per performance indicators.</u> How will the assessment outcomes be used to assure student learning and improve the program?
Students will be able to:

The cyber world is constantly changing and only through the use of student and local employer feedback can we provide a successful degree and certificate. When deficiencies within this program are noted we will evaluate our academic plans and MCORs to find the best way to improve the presented course work and material.

P. <u>Other program information or comments</u> that would assist the commission in making a decision using the Guidelines for Use of this Evaluation Tool found in Appendix A of the 2010 <u>WCCC Statewide Strategic Plan.</u>

This program addresses Wyoming and regional interests in the following ways:

EDUCATED CITIZENTRY – Through this program, students may earn either a certificate or associates degree, thus increasing the number of post-secondary education certificates and degrees in Wyoming. With the increasing integration with the cyberworld, we will have local, knowledgeable professionals able to secure information and systems which, in turn, will benefit the state and its citizens as a whole.

DIVERSIFIED ECONOMY – This program helps build the technical skills required to support the changing world of cyber security. Because most businesses and government entities are thoroughly integrated with the cyberworld, professionals educated in the security of all types of information and systems are vital to all aspects of the economy. This makes cyber security professionals relevant across all industries.

WORKFORCE DEVELOPMENT – This program is designed to create an entry-level professional, as well as enhance current professionals' needs. Because the cyberworld is constantly changing and cyber security practices are always developing, creating opportunities for educational development is crucial and will be provided through this program.

EFFICIENT SYSTEMS – During this degree program, students will have the opportunity to obtain numerous IT certifications. This will allow students to

further their cyber security education in a variety of ways. Also, we are currently trying to develop articulation agreements to create a seamless educational path to a four year institution.

ACCOUNTABILITY and IMPROVEMENT – This program utilizes its community partners to create an up-to-date program that is immediately relevant to current industry needs. It is with these partners that the program is reexamined at least twice a year so as to be competitive, relevant, and accountable to assure students receive a tailored education suited to today's needs, both locally and nationally.

OTHER CRITERIA-

- **Labor Needs** –

- **Curriculum Development –**

- **Pathways** –

- **Faculty Support** –

- **Recruitment Strategies** –

- **Resource Needs** –

SIGNATURE PAGE

Submitted by V. P. for
      Academic Affairs*

_____

                 Signature   Date

_____

           Printed Name   Title

Approved by the WCC Academic
      Affairs Council

_____

                 Signature   Date

_____

          Printed Name   Title

Approved by Program
      Review Committee

_____

                 Signature   Date

_____

          Printed Name   Title

*Signature by the Community College Vice President for Academic Affairs verifies that institutional curriculum approval processes have been completed and that the Community College Board of Trustees has approved this program request as per institutional policy.