

CNE 151: Data Science Methods for Clinicians

Faculty:

Karen A. Monsen, PhD, RN, FAAN (mons0122@umn.edu)

Lecturers:

Robin Austin, DNP, DC, RN-BC
 Chih-Lin Chi, PhD, MBA
 Connie Delaney, PhD, RN, FAAN, FACMI
 Madeleine Kerr, PhD, RN
 Martin Michalowski, PhD
 Lisiane Pruinelli, PhD, RN
 Sripriya Rajamani, MBBS, PhD, MPH
 Bonnie Westra, PhD, RN, FAAN, FACMI

Credit: This course is awarded 60 ANCC contact hours/credits.

Target Audience: Healthcare professionals interested in the quality improvement and research of healthcare through the reuse of big data.

Course Prerequisite: Healthcare professional with at least a bachelor’s degree or equivalent.

Course Description: This is an overview course with a focus on understanding new data analytic methods and application in healthcare. It does not require expertise in mathematics or statistics. The course will cover methods for reuse of big data in the context of healthcare for quality improvement and research, from an interprofessional team perspective.

Course Objectives: By the completion of the course, participants should be able to:

1. Describe methods for use of large clinical datasets.
2. Compare applicability of methods for diverse clinical problems.
3. Analyze application of methods in the context of clinical settings.

Course Content

Module	Topic	Faculty
1	Introduction to Big Data Science in Health Care	Connie Delaney, Sripriya Rajamani
2	Team Science Approach	Connie Delaney, Sripriya Rajamani
3	Data: Types, Quality and Preprocessing	Lisiane Pruinelli
4	Patient Generated Health Data, Omic Sciences, and Big Data	Robin Austin
5	Predictive Modeling and Decision Trees	Bonnie Westra, Chih-Lin Chi
6	Cluster and Discriminate Pattern Analysis	Bonnie Westra
7	Artificial Intelligence	Martin Michalowski
8	Mapping and Geographic Information Systems	Madeleine Kerr
9	Visualization: The Power of Pictures	Karen Monsen

Successful Completion Criteria:

In order for learners to be successful in completing the course, they must:

- Complete processes for registration and accessing the course.
- Actively engage in learning content.
- Complete the pre- and post-quiz.
- Complete all module activities and assessments (discussions and evaluations).
- Complete the online course evaluation.

Teaching Modalities:

This is a web-based course. Each module has specific dates for completion. Students choose the time most convenient for them to complete activities during the assigned week. During an optional phone call at a designated time, the instructor will be available to review and/or clarify the material. The call will be recorded and posted in the course for those not able to attend.

- **Voiceover PowerPoint lectures:** The key material is delivered via the internet using the Flash plug-in, which is freely available and already installed in almost all web browsers.
- **Reading assignments:** Each module contains articles that are available online.
- **Discussion activities:** Each module includes discussion activities that will cover additional material for the module topic.
- **Hands-on activities:** In most modules, there is a hand-on experience.

Textbooks and Learning Resources:

- Each module contains reading assignments.
- There is no required textbook for the course.
- This course uses several videos found on the internet.

Note: Any articles or videos included in this course are publicly available via the internet. Permission was obtained to use videos, if needed, and the articles did not require copyright permission to be included in the course.

Assignments and Activities (Required for continuing education)

- **Quizzes:** The course includes a pre- and post-quiz that must be completed. The post-quiz must be passed at 80%.
- **Module books:** For each module, learners must go through all module book content (readings, videos, etc.).
- **Discussion activities:** For each module, learners will be asked to contribute to a discussion activity.
- **Module evaluations:** For each module, learners must complete a module evaluation.
- **Course evaluation:** At the end of the course, learners must complete an overall course evaluation. Learner feedback is very important to us as we continuously improve our courses.
- **Requesting course completion documentation:** Upon completion of the course requirements, learners must notify the **UMN School of Nursing Office of Continuing Professional Development** with notice of completion and a request for an Evidence of Participation (certificate) by email at soncne@umn.edu.
- **Electronic Certificates:** Upon confirmation of receipt of the request for an Evidence of Participation, learners' course completion will be verified and a certificate will be sent via email 10 to 14 business days from the confirmation date.

Refund Policy: Refunds may be requested and issued before accessing the course. Once the Moodle course has been accessed, no refunds will be issued.

Disclosures: Please see the Disclosure Statement in the course for relevant disclosures.

Acknowledgement/Disclaimer: The School of Nursing does not endorse any of the products shown in these modules.

Learner Responsibilities:

1. Learners will review all course documents, the Welcome, Getting Started, and Disclosure.
2. Learners must complete the quizzes individually; these are not group activities. The post-quiz must be completed with an 80% pass rate. Multiple attempts are allowed.
3. Learners must complete the weekly discussions.
4. Learners should use the Q&A forum located at the top of the course for addressing any questions or concerns.
5. Learners are required to complete both module evaluations and the course evaluation to earn the Evidence of Participation (certificate) for CE contact hours.

Faculty/CPD responsibilities:

1. Faculty/CPD staff will answer the “Ask the Instructor” and “Technical Difficulties” forums and respond to questions.
2. Faculty/CPD staff will make changes in the course if there are problems in accessing resources.
3. Faculty/CPD staff will answer most questions within 48 hours on business days.

Policy on Use of Class Notes for Commercial Purposes: Learners may not distribute course notes, handouts, or other instructor-provided materials for commercial purposes, through the internet, or for any reason other than personal study among learners enrolled in the course, without the express written consent of the instructor.

Learner Privacy: In this course, our use of technology will sometimes make learners’ names and U of M Internet IDs visible within the course website, but only to instructors, or support staff. Since we are using a secure password-protected course website, this will not increase the risk of identify theft or spamming for anyone in the course. If you have concerns about the visibility of your Internet ID, please contact us for further information.

Accreditation: This course is awarded contact hours based upon the content, designed readings, activities, and assignments for each corresponding module.



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In support of improving patient care, the University of Minnesota, Interprofessional Continuing Education is jointly-accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

It is the responsibility of each participant to determine if the program meets the criteria for licensure and/or recertification for their discipline. Please check with your accrediting organization for complete requirements.