APPROVAL FORM FOR

DEGREE PROGRAMS

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: Bagley College of Engineering **Department:** Computer Science

Contact Person: T.J. Jankun-Kelly **Mail Stop:** 9637 **E-mail:** tjk@cse.msstate.edu
Nature of Change: Modify Program **Date Initiated:** 3/23 **Effective Date:** 8/23
Current Degree Program Name:

Major: Computer Science, PhD **Concentration:**

Summary of Proposed Changes:
The required hours for MS admit PhDs were changed to better match requirements enforced by SACS.

Approved: **Date:**

Department Head — 3/3/2023

See attached page
Director of Academic Quality

Chair, College or School Curriculum Committee — 3/9/23

for Jason Keith
Dean of College or School — 3/10/2023

Chair, University Committee on Courses and Curricula

Chair, Graduate Council(if applicable)

Chair, Deans Council

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Director of Academic Quality	3/8/23
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Dean of College or School	
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1. Catalog Description

Graduate study is offered in the Department of Computer Science and Engineering leading to the degrees of Master of Science in Computer Science, Master of Science in Cyber Security and Operations, and Doctor of Philosophy in Computer Science.

The program of study of a Master of Science in Computer Science degree includes advanced courses in computer science that are selected according to the goals of the student. Masters students may choose between a professional degree General concentration or a more specialized Research concentration. The program of study of a Doctor of Philosophy (Ph.D.) in Computer Science degree includes advanced courses in computer science and significant scholarly research in computer science, presented in a dissertation. Applicants with bachelor degrees can apply for direct admission to the Ph.D. program. Applicants with master's degrees are also welcome.

The department's core research areas include the following.
- Artificial intelligence
- Computational science
- Graphics
- Human centered computing
- Software engineering
- Systems and Security

These core competencies support research applications in areas such as bioinformatics, visualization, computer security and forensics, human-computer interactions and high performance computing. Faculty, research assistants, thesis students, and dissertation students participate in a wide variety of research projects. Many research projects are multi-disciplinary or multi-specialty in nature.

2. Graduate Degree Curriculum Outline

Deletions in *italics* and additions in **bold.**

CURRENT Degree Description	PROPOSED Degree Description
Degree: Computer Science Major: PhD Concentrations: None	Degree: Computer Science Major: PhD Concentrations: None

Graduate study is offered in the Department of Computer Science and Engineering leading to the degrees of Master of Science in Computer Science, Master of Science in Cyber Security and Operations, and Doctor of Philosophy in Computer Science. <u>Masters and PhD in Computer Science</u> The program of study of a Master of Science in Computer Science degree includes advanced courses in computer science that are selected according to the goals of the student. Masters students may choose between a professional degree General concentration or a more specialized Research concentration. The program of study of a Doctor of Philosophy (Ph.D.) in Computer Science degree includes advanced courses in computer science and significant scholarly research in computer science, presented in a dissertation. The department's core research areas include the following. • Artificial intelligence • Computational science • Graphics • Human centered computing • Software engineering • Systems & Security These core competencies support research applications in areas such as bioinformatics, visualization, computer security and forensics, human-computer interactions, robotics, and high performance computing. Faculty, research assistants, thesis students, and dissertation students participate in a wide variety of research projects. Many research projects are multi-disciplinary or multi-specialty in nature. An entering PhD student with an MS degree should have a 3.50/4.00 grade point average on MS work, while a PhD student entering with only a BS degree is expected to have a 3.50/4.00 on overall undergraduate work. A student with a lower GPA may still be eligible for admission based on outstanding qualifications in other areas. A student must complete the GRE with a competitive score before admission; graduates of Mississippi State University with a 3.5 GPA do not have to take the GRE. International students require a suitable demonstration of English proficiency. Candidates for the PhD degree must have completed all prerequisite courses or their equivalent. Finally, a student must possess those qualifications and research interests that indicate to the Computer Science and Engineering Graduate Studies Committee that the applicant will be successful in the doctoral program. For additional details, consult the CS Department's Graduate Handbook.	(No Change)

CURRENT CURRICULUM OUTLINE	Required Hours	PROPOSED CURRICULUM OUTLINE	Required Hours
Core Courses The CS Core ensures students are prepared for graduate study and have a background in computer theory suitable for a graduate degree in computer science. • CSE 8011: Seminar • Two of CSE 8833: Algorithms, CSE 8813: Theory of Computation, or CSE 8843: Complexity of Sequential and Parallel Algorithms. Classes designated as theory in advance by the faculty can be used to substitute for the theory requirement on a case-by-case basis.	*3*–7	(No Change)	7
Depth Requirement Students will complete *15* hours in a research area approved by their committee. *Students with a previous MS must complete 6 hours in a research area approved by their committee.*	*6*–15	Depth Requirement Students will complete **12** hours in a research area approved by their committee. **Students without a previous MS must complete 3 additional hours in their depth requirement.**	**12**–15
Breadth Requirement Students will complete an additional *9* hours outside of their research area. These hours should be from *3* different areas. Students with a previous MS must complete an additional 3 hours from *any area.*	*3*–9	Breadth Requirement Students will complete an additional **6** hours outside of their research area. These hours should be from **2** different areas **and outside their depth area**. Students with**out** a previous MS must complete an additional 3 hours from **a different breadth area from the other breadth courses.**	**6**–9

<u>Additional Coursework</u> For direct admit students, students must complete 12 additional graduate credit hours. *No additional coursework hours are required for previous MS students.* For direct admit students, a minimum of 21 credit hours of the courses in the total program of study must be at the full graduate level (numbered 8000 or 9000). For previous MS students, 6 hours must be at the full graduate level. These totals exclude dissertation hours. Coursework outside CSE may count only at a student's committee's discretion. The majority of non-dissertation hours must come from CSE.	*0*–12	<u>Additional Coursework</u> For direct admit students, students must complete 12 additional graduate credit **graded** hours. **For MS admit students, 10 additional graduate credit hours (some mix of graded and dissertation hours) must be completed at Mississippi State (they cannot be transferred). Up to 12 hours of the Core, Depth, and Breadth may be transferred in (up to 6 hours may be transferred in the Depth area). Direct admit students may transfer Additional Coursework hours up to a total 50% of coursework hours.** **Students must take an appropriate number of 8000 level graded course hours as detailed by their Graduate Catalog and the CSE Graduate Handbook**. Coursework outside CSE may count only at a student's committee's discretion. The majority of non-dissertation hours must come from CSE.	**10**–12
<u>Dissertation Hours</u> • CSE 9000 Dissertation Research/ Dissertation in Computer Science and Engineering	20	(No Change)	20
Total Hours	*32*–63	Total Hours	**55**–63

3. Justification and Student Learning Outcomes

After the approval of the PhD in CS in 2019, it became apparent from SACS that the curriculum for PhD students with an MS admit was in violation of the MSState Catalog: A PhD program must have 24 required graded hours, 20 hours of dissertation, and 10 additional hours of either graded or dissertation hours. The CS program was defined with the assumption that most of these hours would have been completed previously during the MS, but that was not explicitly encoded nor allowed. To address this issue, the CS MS Admit PhD is now explicitly 25 required graded hours, 20 hours of dissertation, and 10 additional hours of either graded or dissertation hours with the expectation that half of the required graded coursework would be transferred in from their previous MS degree. Students that are direct admit are unchanged other than some language for clarification.

The learning outcomes are the same for our current PhD program and will not be changed:
- **Mastery of a computer-science knowledge** Students will demonstrate mastery of a computer- science body of knowledge at appropriate depth for support of research in the student's area of interest within computer science. Measured via technical competency at the Qualifying Exam, Preliminary Exam, and our Core classes.
- **Conduct and communicate advanced research** Students will demonstrate ability to conduct and communicate advanced level research that contributes to a field in computer science. Measured via publication or submission counts, presentation quality, and Dissertation Defenses.
- **Readiness for professional careers** Students will demonstrate readiness for professional careers in the field of

computing. Measured via job acceptance and classroom teaching experience.

4. Support

A letter of support from the Courses & Curriculum Committee of the Department of Computer Science and Engineering is attached.

5. Proposed 4-Letter Abbreviation

The MSU registrar has adopted CS as the abbreviation of Computer Science degrees.

6. Effective Date

Fall 2023

MISSISSIPPI STATE UNIVERSITY
JAMES WORTH BAGLEY
COLLEGE OF ENGINEERING

DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

February 27, 2023.

Dr. George Trawick, Chair
CSE Committee on Courses and Curricula
PO Box 5268
Mississippi State, MS 39762

Dr. Perkins:

On February 3, 2023, the faculty of the Computer Science and Engineering department and the Committee on Courses and Curricula reviewed and approved the change to the MS admit PHD program presented by Dr. Jankun-Kelly.

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Please feel free to contact me if there are any questions or concerns.

Sincerely,

George Trawick

George J Trawick, PhD
CSE Courses and Curricula Committee Chair
Associate Professor

Jingdao Chen, Ph.D.
CSE Courses and Curricula Committee Member
Assistant Professor

Joshua Crowson
CSE Courses and Curricula Committee Member
Instructor

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