



**SOUTH DAKOTA BOARD OF REGENTS  
ACADEMIC AFFAIRS FORMS**

**New Course Request**

**SDSU** **Jerome J. Lohr College of Engineering / McComish**  
**Institution** **Department of Electrical Engineering and Computer Science**  
Dennis D. Hedge **Division/Department** **10/22/2024**  
**Institutional Approval Signature** **Date**

**Section 1. Course Title and Description**

Prefix & No.	Course Title	Credits
CSC 485-585	AI Assisted Medical Image Processing	3

**Course Description**

This course covers the fundamentals of AI and its applications in enhancing medical image analysis and diagnosis. Students will learn about fundamentals and applications of the latest artificial intelligence technology for medical image processing. Students will have hands on experience in developing and applying AI models to process medical imaging data (e.g., X-Rays, MRIs and CT scans) and will explore use cases of AI-powered medical image processing techniques in implementing healthcare systems.

**Pre-requisites or Co-requisites**

Prefix & No.	Course Title	Pre-Req/Co-Req?
MATH 250	Introduction to Linear Algebra and Proof	Pre-Req

**Registration Restrictions**

None

**Section 2. Review of Course**

**2.1. Will this be a unique or common course?**

**Unique Course**

Prefix & No.	Course Title	Credits
CIS 378	Applied Artificial Intelligence and Applications	3
CSC 479	Applied AI	3

Provide explanation of differences between proposed course and existing system catalog courses below:

No course currently covers the fundamentals of AI and its applications in enhancing medical image analysis and diagnosis. CIS 378 covers fundamental methods of AI/Machine learning and their applications in business and organizations. CSC 479 focuses on the practical application of AI techniques to real-world problems through project-based learning. The proposed course, AI Assisted Medical Image Processing, will provide students hands on experience in developing and applying AI models to process medical imaging data and will explore use cases of AI-powered medical image processing techniques in implementing healthcare systems.

**Section 3. Other Course Information**

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

No. Schedule Management, explain below: Faculty workload will be available for this course. The course will be offered during even year semesters. Staff will alternate teaching this course and a different elective course each spring.

**3.2. Existing program(s) in which course will be offered:** Computer Science (B.S.), Computer Science (M.S.), Healthcare Systems Engineering (B.S.),

**3.3. Proposed instructional method by university (as defined by AAC Guideline 5.4):** R - Lecture

**3.4. Proposed delivery method by university (as defined by AAC Guideline 5.5):** 001 - Face to Face

**3.5. Term change will be effective:** Fall 2025

**3.6. Can students repeat the course for additional credit?**  Yes, total credit limit:  No

**3.7. Will grade for this course be limited to S/U (pass/fail)?**  Yes  No

**3.8. Will section enrollment be capped?**  Yes, max per section:  No

**3.9. 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 in Colleague and the Course Inventory Report?**  Yes  No

**3.10. Is this prefix approved for your university?**  Yes  No

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

**4.1. University Department:** Electrical Engineering and Computer Science

**4.2. Banner Department Code:** SEEC

**4.3. Proposed CIP Code:** 11.0102

Is this a new CIP code for the university?  Yes  No

### **NEW COURSE REQUEST Supporting Justification for On-Campus Review**

<u>Kwanghee Won</u> <b>Request Originator</b>	<u>Kwanghee Won</u> <b>Signature</b>	<u>Sept 18, 2024</u> <b>Date</b>
<u>Sungyong Jung</u> <b>Department Chair</b>	<u>Sungyong Jung</u> <b>Signature</b>	<u>Sept 18, 2024</u> <b>Date</b>
<u>Sanjeev Kumar</u> <b>School/College Dean</b>	<u>Sanjeev Kumar</u> <b>Signature</b>	<u>Sept 18, 2024</u> <b>Date</b>

1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.

The proposed course enhances the curriculum by integrating cutting-edge technology that improves the accuracy, speed, and efficiency of medical image analysis. It equips students with skills to reduce diagnostic errors, lower operational costs, and support personalized medicine through predictive analytics. The course also covers crucial aspects of data management and ethical considerations, ensuring students can handle large-scale medical imaging data responsibly. By fostering interdisciplinary expertise in AI, healthcare, and medical imaging, the course addresses the growing demand for professionals who can implement AI-driven innovations in healthcare systems.

2. Note whether this course is:  Required  Elective

3. In addition to the major/program in which this course is offered, what other majors/programs will be affected by this course?

None

4. If this will be a dual listed course, indicate how the distinction between the two levels will be made.

Graduate students would have additional assignments specifically reviewing published research papers and writing technical reports on projects as individuals.

5. Desired section size 20

6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).

Kwanghee Won, Associate Professor, Ph.D.

Chulwoo Pack, Assistant Professor, Ph.D.

7. Note whether adequate facilities are available and list any special equipment needed for the course.  
Facilities are adequate.

8. Note whether adequate library and media support are available for the course.

Library resources and media support are adequate.

9. Will the new course duplicate courses currently being offered on this campus?  Yes  No

10. If this course may be offered for variable credit, explain how the amount of credit at each offering is to be determined.

N/A