**MORGAN STATE UNIVERSITY**

**\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_Computer Science Department\_\_\_\_\_\_\_\_\_\_\_\_**

*Name of academic unit*

**Curriculum Committee**

PROPOSAL FOR A COURSE

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| 1. **Course Number, Title and Number of Credits:**   **Course Number: COSC xxx**  **Course Title: Quantum Cryptography**  **Number of Credit Hours: 3** |

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| **2. Number of Contact Hours:**  **Lecture: \_\_\_\_\_3\_\_\_\_\_\_\_ Laboratory \_\_\_\_\_\_0\_\_\_\_\_\_\_** |

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| 1. **Catalog Description:**   **COSC xxx Quantum Cryptography** – *Three hours of lecture, 3 credits*.  This course focuses the field of quantum communications and quantum cryptography. Topics will cover concepts necessary for implementing quantum communications systems including encryption, key distribution protocols, and post-quantum cryptographic techniques.  **Prerequisite:** COSC 323, COSC xxx Quantum Algorithms |

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| 1. **Course Objectives (Broad Objectives of the Course):**   Upon completion of this course, students will be able to do the following:   * **Describe** quantum systems and protocols for quantum communications. * **Analyze** techniques relevant to post-quantum cryptography * **Demonstrate** skills by implementing and coding quantum algorithms. |

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| 1. **Course Content (Statement of Subject Matter):**   **Unit 0:** Review of classical cryptography  **Unit 1:** Quantum random number generation  **Unit 2:** Quantum key distribution protocols I  **Unit 3:** Quantum key distribution protocols II  **Unit 4:** Post-quantum cryptography overview  **Unit 5:** Post-quantum cryptography techniques I  **Unit 6:** Post-quantum cryptography techniques II  **Unit 7**: Quantum crypto project |

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| 1. **Relationship to Curriculum Sequence (Elective or Required; Need):**   This is an elective course for the BS in Computer Science program. |

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| 1. **Relationship to Similar Course Offerings in Other Departments:**   None. |

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| 1. **Bibliography:**   Course deliverables: lectures, notes, tutorials will be provided according to the topics covered.   * Quantum Computation and Quantum Information, M.A. Nielsen and I.L.Chuang, 10th Anniversary Edition. Cambridge. ISBN-13 ‏ : ‎ 978-1107002173, 2011. * Fundamentals of Quantum Computing: Theory and Practice. Venkateswaran Kasirajan. Springer. ISBN-13: ‎ 978-3030636883, 2021.. |

**Note: A course outline and course syllabus must be submitted with this form.**

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| **Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  *Department Curriculum Chairperson Date*  **Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  *Department Chairperson Date*  **Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  *Chairperson, School Curriculum Committee Date*  **Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  *Dean/Director Date*  **Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  *Office of the Vice President for Academic Affairs Date* |