**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 (Quantum Communications Systems??)**  **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 (Quantum Communications Systems??)**     – *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, quantum information, quantum internet and quantum error correction.  **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** information measures relevant to quantum communications * **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 key distribution  **Unit 2:** Quantum information theory  **Unit 3:** Classical communications systems  **Unit 4:** Quantum communications systems  **Unit 5:** Quantum random number generation  **Unit 6:** Quantum error correction  **Unit 7:** Post-quantum cryptography  **Unit 8:** Quantum cryptography 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* |