|  |  |  |
| --- | --- | --- |
|  |  | |
| A round blue and white logo  Description automatically generated | **SOUTH DAKOTA BOARD OF REGENTS**  ACADEMIC AFFAIRS FORMS | |
| New Course Request | |
|  | |  |

Use this form to request a new common or unique course. Consult the system course database through for information about existing courses before submitting this form.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DSU |  | **Beacom College of Computer and Cyber Sciences** | | |
| **Institution** |  | **Division/Department** | | |
| A picture containing text  Description automatically generated | | |  | 3/5/2025 |
| **Institutional Approval Signature** | | |  | **Date** |

|  |
| --- |
|  |

**Section 1. Course Title and Description**

If the course contains a lecture and laboratory component, identify both the lecture and laboratory numbers (xxx and xxxL) and credit hours associated with each. Provide the complete description as you wish it to appear in the system course database, including pre-requisites, co-requisites, and registration restrictions.

|  |  |  |
| --- | --- | --- |
| **Prefix & No.** | **Course Title** | **Credits** |
| CSC 774 | Reverse Engineering | 3 |

*NOTE: The Enrollment Services Center assigns the short, abbreviated course title that appears on transcripts. The short title is limited to 30 characters (including spaces); meaningful but concise titles are encouraged due to space limitations in the student information system.*

|  |  |
| --- | --- |
| **Course Description** |  |
| This comprehensive course delves into advanced reverse engineering methodologies, encompassing multiple processor architectures such as x86/x64, ARM, and embedded devices. Students will gain proficiency in analyzing compiled binaries, interpreting disassembled code, and mastering Assembly language across diverse platforms. The course offers a systematic approach to reverse engineering, incorporating guided exercises in static and dynamic analysis, deobfuscation, and binary instrumentation. A key focus is on comprehending compiler optimizations, function recovery, and the security implications of software vulnerabilities. | |

*NOTE: Course descriptions are short, concise summaries that typically do not exceed 75 words. DO: Address the content of the course and write descriptions using active verbs (e.g., explore, learn, develop, etc.). DO NOT: Repeat the title of the course, layout the syllabus, use pronouns such as “we” and “you,” or rely on specialized jargon, vague phrases, or clichés.*

**Pre-requisites or Co-requisites (add lines as needed)**

|  |  |  |
| --- | --- | --- |
| **Prefix & No.** | **Course Title** | **Pre-Req/Co-Req?** |
| CSC 732 | Assembly Language | Pre-Req |
|  |  |  |

**Registration Restrictions**

|  |
| --- |
| None |

**Section 2. Review of Course**

1. **Will this be a unique or common course (*place an “X” in the appropriate box*)?**

|  |  |
| --- | --- |
|  | **Unique Course**  *If the request is for a unique course, institutions must review the common course catalog in the system course database to determine if a comparable common course already exists. List the two closest course matches in the common course catalog and provide a brief narrative explaining why the proposed course differs from those listed. If a search of the common course catalog determines an existing common course exists, complete the Authority to Offer an Existing Course Form. Courses requested without an attempt to find comparable courses will not be reviewed.* |

|  |  |  |
| --- | --- | --- |
| **Prefix & No.** | **Course Title** | **Credits** |
| CSC 428/528 | Reverse Engineering | 3 |
| CSC 844 | Advanced Reverse Engineering | 3 |
| *Provide explanation of differences between proposed course and existing system catalog courses below:* | | |
| CSC 774 and CSC 428/528 differ in both depth and focus. CSC 428/528 offers a broad overview of secure software development, introducing students to concepts such as source code auditing, fuzzing, and a basic introduction to reverse engineering and exploitation. In contrast, CSC 774 is a graduate-level, in-depth course dedicated specifically to reverse engineering, covering advanced methodologies across multiple architectures including x86/x64, ARM, and embedded systems. It emphasizes mastery of assembly, binary analysis, deobfuscation, and understanding compiler optimizations—topics only briefly touched upon in CSC 428/528. While CSC 428/528 provides foundational exposure, CSC 774 is designed for advanced students seeking specialized expertise in reverse engineering techniques and tools.  CSC 774 and CSC 844 both focus on reverse engineering but differ in scope, depth, and academic expectations. CSC 774, a master’s-level course, provides a comprehensive and structured approach to reverse engineering across multiple architectures, with guided exercises in static and dynamic analysis, deobfuscation, and binary instrumentation. It emphasizes applied skills and proficiency in analyzing binaries and understanding software vulnerabilities. CSC 844, a Ph.D.-level course, is more research-oriented and investigative in nature, placing heavier emphasis on the theoretical underpinnings of reverse engineering, mastery of assembly across architectures, and advanced manipulation techniques. While CSC 774 prepares students for applied roles, CSC 844 is designed to foster deeper inquiry, independent exploration, and potential contributions to reverse engineering research and methodology. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **CSC 428/528 – Reverse Engineering (Undergraduate and Introductory to Master’s Level)** | **CSC 774 – Reverse Engineering (Master's Level)** | **CSC 844 – Advanced Reverse Engineering (Ph.D. Level)** |
| Course Level | Undergraduate/Graduate | Graduate (Master's) | Graduate (Doctoral) |
| Primary Focus | Secure software practices with intro to reverse engineering | Applied reverse engineering techniques | In-depth, research-focused reverse engineering |
| Assembly Language | Basic introduction | Mastery across x86/x64, ARM, embedded | Advanced understanding and manipulation |
| Architectures Covered | Primarily x86/x64 | x86/x64, ARM, embedded systems | Multiple architectures with emphasis on architectural theory |
| Binary Analysis Techniques | Introductory (some fuzzing, code auditing) | Guided static/dynamic analysis, deobfuscation | Independent analysis and research-based binary manipulation |
| Security Context | Overview of vulnerabilities and exploit development | Security implications of software vulnerabilities | Advanced analysis of security flaws and implications |
| Hands-On Components | Labs and projects covering foundational tools | Extensive applied exercises in reverse engineering | Research projects, tool development, and case studies |
| Research Expectation | Low | Moderate (applied focus) | High – includes research contributions or tool evaluations |
| Intended Audience | Undergraduate and early graduate students | Graduate students in cybersecurity or related fields | Ph.D. students specializing in cyber operations or software analysis |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Common Course** | | | | *Indicate universities that are proposing this common course:* | | | | | | | | |
|  |  | | | |  | | | | | | | | |
|  |  | BHSU |  | DSU | |  | NSU |  | SDSMT |  | SDSU |  | USD |

**Section 3. Other Course Information**

1. **Are there instructional staffing impacts?**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **No**. Replacement of |  | | |
|  |  | (course prefix, course number, name of course, credits) | | |
|  |  | \*Attach course deletion form | | |
|  |  |  | | |
| Effective date of deletion: | | | Click here to enter a date. |  |

|  |  |
| --- | --- |
|  | **No**. Schedule Management, explain below:  DSU will add this course into the rotation with current and newly hired faculty with this expertise. |

|  |  |
| --- | --- |
|  | **Yes**. Specify below: |

1. **Existing program(s) in which course will be offered (i.e., any current or pending majors, minors, certificates, etc.)**:   
     
   Required in the MS in Cyber Operations and may be elective in the MS Computer Science.
2. **Proposed instructional method by university *(as defined by*** [*AAC Guideline 5.4*](https://www.sdbor.edu/administrative-offices/academics/academic-affairs-guidelines/Documents/5_Guidelines/5_4_Guideline.pdf)***)*:**

*If requesting an instructional method that is exempt from the* [Section Size Guidelines](https://www.sdbor.edu/administrative-offices/academics/academic-affairs-guidelines/Documents/5_Guidelines/5_7_Guideline.pdf)*, please provide a brief description of how the course is appropriate for the instructional method, as defined in AAC Guidelines.*

Lecture

1. **Proposed delivery method by university *(as defined by*** [*AAC Guideline 5.5*](https://www.sdbor.edu/administrative-offices/academics/academic-affairs-guidelines/Documents/5_Guidelines/5_5_Guideline.pdf)***)*:** D01 Face to Face to face D01; D15 Asynchronous; D18 Synchronous
2. **Term change will be effective**: Spring 2026
3. **Can students repeat the course for additional credit?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Yes, total credit limit: |  |  |  | No |

1. **Will grade for this course be limited to S/U (pass/fail)?**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Yes |  | No |

1. **Will section enrollment be capped?**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Yes, max per section: | 25 |  |  | No |

1. **Will this course equate (i.e., be considered the same course for degree completion) with any other unique or common courses in the common course system database?**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Yes |  | No |
| *If yes, indicate the course(s) to which the course will equate (add lines as needed):* | | | |
|  | | | |

|  |  |
| --- | --- |
| **Prefix & No.** | **Course Title** |
|  |  |

1. **Is this prefix approved for your university?**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Yes |  | No |
| *If no, provide a brief justification below:* | | | |
|  | | | |

**Section 4. Department and Course Codes (Completed by University Academic Affairs)**

|  |  |
| --- | --- |
| 1. **University Department:** | The Beacom College of Computer and Cyber Sciences |

|  |  |
| --- | --- |
| 1. **Banner Department Code:** | DCSI |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. **Proposed** [**CIP Code**](http://nces.ed.gov/ipeds/cipcode/default.aspx?y=55)**:** | 11.0701 | | | | |
|  |  | | | | |
| *Is this a new CIP code for the university?* | |  | Yes |  | No |