SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Course Request

SDSU	**Engineering / Mathematics & Statistics**
Institution	**Division/Department**
Dennis D. Hedge	9/22/2020
Institutional Approval Signature	**Date**

Section 1. Course Title and Description

Prefix & No.	Course Title	Credits
STAT 654	Machine Learning and AI for Pattern Recognition and Clustering	3

Course Description

Implementation and deployment of Machine Learning services for pattern recognition, clustering and artificial intelligence; cloud-based Machine Learning deployment; performance testing, optimization and validation of Machine Learning services.

Pre-requisites or Co-requisites

Prefix & No.	Course Title	Pre-Req/Co-Req?
(STAT 453/553 or STAT 601) OR (STAT 415/515 and STAT 684)	(Applied Bayesian Statistics or Modern Applied Statistics I) OR (R Programming and Statistical Inference I)	Pre-requisite

Registration Restrictions

None

Section 2. Review of Course

2.1. Was the course first offered as an experimental course? ☐ Yes ☒ No

2.2. Will this be a unique or common course?

☒ Unique Course

Prefix & No.	Course Title	Credits
CSC 447/557	Artificial Intelligence	3
CSC 448/548	Machine Learning	3
CSC 402/502	Mathematical Foundations of AI	3
CSC 449/549	Advanced Topics in Artificial Intelligence	3
CSC 457/557	Data Analysis, Decision Making, and Visualization	3
CSC 488/588	Pattern Recognition and Machine Learning	3
INFS 768	Predictive Analytics Decisions	3

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

As the STAT prefix, the high level statistical prerequisites, and the primary discipline of the instructor of the proposed new course suggests, the focus of this course will be on the advanced statistical aspects of machine learning and AI as applied to clustering and pattern recognition. The focus of CSC 402/502 is on the knowledge that is prerequisite to the proposed new course. The other courses mentioned above, based on their prerequisites and prefixes, focus on the computer science aspects of AI and Machine Learning. The new

course would serve as a complement to these CSC and INFS courses as opposed to duplicating them.

Section 3. Other Course Information

3.1. Are there instructional staffing impacts?

☒ No. Schedule Management, explain below: This course will be taught during the spring. The faculty member has available workload to teach this course.

3.2. Existing program(s) in which course will be offered: Statistics (M.S.), Data Science (M.S.)

3.3. Proposed instructional method by university: R - Lecture

3.4. Proposed delivery method by university: 001 – Face-to-Face Term Based Instruction; 015 - Internet Asynchronous – Term Based Instruction

3.5. Term change will be effective: Spring 2021

3.6. Can students repeat the course for additional credit? ☐Yes ☒ 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 Code: SMAS

4.2. Proposed CIP Code: 27.0501

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

NEW COURSE REQUEST
Supporting Justification for On-Campus Review

Kurt Cogswell	Kurt Cogswell	4/28/2020
Request Originator	**Signature**	**Date**
Kurt Cogswell	Kurt Cogswell	4/28/2020
Department Chair	**Signature**	**Date**
Bruce Berdanier	Bruce Berdanier	8/20/2020
School/College Dean	**Signature**	**Date**

1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.
   Artificial Intelligence and Machine Learning as applied in pattern recognition and clustering are two of the most societally significant advances in these application areas in decades. Our students need the opportunity to learn about these as part of their professional preparation.
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?
   Students in many disciplines would benefit from this course. It would be particularly beneficial for students of computer science. This course would serve as a good complement to existing computer science courses in artificial intelligence, which of course focus largely on the computer science aspects of these disciplines.
4. If this will be a dual listed course, indicate how the distinction between the two levels will be made.

N/A

5. Desired section size 30
6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).
   Cedric Neumann, Associate Professor, Ph.D.
7. Note whether adequate facilities are available and list any special equipment needed for the course.
   Adequate facilities are available. No special equipment is needed.
8. Note whether adequate library and media support are available for the course.
   Adequate library and media support are available.
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