Program Change Request

**New Program Proposal**

Date Submitted: 10/03/19 11:47 am

**Viewing:** Clinical and Health Informatics

Last edit: 10/18/19 10:40 am

Changes proposed by: ada6ehh

Name of the school or college academic planner who you consulted with on this proposal:

Name: Andrea Poehling · MED

Proposal Abstract/Summary:

The UW-Madison School of Medicine and Public Health is submitting a Program Proposal to create a new 30-credit online graduate major entitled Clinical and Health Informatics (MS CHI). The major will be housed in the University of Wisconsin Institute for Clinical and Translational Research (ICTR).

The MS CHI will provide students with an interdisciplinary approach with population health, biomedical informatics, industrial systems engineering, nursing, pharmacy, and healthcare operations management expertise. Graduates will possess a strong foundation in healthcare decision making using informatics methods to create innovative solutions or improve current practices in health policy, clinical practice, security, and biomedical and health information systems.

The MS CHI will serve working professionals in the healthcare industry through a fully online curriculum. The program seeks to become Wisconsin's first master's program accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). The program will be comprised of 30 credits, which will include a 30-credit, collaborative coursework with working professionals. Students are expected to have 3-5 years of clinical or information technology-related work experience, preferably in a health care setting, and should have a statistics background. The MS CHI will meet the growing demand for clinical and health informatics professionals who will contribute to the quality and delivery of healthcare.

**Basic Information**

- **Type of Program:** Degree/Major
  - UW System approval and approved NOF C&Hi 5.10.2019.pdf

- **Upload completed draft of the full Board of Regents Authorization Proposal for this program.**
  - 131 Programs Modal MS CHI 20191003.xlsx
  - MS CHI Cost and Revenue Projections Narrative.docx
  - UW Madison 130 MS CHI New Program Authorization 105 2019.docx

**Who is the audience?**

- Graduate or professional

**Home Department:** Clinical & Translational Resarch (ICTR)

**School/College:** School of Medicine and Public Health

The program will be governed by the home department/academic unit as specified. Will an additional coordinating or oversight committee be established for the program?

No

Is this in the Graduate School? Yes

**Award:** Master of Science

**SIS Code:**

**SIS Description:**

**Transcript Title:** Clinical and Health Informatics

**Named Options:**
Will this be offered as an additional major as well?  No
Is this a non-admitting master's degree?  No

Roles by Responsibility: List one person for each role in the drop down list. Use the green + to create additional boxes.

<table>
<thead>
<tr>
<th>Role Type</th>
<th>Name (Last, First)</th>
<th>Email</th>
<th>Phone</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Director</td>
<td>Burnside, Elizabeth S</td>
<td><a href="mailto:eburnside@wisc.edu">eburnside@wisc.edu</a></td>
<td>608/265-4099</td>
<td>Deputy Executive Director, Institute for Clinical and Translational Research</td>
</tr>
<tr>
<td>Primary Dean’s Office Contact</td>
<td>Poehlking, Andrea D</td>
<td><a href="mailto:adpoehlking@wisc.edu">adpoehlking@wisc.edu</a></td>
<td>608/262-2628</td>
<td>Dean’s Office Academic Planning</td>
</tr>
<tr>
<td>Primary Contact</td>
<td>Fontaine, Sherry Joanne</td>
<td><a href="mailto:sffontaine@wisc.edu">sffontaine@wisc.edu</a></td>
<td>608/890-3680</td>
<td>ICTR Clinical and Health Informatics Master’s Degree Program Director</td>
</tr>
<tr>
<td>Department Chair</td>
<td>Brasier, Allan R</td>
<td><a href="mailto:abrasier@wisc.edu">abrasier@wisc.edu</a></td>
<td>608/263-7371</td>
<td></td>
</tr>
</tbody>
</table>

List the departments that have a vested interest in this proposal:

- Biostatistics and Medical Info (BMI)
- Industrial and Systems Engr (IND SY EGR)
- School of Nursing (NURSING)
- Population Health Sciences (POPHLTH)
- School of Business (BUSINESS)
- School of Pharmacy (PHARMACY)

Are all program reviews in the home academic unit up to date?  Yes
Are all assessment plans in the home academic unit up to date?  Yes
Are all assessment reports in the home academic unit up to date?  Yes

Mode of Delivery: Distance Education (100% online)

Provide information on how any lab courses required for the degree will be handled.

Are there any lab courses required for this degree?  No

Will this program be part of a consortial or collaborative arrangement with another college or university?  No

Will instruction take place at a location geographically separate from LW Madison?  No

Will this program have outside accreditation?  Yes

Guide Accreditation tab

The program will apply for accreditation in Spring 2023: Commission on Accreditation for Health Informatics and Information Management Education

Will graduates of this program seek licensure or certification after graduation?  No

First term of student enrollment: Fall 2020 (1212)

When will the application for the first term of enrollment open? Spring 2020 (1204)

Which terms will you allow new students to enroll? What are the application deadlines for each term selected?

<table>
<thead>
<tr>
<th>Start Term</th>
<th>Application Deadline MM/DD</th>
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</thead>
<tbody>
<tr>
<td>Fall</td>
<td>07/01</td>
</tr>
</tbody>
</table>

Year of three year check-in to GEC (3 years after first student enrollment): 2024

Year of first program review (5 years after first student enrollment): 2026

If this proposal is approved, describe the implementation plan and timeline:

A cross-campus curriculum planning committee has been meeting an ongoing basis since Spring 2018. A Program Director serves as lead for accreditation and other matters; appointing a steering committee; and forming an advisory committee. We will begin marketing the degree for Fall 2020 admission in consultation with the Division of Continuing Studies (DCS) as soon as permitted. Recruitment efforts will include virtual events (e.g. webinars) and events with industry partners in the region. In Fall 2019, we will begin supporting faculty to work with instructional designers to transition courses to an online format. In early 2020, we will ensure that a high-quality cohort is admitted and enrolled. In Spring 2020, we will train faculty/staff on their role as advisors. We will continue to keep all campus stakeholders informed of the marketing and recruitment strategies as we work with the Advance Your Career team on a national recruitment campaign with social media, and Google ad words. Instructors will be supported by an instructional designer when their course is taught the first two times to ensure that technical and pedagogical support is ongoing for all faculty instructors. The first cohort of students is expected to begin their minor in Fall 2021. We will keep you informed on the
Rationale and Justifications

Why is the program being proposed? What is its purpose?

The program will serve working professionals in the healthcare industry through a fully online curriculum and will become Wisconsin’s first Master’s program accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). The program collaborates with the Schools of Medicine and Public Health, Nursing, Pharmacy, and Business, and the College of Engineering. This interdisciplinary approach is essential to providing the expertise from population health, biomedical informatics, industrial systems engineering, nursing, pharmacy, and healthcare operations management needed to provide clinicians, nurses, pharmacists, researchers, administrators and information technology with the tools and methods to assess the effect of health innovations on policy, clinical practice, security, and biomedical and health information systems.

What is its relation to the institution’s mission? (Consider the mission broadly as a major research university with missions in teaching, research, service, and the Wisconsin Idea.) How does it contribute to the mission of the sponsoring unit(s)?

The Institute for Clinical and Translational Research (ICTR), where this program will be housed, is interdisciplinary (interdepartmental) in design. ICTR is housed within the School of Medicine and Public Health (SMPH) and partners closely with the Schools of Nursing, Veterinary Medicine, Pharmacy, and the College of Engineering. The overarching mission of MS-CHI is to offer ICTR members and partners throughout the entire institution, as well as external professionals in the region, the knowledge and skills to translate best practices in applied clinical informatics to improve clinical care. This program is poised to be a leader in clinical and health informatics with a proven record of advancing research to applied outcomes to improve health in the United States. This program will utilize the expertise of faculty across the university to fill a growing need to leverage informatics expertise in the healthcare space where evidence-based, data-informed care is essential. Students will graduate from MS-CHI with skills to enhance their professional practices in the clinical healthcare setting and as business and informatics leaders; drawing from operational and healthcare management, health informatics, and information technology skills to solve complex problems of the social-behavioral aspects of health. This new degree is part of SMPH’s strategic vision and plan, creating vital connections between basic discovery and clinical/translational research, and providing programs that support the health and wellness of individuals and populations.

This program also supports the UW-Madison campus strategic framework goal to “improve access (through online delivery) and build innovative professional master’s-level degrees and other lifelong learning experiences.”

Do current students need or want the program? Provide evidence.

The MS-CHI will serve an audience outside of the traditional school structure, offering all courses online and providing the flexibility of completing the program on a part-time basis. Prospective students will include healthcare professionals and information technology professionals with a strong interest and/or background in healthcare informatics, data analytics, clinical care or research, and health information technology. Trends in academic programs for non-traditional students at University of Wisconsin-Madison demonstrate the demand for degree-granting programs for this student population with continual increases in the number of programs, enrollment, and student credit hours from 2009-2018. Similarly, distance education course enrollments for graduate and clinical degrees increased by 46.6% over the same period.

Market research conducted by the Division of Continuing Studies (DCS) determined that there was a strong demand for an online professional master’s degree in the field of clinical and health informatics. The fact that the MS-CHI program will prioritize CAHIIM accreditation will be a significant differentiator among similar degrees. DCS also determined that given the labor demand for individuals with graduate training in clinical and health informatics, students are willing to pay the $1600 per credit for this degree and prefer the flexibility of an online degree modality while working and attending the degree as a part-time student.

What is the market, workforce, and industry need for this program? Provide evidence.

The 2017 Leadership and Workforce study conducted by the Mackinac Research arm of the HIMSS found that 61% of healthcare organizations and vendors are expecting to increase hiring in the upcoming few years. Epic, a Wisconsin-based company, now works with over 50 IT vendors seeking health informatics specialists in over 20 states. In Wisconsin alone that year, more than 900 job postings were looking for people with 3-5 years of clinical experience and a master’s in a data field. Additionally, information technology and healthcare clinical informatics is a growing field with more than 900 job postings in Wisconsin alone looking for a person with 3 to 5 years of clinical experience and a master’s in data analytics. Local employers include Deloitte, General Electric, Vital Health solutions, UW Health and Epic. According to the Department of Labor and Bureau of Labor Statistics, healthcare will produce more new IT jobs through 2022 than any other industry, with a projected increase of 23%.

Because of these growing trends and opportunities in healthcare and informatics, many major universities are creating program offerings and certificates. The University of Illinois at Chicago has recently created a Master of Science in Health Informatics and a Post-Master’s Certificate in...
Health Informatics. Other institutions with health informatics programming include University of Cincinnati, Northwestern University Feinberg School of Medicine, Johns Hopkins University, University of Texas, and the University of Washington School of Nursing and School of Medicine.

Expertise in clinical and health informatics is also required in the pool of job openings that involve electronic health record analysis, database design and clinical operational management, health modeling, and health care data security. AMIA reports that the average salary among all its members is $131,374. The market demand according to the Educational Advisory Board Report on Health Professions saw a national demand of over 35,000 job postings in 2016 asking for the informatics skills. Moreover, healthcare has even greater data integration, system interoperability, and reporting needs than ever before and healthcare clinical informatics skills are required to demonstrate outcomes for Medicare reimbursement and reform. The demand for these skills is driving new online programming across the country. UW Madison is poised to become a leader in this space. Within the Integrated School of Medicine and Public Health, ICTR is the home to the Clinical and Health Informatics Institute (CHII), which is designed to foster applied clinical health informatics activities. ICTR provides links to the Schools of Nursing, Veterinary Medicine, and Pharmacy, the College of Engineering and Department of Biostatistics and Medical Informatics. The timing is right as health care employers are actively seeking analytics in informaticists with a 37% increase in informatics job postings and data analytics skills from 2013-2016. The overall projected growth in the healthcare analytics market from 2015-2020 is over 11 billion with four out five hospital systems citing value-base care as a key analytical driver. The need for data skills are increasingly becoming a necessity in the healthcare industry.

Locally, there are several potential employers for program graduates. Local employers include Deloitte, General Electric, VitalTech Solutions, UW Health, and Epic. Recent job titles for careers in clinical healthcare informatics include Medical Informatics Project Directors, Researchers, Systems Analysts, Clinical Informatics Directors, Specialists, Coordinators, and Analysts. Conversations between Epic staff and MS CHI development team members indicated that there was interest in the online MS CHI. Epic staff suggested the degree would be a good fit for employees that need to work in a clinical setting, leadership teams that use health informatics for decision-making, and technical service teams that provide customer support.

The University of Wisconsin Madison will leverage the institution’s cutting-edge work in the School of Medicine and Public Health, where medical and population health research already have a strong record in informing best practices in the clinical setting to develop and offer a MS in Clinical and Health Informatics that will meet the growing demand for clinical and health informatics professionals who will contribute to the quality and delivery of healthcare.

How does the program represent emerging knowledge, or new directions in professions and disciplines?

There is a growing need for a clinical healthcare focus for leaders and managers to use informatics to solve complex healthcare problems. This is part of the SMPHS strategic vision and planning mission to create vital connections between basic discovery and clinical/translational research. The overarching goal for MS CHI is to create strategic programming and research partnerships that improve public health through translating basic research discoveries into direct, practical improvements in clinical care and healthcare delivery systems.

The program learning outcomes are based on American Medical Informatics Association (AMIA) Health Informatics Core Competencies for CAHIM accreditation. This program will seek accreditation to support the mission and vision of the next generation of informatics professionals. Accreditation is a key differentiator for our program and leverages key expertise across disciplines and expertise across faculty departments to leverage all 10 competencies in a degree program that spans expertise in data management, interprofessional practice, and data design, systems and operational management across healthcare fields.

In what ways will the program prepare students through diverse elements in the curriculum for an integrated and multicultural society (may include diversity issues in the curriculum or other approaches)?

The MS CHI advances curriculum excellence to promote diversity and equity in the following ways:

1. Disease prevention efforts as well as access to care in our nation’s hospitals and clinics can vary greatly in different populations groups; resulting in health disparities that impact the health status of vulnerable populations. The MS CHI curriculum poses several questions across courses to critically analyze why outcomes vary so greatly by socio-economic, race, ethnicity and gender, education, age and other social determinants.

2. Data driven health care will examine patient care across a variety of variables to analyze cost-effective measures to improve data driven decision-making to support the equitable distribution of resources.

3. Across the curriculum, social determinants of health and patient-generated data are used to analyze complex problems, support integrative solutions, and design and implement health informatics solutions across healthcare institutions and patient populations.

4. Human factors engineering skills are developed to support better understanding of the interaction between users and information technology so that organizational, social, and physical contexts are principles of good design and implementation.

5. Ethical and professional conduct are critical components of the MS CHI and to highlight the necessity to protect biomedical and health information across all users.

The MS CHI focuses on the professional and ethical conduct, leadership development, interprofessional teamwork, and organizational decision making skills that ensure the ethical use of data to support the health outcomes of all people across the lifespans.
The MS-CHI will actively pursue equity in student recruitment, access, and retention by working closely with the Graduate School and the Division of Continuing Studies marketing and recruitment teams to make sure students who represent all forms of diversity including socio-economic, gender, sexuality, race, ethnicity and religion are recruited. Marketing materials and content will show a diverse student body. Graduating students will share insights about the program with interviews, videos, and testimonials about their program experience working in interdisciplinary collaborative teams to solve real healthcare problems and interact with professionals who have varied experience and backgrounds.

By offering flexible schedules and removing geographic boundaries, online graduate and professional programs, such as the MS CHI program, increase access for non-traditional learners. The MS-CHI program is targeted to working professionals that represent a range geographic areas, experiences, and backgrounds; adding to the richness and overall diversity of the student population as well as the student experience.

As a degree that promotes public health, recruiting students who represent the diverse needs in healthcare delivery, data driven medicine and data informatics is the goal. Efforts will be made to develop relationships at conferences, networking events, and clinical settings that support the diversity efforts and goals of the program. Moreover, once the program has program revenue resources, scholarships targeted at underrepresented groups will be awarded to promote gaps within the diversity and equity goals of the program.

Academic support is essential for the retention and success of all students. Academic support services for the MS-CHI program will be designed to meet the needs of a diverse, adult student population. The Academic Director and Student Services Coordinator will be the primary contacts for all students and will help support advising as well as both academic and career resources for all learners. An online Community of Practice will provide program resources, tutoring support, peer to peer sharing, and goal setting strategies for career success. The Community of Practice will offer an inclusive, virtual environment where students from diverse backgrounds will interact and build a community of learners around common academic and professional interests. These can be shared openly with all students enrolled in the program.

Webinars targeting stress, work life balance, career exploration, and effective time management and organization will be shared along with UW resources that can support and guide professional development. All students will have a faculty mentor in the program to guide and support individualized needs and goals.

What gap in the program are you intend to fill?
There are a number of programs offered at UW-Madison and within the University of Wisconsin system that offer related content but do not have a CAHIIM accredited, online program for adult learners; aspects of the MS-CHI program which differentiate it from related programs.

Within the University of Wisconsin-Madison, the SMPH offers an M.S. in Biomedical Data Science. This program prepares graduates to understand key concepts and methodologies from computer sciences and statistics to contribute to the solutions central to computational problems in biomedicine. This program is face-to-face and is for students interested in data structures and algorithms with a strong attitude for math and computer science. The program is research- and thesis-based and designed for students interested in building algorithms and simulations for population health research, statistical genetics, and biomedical informatics.

Additionally, the M.S. in Statistics named option in Biostatistics at UW Madison serves students who work in the theory, methodology, and application of statistics. This program focuses primarily on the statistics of biomedical sciences and differs from informatics in that is focused on the computation and mathematical application of how to design experiments and survey samples in the biomedical field.

Informatics, in contrast to biomedical data science and statistics, is focused on the interaction between humans and information. Informatics, as a field, is a branch of information engineering and is about information systems and how they interface with organizations, technologies, and systems and includes statistics as a subfield. However, informatics as a whole is much more inclusive to the study of the social aspects of how information technologies are applied in the healthcare space. A strategic priority for the program MS-CHI is accreditation from CAHIIM, which incorporates the AMIA accreditation standards for master’s degree programs in health informatics. In addition, all courses are offered online for working healthcare professionals and are focused primarily on the application and applied tools used in a clinical or healthcare setting. MS-CHI does not offer a thesis option and works with the applied skills needed to translate data science into workable processes at the healthcare system level.

### Faculty and Staff Resources

List the core program faculty and staff with title and departmental affiliation(s) who are primarily involved and will participate in the delivery and oversight.

<table>
<thead>
<tr>
<th>Name (Last, First)</th>
<th>Department</th>
<th>Title</th>
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<tbody>
<tr>
<td>Pinelesnstein, Barbara J</td>
<td>School of Nursing (NURSING)</td>
<td>DNS, RN, BC, FAAN, Clinical Professor, Richard E. Sunialko Professor in Health Care Leadership</td>
</tr>
<tr>
<td>Werner, Nicole E</td>
<td>Industrial and Systems Engr (IND SY EGR)</td>
<td>PhD, Harvey D. Spangler Assistant Professor</td>
</tr>
<tr>
<td>Temple, Jack D</td>
<td>School of Pharmacy (PHARMACY)</td>
<td>PharmD, MS, Director, Pharmacy Business Services and Informatics</td>
</tr>
</tbody>
</table>

https://next-guide.wisc.edu/courseleaf/approve?role=GRAD SCH Dept Approver
What resources are available to support faculty, staff, labs, equipment, etc.? 

Sherry Fontaine was hired as a full-time program director on May 1, 2019. A student services director has been assigned and other ICTR-affiliated staff are available to support and mentor students. All faculty will be supported to teach online through the TeachOnline@UW program and through individual buyout and support from instructional designers.

Program advisor(s) with title and departmental affiliation(s).

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<tr>
<th>Name (Last, First)</th>
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<tbody>
<tr>
<td>Meyerand, Mary Elizabeth</td>
<td>Medical Physics (MED PHYS)</td>
<td>Professor School of Medicine and Public Health and Professor of Medical Physics and Co-Director of the Women in Science and Engineering Leadership Institute</td>
</tr>
<tr>
<td>Burnside, Elizabeth S</td>
<td>Clinical &amp; Translational Research (ICTR)</td>
<td>MD, MPH, MS, Professor, Radiology, Associate Dean of Team Science and Interdisciplinary Research, Deputy Executive Director for the Institute for Clinical and Translational Research</td>
</tr>
<tr>
<td>Steege, Linsey M</td>
<td>School of Nursing (NURSING)</td>
<td>PhD, Associate Professor and Gulbransen Chair in Health Informatics &amp; Systems Innovation</td>
</tr>
<tr>
<td>Pinehelson, Barbara J</td>
<td>School of Nursing (NURSING)</td>
<td>DN, RN-BC, FAAN, Clinical Professor, Richard E. Sainio Professor in Health Care Leadership</td>
</tr>
<tr>
<td>Siemens, Enno</td>
<td>School of Business (BUSINESS)</td>
<td>Associate Dean MBA and Masters Programs and Professor of</td>
</tr>
<tr>
<td>Burton, Eric C</td>
<td>School of Pharmacy (PHARMACY)</td>
<td>Division Chair, Clinical Associate Professor</td>
</tr>
<tr>
<td>Smith, Maureen A</td>
<td>Population Health Sciences (POP HTH)</td>
<td>MPH, PhD, Professor, Departments of Population Health Sciences and Family Medicine</td>
</tr>
<tr>
<td>Newton, Michael A</td>
<td>Biostatistics and Medical Info (B M I)</td>
<td>PhD, Professor, Interim Chair for the Department of Biostatistics and Medical Informatics</td>
</tr>
</tbody>
</table>

Describe how student services and advising will be supported.

The academic director and the lead student services coordinator will be the first line of contact for students. Additional student services coordinators will be added as the program grows, and support from the existing ICTR student services team is also planned for certain service functions. Faculty members of the steering committee will be the primary responsible members of the academic advising team for this program. This team will also provide support to the program director for the planning of professional development, career planning and employer relations. The program will employ a career services coordinator by year 3 to focus on career development in a full-time capacity.

The Division of Continuing Studies Integrated Marketing & Communications team (IMC) and the program's steering committee will work together with program staff on recruitment and admissions procedures. Once a student is admitted, program staff will work closely to support the MIS-CHI students. Program staff will lead admissions operations; ensure compliance with policies and procedures; provide student services, including provide academic guidance and career/leadership development; manage employer relations; and provide data reporting and rankings management.

Programmatic services, including connections to web and guide information and the Registrar's Office, will be the responsibility of program staff. Professional development opportunities will be primarily provided through online webinars and career exploration examples in an online Community of Practice.

An online Community of Practice will provide program resources, tutoring support, peer to peer sharing, and goal setting strategies for career success. The Community of Practice will offer an inclusive, virtual environment where students from diverse backgrounds will interact and build a community of learners around common academic and professional interests. These can be shared openly with all students enrolled in the program. Webinars targeting stress, worklife balance, career exploration, and effective time management and organization will be shared along with UW resources that can support and guide professional development. All students will have a faculty mentor in the program to guide and support individualized needs and goals.

Confirm that the program advisor(s) or coordinator(s) have been consulted and reviewed this proposal.

Yes
Resources, Budget, and Finance

Is this a revenue program? Yes
What is the tuition structure for this program?
   Online/Distance per credit tuition
Select a tuition increment: $1,600/credit
What is the rationale for selecting this tuition increment?
   Based on a competitive market study completed by the Division of Continuing Studies, this market-based tuition is in line with other institutions hosting similar programs at peer universities. The labor demand also suggests students are willing to pay for this degree and prefer the flexibility of an online degree modality while working and attending to the degree as a part-time student.
Will segregated fees be charged?
   No
If segregated fees will be charged, please explain.
   This is a fully online program and will not need campus services typical for residential learners.

Provide a summary business plan.
This program is expected to be self-funded through tuition revenue within 3 years of implementation.
Enrollment will begin with 25 students and increase with additional cohorts of 25 students per year until a goal of 75 new students is reached in Year 4 after launch. The program will also request an online per credit tuition tier based on the competitive space for this discipline.
Funding for program development is supported by ICTR, the Division of Continuing Studies, and central campus. The program has MOUs stating that participating departments are fully aware of their role in providing courses, having faculty trained in online teaching and the budget resources are prepared to support faculty buy-out and teaching in participating departments.
Funding from the Division of Continuing Studies also includes market research and analysis, including a market demand study, competitive survey and plans to build out marketing strategy and execution plans for program launch in Fall 2020. The DCS Recruitment Team will create and implement program-specific recruiting plans and support development of websites and other communication materials.

Provide an overview of plans for funding the program including but not limited to program administration, instructional/curricular delivery, technology needs and program assessment.
This program is expected to be self-funded through tuition revenue within 3 years of implementation.
Enrollment will begin with 25 students and increase with additional cohorts of 25 students per year until a goal of 75 new students is reached in Year 4 after launch. The program will also request an online per credit tuition tier based on the competitive space for this discipline based on a competitive analysis of similar programs at peer institutions.
Tuition revenue will be gathered centrally at the School of Medicine and Public Health where it will be redistributed to the program partners and used directly for program administrative support.
With respect to instruction, Memorandums of Understanding (MOUs) are in place with all program partners to assess instructional activity at $600/credit hour per student. The terms of these MOUs are re-assessed every 1.5 years. Therefore, all program partners are compensated by the program for instruction based on total credit hours of each course.
With respect to excess program revenue, the ICTR steering committee will direct allocation among the program partners, and/or invest back into the program, and/or hold in a contingency fund for future needs. Potential partner uses for the revenue include support for additional faculty lines, professional development, and pilot funding for grants.
Program administration will be housed in ICTR. Tuition revenue will directly support relevant staff including the administrative program director, the academic director, graduate student services coordinator, career services staff and administrative support. Other direct expenses are new course development, marketing and recruitment.
The Division of Continuing Studies will support program assessment through targeted student surveys at key times in the program. The surveys will identify program deficiencies, which feed planning session decisions on program improvement.

What is the marketing plan?
Marketing efforts will be led by the Division of Continuing Studies Integrated Marketing & Communications (IMC) team. IMC will develop a comprehensive learner-centric marketing strategy to build awareness of the program and generate leads.
Specific digital marketing efforts employed will likely include paid search (Google AdWords), paid social (Instagram, Snapchat) and digital display web banners. Email marketing will also be utilized by targeting specific clinical health professionals and alumni as well as targeted paid lists such as GRE (Graduate Record Exam), GMAT (Graduate Management Admission Test), hospitals, and local industry. Dedicated landing page(s) will be built using lead conversion best practices.
In the marketing phase (July 2019 – April 2020), the IMC marketing team will develop and implement a marketing plan, identify target audiences and key messages, develop landing page content, and build a marketing campaign with supporting creative materials. With a targeted campaign launch of July 2019, the marketing campaign will run for six months prior to the Spring 2020 application deadline. The IMC
marketing team will continue to monitor performance and optimize the campaign for improved results.

Describe resource and fiscal considerations - A. Provide an overview of plans for funding the program including program administration, instructional/curricular delivery, academic and career advising, technology needs, marketing (if relevant), financial aid and scholarships (if relevant), capacity for student learning outcomes assessment, and program review.

Funding for program development is supported by ICTR, the Division of Continuing Studies, and central campus. Memorandums of Understanding (MOU) for participating schools and colleges to share tuition revenue with participating departments and instructors are secured.

Funding from the Division of Continuing Studies also includes market research and analysis, including a market demand study, competitive survey and plans to build out marketing strategy and execution plans for programs launch in Fall of 2020. The DOS Recruitment Team will create and implement program-specific recruiting plans, and support development of websites and other communication materials.

Student learning outcomes are aligned with the accreditation goals of the degree and have already been mapped accordingly. The student learning assessment has been reviewed by the ICTR curriculum committee and approved. Due to the accreditation goals of the program this program has been mapped to meet high level competencies and all faculty involved are aware of the accreditation standards and the role their course plays in the assessment mapping of the degree overall.

Describe resource and fiscal considerations - B. Are the faculty, instructional staff and key personnel existing or new faculty and staff? If they already serve existing programs, how are they able to add this workload? If new faculty and staff will be added, how will they be funded?

For programs start-up (1-3) years, most faculty and staff are existing. Much of the early curriculum will make use of existing courses across all the program partners with two new courses being created to support the degree. All courses have been reviewed as part of the degree mapping for accreditation and map to the AMIA (American Medical Informatics Association). All except two courses in the degree will need full engagement for online course development and instruction design support.

Adding students to these existing courses to serve an online audience is the biggest early cost to provide online resources and buy out of time. Instructional compensation ($600/credit) will assist with growth and online scaling. A new program director is being hired for the program to teach the capstone and to work with faculty across campus to leverage relationships and networks needed for this degree to be successful.

For early program years (3-4), academic capacity will be added through increased instructional appointments and the hiring of teaching assistants. A career services staff member will be hired directly as part of administrative staff growth. All of these actions are funded through tuition revenue.

For longer-term program operation (5+ years) with sustained high enrollment (300+ students/year), the hiring of additional dedicated instructional staff and dedicated support staff will be undertaken. Exact needs will be determined based on student demand for academic topics or program services. Program tuition revenue will be used to fund new hires.

Describe resource and fiscal considerations - C. What impacts will the program have on staffing needs beyond the immediate program? How are those needs being met?

The budget model provides ICTR and participating departments with adequate fiscal resources to develop services and courses to teach online sections without impact on existing programs.

Describe resource and fiscal considerations - D. For graduate programs, describe plans for funding students including but not limited to funding sources and how funding decisions will be made.

The students in this program will primarily self-funded, often with employer reimbursement. The program steering committee will determine use of and award scholarships for underrepresented groups to attract diverse candidates once the program is self-sustaining.

LW System Administration and the Board of Regents require submission of budget information in a specific format. These forms will be completed, submitted to governmental agencies and before submission to UWSC for Board consideration. These forms are uploaded here by APIR.

Does the program or change require substantial new resources other than those just described? Describe the need. Confirm that the dean is committed to providing the resources.

The program requires substantial development funding. ICTR has received funding from the Division of Continuing Studies and campus to support this period of development.

Are new Library resources needed to support this program?

No

Describe plans for funding students including but not limited to funding sources and how funding decisions are made.

## Curriculum and Requirements

Guide Admissions / How to Get In Tab

Approved Shared Content from /shared/graduate-school-admissions/

Last Approved: Oct 16, 2019 6:46pm

Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two step process between academic programs and the Graduate School. **Applicants must meet the minimum requirements of the Graduate School as well as the program(s).** Once you have researched the graduate program(s) you are interested in, see your advisor.

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>July 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>This program does not admit in spring.</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>This program does not admit in summer.</td>
</tr>
</tbody>
</table>

**Graduate Admissions Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>APIR Graduate Marian游泳</td>
<td>Not required</td>
</tr>
</tbody>
</table>

https://next-guide.wisc.edu/courseleaf/approve/?role=GRAD SCH Dept. Approver
Program admission

The faculty executive committee for the program considers all aspects of each application. The applicant must meet the minimum requirements of the Graduate School plus those of the program, listed here:

- Have a focused area of interest in informatics, data analytics, clinical care or research, health information technology or similar fields.

Ideally have a health professional degree or bachelor's degree in information technology, statistics, computer science or similar field.

- Have completed a college level statistics course or equivalent work experience.

Describe plans for recruiting students to this program.

- Working in concert with the Division of Continuing Studies, we plan to:
  - Create pop-up events and lunch and learn at targeted universities and businesses (in this case, UW-Madison is the only visiting institution, so this would be a more intimate event with a presentation).
  - Host a series of events on UW-Madison campus targeting UW-Madison students in healthcare (Undergraduate future professionals for a long strategy recruitment) and professionals working in healthcare within the community at evening events. (Examples might include: tips for your application, online learning degree, meeting faculty and having a chance to see career outlook).
  - Work with Clinical and Health Informatics program staff to host booths at targeted conferences and career fairs to reach working professionals.
  - Call all leads within 24 hours of RFI (request for information) form submission including video conferencing as requested to answer questions.
  - One to one email and texting with prospective students to answer questions and connect to program staff as appropriate.
  - Develop automated campaigns to move prospective students from 1) being interested and wanting to learn more to 2) starting the application to 3) finally completing the application.
  - Develop automated yield campaigns and strategies to get accepted students to enroll.
  - Coordinate many of the above marketing activities in conjunction with partner departments (e.g., partners take program brochures to conferences they attend).

What is the recruiting and admissions strategy for underrepresented students?

The MS-CHI will actively pursue equity in student recruitment, access, and retention by working closely with the Graduate School and the Division of Continuing Studies marketing and recruitment teams to make sure students who represent all forms of diversity including socio-economic, gender, sexuality, race, ethnicity and religion are recruited. Marketing materials and content will show a diverse student body. Graduating students will share insights about the program with interview, videos, and testimonials about their program experience working in interprofessional collaborative teams to solve real health care problems and interact with professionals who have varied experience and backgrounds.

By offering flexible schedules and removing geographic boundaries, online graduate and professional programs, such as the MS CHI program, increase access for non-traditional learners. The MS-CHI program is targeted to working professionals that represent a range geographic areas, experiences, and backgrounds; adding to the richness and overall diversity of the student population as well as the student experience.

As a degree that promotes public health, recruiting students who represent the diverse needs in healthcare delivery, data driven medicine and data informatics is the goal. Efforts will be made to develop relationships at conferences, networking events, and clinical settings that support the diversity efforts and goals of the program. Moreover, once the program has program revenue resources, scholarships targeted at underrepresented groups will be awarded to promote gaps within the diversity and equity goals of the program.

Academic support is essential for the retention and success of all students. Academic support services for the MS-CHI program will be designed to meet the needs of a diverse, adult student population. The Academic Director and Student Services Coordinator will be the primary contacts for all students and will help support advising as well as both academic and career resources for all learners. An online Community of Practice will provide program resources, tutoring support, peer to peer sharing, and goal setting strategies for career success. The Community of Practice will offer an inclusive, virtual environment where students from diverse backgrounds will interact and build a community of learners around common academics and professional interests. These can be shared openly with all students enrolled in the program.

Webinars targeting stress, work life balance, career exploration, and effective time management and organization will be shared along with UW resources that can support and guide professional development.

All students will have a faculty mentor in the program to guide and support individualized needs and goals.

Projected Annual Enrollment:

<table>
<thead>
<tr>
<th>Year</th>
<th>Projected Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>25</td>
</tr>
<tr>
<td>Year 2</td>
<td>71</td>
</tr>
<tr>
<td>Year 3</td>
<td>104</td>
</tr>
<tr>
<td>Year 4</td>
<td>139</td>
</tr>
<tr>
<td>Year 5</td>
<td>162</td>
</tr>
</tbody>
</table>

Maximum enrollment that can be supported with existing instructional and student services resources: 50

Describe plans for supporting enrollments that are much higher or much lower than the anticipated enrollment.

In the event of low enrollment, efforts to expand administrative resources will be curtailed and instructional expenses will decrease as they are limited to student enrollment through the $/credit instructional support. However, student support expenses will be allocated in accordance with student needs.

https://next-guide.wisc.edu/courseleaf/approve/?role=GRAD SCH Dept Approver
Higher-than-expected enrollment is less likely, as student enrollment numbers can be controlled through the admissions process. However, if this were to occur, expanding instructional resources will be a first priority. New courses will be created for required courses and any high-demand courses. Higher enrollment will produce high tuition revenue, and this would be applied to increasing existing instructor appointments and/or hiring additional teaching assistants, and/or tapping private sector instructional expertise, and/or one-time faculty overload requests. Staff capacity can be rapidly increased through use of student hourly workers, overload requests and overtime depending on employee labor classification. If the high enrollment levels continue, additional instructional and administrative staff will need to be hired.

Those who are not familiar with using the html editor fields may upload a document with information about the curriculum for use by those who will format and edit the content that will appear in the Guide.

Approved Shared Content from /shared/graduate-minimum-degree-requirements-and-satisfactory-progress/

Last Approved: Oct 25, 2018 11:29am

Minimum Graduate School Requirements

Review the Graduate School minimum academic progress and degree requirements in addition to the program requirements listed below.

Major Requirements

Mode of Instruction

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

Approved Shared Content from /shared/graduate-school-mode-instruction-definitions/

Last Approved: Oct 25, 2018 11:30am

**Evening/Weekend**: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

**Online**: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.

**Hybrid**: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

**Accelerated**: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

curricular Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework must be completed graduate level coursework. Courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide.</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required.</td>
</tr>
<tr>
<td>Other Graduate Requirements</td>
<td>Students must earn a B or above in all core curricular coursework.</td>
</tr>
<tr>
<td>Language Requirements</td>
<td>No language requirements.</td>
</tr>
</tbody>
</table>

required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP MATH 709</td>
<td>Translational and Outcomes Research in Health and Health Care</td>
<td>3</td>
</tr>
<tr>
<td>POP MATH 795</td>
<td>Foundations of Data-Driven Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>ISP E 601</td>
<td>Principles of Population Health Sciences</td>
<td>3</td>
</tr>
<tr>
<td>NURSING 702</td>
<td>Special Topics in Industrial Engineering (Human Factors Engineering in Healthcare Systems)</td>
<td>3</td>
</tr>
<tr>
<td>NURSING 715</td>
<td>Health Promotion and Disease Prevention in Diverse Communities</td>
<td>3</td>
</tr>
<tr>
<td>NURSING 772</td>
<td>Evaluation of Health Informatics Solutions</td>
<td>3</td>
</tr>
<tr>
<td>PHM PHM 617</td>
<td>Leadership and Organizational Decision Making in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>OTM 513</td>
<td>Health System Pharmacy Data Analysis and Informatics</td>
<td>2</td>
</tr>
<tr>
<td>BM M 1750</td>
<td>Cumulative Capstone in Clinical and Health Informatics</td>
<td>3</td>
</tr>
<tr>
<td>E D 706</td>
<td>Change Management</td>
<td>1</td>
</tr>
</tbody>
</table>

Total credits required: 30

Guide Graduate Policies tab

https://next-guide.wisc.edu/courseleaf/approve/?role=GRAD SCH Dept. Approver
Graduate School Policies

The Graduate School's Academic Policies and Procedures provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School with the degree program faculty. Policies set by the academic degree program can be found below.

Major-Specific Policies

Graduate Program Handbook

A Graduate Program Handbook containing all of the program's policies and requirements is forthcoming from the program.

Prior Coursework

Graduate Work from Other Institutions

If applicable to the program completing, and with program approval, students are allowed to count no more than 9 credits of graduate coursework in educational leadership from other institutions and 6 credits of graduate coursework in areas other than educational leadership from other institutions. Coursework earned five or more years prior to admission to the master's degree is not allowed to satisfy requirements.

UW–Madison Undergraduate

If applicable to the program completing and with program approval, 6 credits of coursework numbered 500 or above from a UW–Madison undergraduate degree are allowed to count toward the degree. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

UW–Madison University Special

With program approval, students are allowed to count no more than 6 credits of coursework numbered 300 or above taken as a UW–Madison special student. If necessary to meet the Graduate School minimum graduate credit requirements for the degree, special student coursework may need to be converted to graduate credits. Once converted, students are assessed the difference in tuition between special and graduate tuition. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

Probation

The Graduate School regularly reviews the record of any student who earned grades of B+, B, C, D, F, or incomplete in a graduate course (3.00 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

ADVISOR / COMMITTEE

An advisor is assigned to incoming students and will work with students individually to ensure they are making satisfactory progress toward a degree.

CREDITS PER TERM ALLOWED

12 credits

Time Constraints

Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

Other

Funding is not offered along with offers for admission.

Discuss expected progress to degree and time to degree. For undergraduate programs discuss considerations for supporting students to complete the degree in four academic years.

This is a fully online program and is created to support working adults in the clinical health professions. As such, the degree expects learners to be able to complete the degree in 2-3 years depending upon if a student takes a full or part-time course load.

Program Learning Outcomes and Assessment

List the program learning outcomes.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>enter one learning outcome per box. Use the green + to create additional boxes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Health: Describe and explain background knowledge of the history, goals, methods and challenges of the major health sciences, including human biology, genomics, clinical and translational science, healthcare delivery, personal health and population health.</td>
</tr>
<tr>
<td>2</td>
<td>Information Science and Technology: Demonstrate background knowledge of concepts, terminology, methods and tools of information science and technology for managing and analyzing data, information and knowledge.</td>
</tr>
<tr>
<td>3</td>
<td>Social and Behavioral Science: Evaluate the effects of social, behavioral, legal, psychological, management, cognitive, and economic theories, methods, and models applicable to health informatics from multiple levels including individual, social group, and society.</td>
</tr>
<tr>
<td>4</td>
<td>Health Information Science and Technology: Determine concepts and recognize tools for managing and analyzing biomedical and health data, information, and knowledge. Key foci include systems design and development, standards, integration, interoperability, and protection of biomedical and health information.</td>
</tr>
<tr>
<td>5</td>
<td>Human factors and Socio-technical Systems: Apply social behavioral theories and human factors engineering to better understand the interaction between users and information technologies within the organizational, social, and physical contexts of their lives, and apply this understanding in information system design.</td>
</tr>
<tr>
<td>6</td>
<td>Social and Behavioral Aspects of Health: Evaluate and apply social determinants of health and patient generated data to analyze problems arising from health or disease, recognize the</td>
</tr>
</tbody>
</table>
Implications of these problems on daily activities, and to recognize and/or develop practical solutions to managing these problems.

7 Social, Behavioral, and Information Science and Technology Applied to Health: Appraise the diverse foundational concepts and facets in order to develop integrative approaches to the design, implementation, and evaluation of health informatics solutions.

8 Professionalism: Demonstrate conduct that reflects the aims or qualities that characterize a professional person encompassing especially a defined body of knowledge and skills and their lifelong maintenance as well as adherence to an ethical code.

9 Interprofessional Collaborative Practice: Exhibits behavior that reflects the foundations of values/ethics, roles/responsibilities, interprofessional communication practices, and interprofessional teamwork for team-based practice.

10 Leadership: Demonstrates the following characteristics: credibility, honest, competence, ability to inspire, and ability to formulate and communicate a vision.

Summarize the assessment plan.

Direct evidence is provided primarily by student work product and process in the capstone course, and is supported by post-degree student outcomes, including attainment of career objectives. The program’s capstone course will be the primary source for direct assessment of student learning outcomes. In addition, the capstone course will conclude with final presentations that will showcase student work and be evaluated by sponsoring industry partners, the program’s steering committee, program instructors, the program’s advisory board, and other relevant partners in Madison and beyond.

The Division of Continuing Studies (DCS) distributes pre- and post-program degree surveys on behalf of all non-pooled, 131 programs to support program level indirect assessment requirements. These surveys meet the university indirect assessment requirements as they 1) identify which learning outcomes were assessed, 2) outline what data was collected and how, and 3) summarize key findings and recommendations. DCS compiles the survey information into various reports that programs can use for longitudinal review.

Student evaluations of teachers and classes are an important additional source of program assessment data, which can inform program and course design, instructional strategies, and program improvement.

During the implementation phase, the program will also carefully monitor student access to courses to ensure growth of course capacity to fully meet student demand, and student engagement and success to inform program, course and instructional design.

Approved Assessment Plan: Assessment Plan MS in Clinical and Health Informatics 20190930.pdf

Related Programs

Provide information on related programs offered by other UW System institutions and explain the extent to which the proposed program is distinct and how it overlaps or duplicates those programs.

Currently, there is just one graduate-level health science related degree and two certificates within the UW System in this domain. These UW System programs serve students interested in learning skills related to IT management within a healthcare setting.

UW-Milwaukee offers a Masters in Health Care Informatics and a Certificate in Health Care Informatics. The UW-Milwaukee master’s degree focuses on the automation of medical data and information and closely aligns with IT network design rather than clinical decision making. The courses are face-to-face and online for working IT professionals. The Certificate in Health Care Informatics is offered as a cooperative program among the College of Health Sciences, the Department of Health Informatics Administration, and the School of Information Studies. The certificate allows students to explore the three disciplines to build foundational knowledge across fields. According to the program website neither the degree nor the certificate is accredited.

The University of Wisconsin-Oshkosh offers a Healthcare Informatics Certificate. The program serves healthcare nurses interested in integrating computer science and information science to improve patient outcomes. The program is online with a required clinical practicum. Because the program serves nurses, this certificate allows students to be eligible to take the American Nursing Credentialing Center (ANCC) Informatics Nursing Certification exam.

Commitments

Courses in the curriculum are numbered 300 or higher.
Yes

The program faculty/staff will ensure the program website, Advance Your Career materials if applicable, and other presentations are consistent with the Guide information for this program.
Yes

Credential will not be awarded retroactively to students who completed all of the requirements before the credential was approved.
Yes

Supporting Information

List name and department of those who are in support of this proposal.

<table>
<thead>
<tr>
<th>Name (Last, First)</th>
<th>Date of contact/support letter received</th>
<th>School, College, or Department</th>
<th>Comment by contact person</th>
<th>On behalf of</th>
</tr>
</thead>
</table>
### Approve Pages

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Department/Program</th>
<th>Approval Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germain, Barry A</td>
<td>12/14/2018</td>
<td>School of Business (BUSINESS)</td>
<td>Sharing course offerings, using faculty, and supporting the programming.</td>
</tr>
<tr>
<td>Scott, Linda D</td>
<td>1/7/2019</td>
<td>School of Nursing (NURSING)</td>
<td>Sharing course offerings, using faculty, and supporting the program.</td>
</tr>
<tr>
<td>Willis, Danny Gayon</td>
<td>1/7/2019</td>
<td>School of Nursing (NURSING)</td>
<td>Sharing course offerings, using faculty, and supporting the program.</td>
</tr>
<tr>
<td>Swanson, Steven M</td>
<td>1/14/2019</td>
<td>School of Pharmacy (PHARMACY)</td>
<td>Sharing course offerings, using faculty, and supporting the program.</td>
</tr>
<tr>
<td>Newton, Michael A</td>
<td>1/18/2019</td>
<td>Biostatistics and Medical Informatics</td>
<td>Sharing course offerings, using faculty, and supporting the program.</td>
</tr>
<tr>
<td>Dunkin, Maureen S</td>
<td>12/10/2018</td>
<td>Population Health Sciences (POP HLTH)</td>
<td>Sharing course offerings, using faculty, and supporting the program.</td>
</tr>
<tr>
<td>Underoeth, Jeffrey T</td>
<td>1/14/2019</td>
<td>Industrial and Systems Engr (IND SYEGR)</td>
<td>Sharing course offerings, using faculty, and supporting the program.</td>
</tr>
<tr>
<td>Blanchard, James P</td>
<td>1/18/2019</td>
<td>College of Engineering (ENG/ENGINEERING)</td>
<td>Supporting the program.</td>
</tr>
</tbody>
</table>

If those supporting the proposal provided a letter or email of support upload here. A letter is NOT required. Upload any other explanatory information about support from other UW-Madison units.

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### Approvals

**Department Approval**: This proposal has been approved by the faculty at the department/academic unit level. The program faculty confirm that the unit has the capacity and resources (financial, physical, instructional, and administrative) to meet the responsibilities associated with offering the program, including offering the necessary courses, advising students, maintaining accurate information about the program in the Guide and elsewhere, conducting student learning assessment and program review, and otherwise attend to all responsibilities related to offering this program.

Enter any notes about approval here:

- **Entered by:** Sally Wedde For Allan Brazer
- **Date entered:** 4/11/2019

**School/College Approval**: This proposal has been approved at the school/college level and is submitted with the Dean's support. The Dean and program faculty confirm that the unit has the capacity and resources (financial, physical, instructional, and administrative) to meet the responsibilities associated with offering the program, including offering the necessary courses, advising students, maintaining accurate information about the program in the Guide and elsewhere, conducting student learning assessment and program review, and otherwise attend to all responsibilities related to offering this program.

Enter any notes about approval here:

- **SMHP/ACP approved 10/16/19**

**GFC Approval**: This proposal has been approved by the Graduate Faculty Executive Committee and the Dean of the Graduate School.

Enter any notes about the approval here:

**GAPC Approval**: This proposal has been approved by the University Academic Planning Council and the Provost.

For Administrative Use

Admin Notes:

Guide URL:

Effective date:

Career:

SIS Program Code:

SIS Short Description:

Other plan codes associated with this program:

Diploma Type:

Diploma Type 2:

Degree:

Field of Study:

https://next-guide.wisc.edu/courseleaf/approve/?role=GRAD SCH Dept. Approver
Program Length: 
National Student 
Clearing House 
Classification: 
Plan Group: 
Educational Level: 
Award Category: 
Enrollment 
Category: 
GIP Code: 
STEMOPT: 
UWSSTEM: 
HEALTH: 
Educational 
Innovation 
Program: 
Distance Education 
Program: 
Non Traditional 
Program: 
Special Plan Type: 
Added to UW 
System Crosswalk:

Reviewer Comments 
Andrea D Pooching (adpooho) (04/11/19 3:00 pm): Rollback: See 4/11/19 email. 
Sally E Wedde (sewedde) (06/20/19 10:55 am): Rollback: Sending back so you can add the 
MOU 
Regina Ann Lowery (lowerey) (10/04/19 9:07 am): Learning outcomes: Editorial - #7, 
"Appraise and apply..."? #9 change to "Exhibit" and #10 change to "Demonstrate" to match 
other statements. Format accepted after changes. 
Regina Ann Lowery (lowerey) (10/04/19 9:09 am): Assessment plan: Accepted. 
Andrea D Pooching (adpooho) (10/09/19 2:40 pm): Replaced "BOR_MS_CHI_New Program 
Authorization" with Milner's edited 10_5_2019 version. 
Karen E Mittelstadt (mittelstadt) (10/15/19 5:25 pm): The School of Nursing is in support of 
this MS-CHI proposal and has partnered with the SMFP/ICTR/DGS developers to consider ways 
nursing can help advance and benefit from this new program. 
Elia Mae Matsumura (emmatau) (10/16/19 8:14 pm): 1. Enno Siemsen is listed as a program 
advisor but his department is missing from his professor title. His description should be: 
Associate Dean MBA and Masters Programs and Professor of Operations & Information 
Management. 2. Professor Robert Batt is listed as one of the core program faculty. He will help 
with oversight of the course offered by his department but does not plan to teach it. 
Quinn H Fullerjamp (qfulljen) (10/22/19 9:07 am): The Population Health Sciences 
Curriculum Committee supports this proposal. The Curriculum Committee has not been 
informed of any movement to have the two PHS classes changed to an online format at this 
time. 10/23/19.
May 10, 2019

TO: Sarah Mangelsdorf, Provost and Vice Chancellor for Academic Affairs  
    UW-Madison

FROM: Carleen Vande Zande, Associate Vice President

RE: Approval to Plan an M.S. in Clinical and Health Informatics

In an email dated April 19, 2019, your office invited all of the UW System institutions and the Office of Academic Programs and Educational Innovation to comment on your proposal to plan an M.S. in Clinical and Health Informatics. On May 4, 2019, your office forwarded a compilation of the responses to our office and to the Provosts at all UW institutions. The responses indicated there were no objections to the program.

As part of our review, we note that one UW institution offers a similar degree or program. UW-Milwaukee offers an M.S. in Health Care Informatics. Because 50% or fewer of the institutions offer the proposed program, it does not fall under the definition of “unnecessary duplication” as defined by SYS 102. I am pleased to grant your request for approval to plan this program that will be offered exclusively via distance delivery.

After you have reviewed the Request for Authorization to implement document, the Cost and Revenue Projections spreadsheet, and the Cost and Revenue Projections narrative, please submit them along with your Letter of Commitment to apei@uwsa.edu. Templates are located at https://www.wisconsin.edu/program-planning/. Request for Authorization documents need to be sent at least eight weeks in advance of the Board of Regents meeting at which you would like the program to be considered for approval.

This approval to plan will expire three years after the date of this memo if the Board of Regents has not authorized this program prior to that date.

Please contact Diane Treis Rusk at dtreisrusk@uwsa.edu or 608.261.1115 if you would like assistance with the development of the authorization documents.

c: Rebecca Blank, Chancellor, UW-Madison  
    Provosts and Vice Chancellors for Academic Affairs  
    Jocelyn Milner, Vice Provost, UW-Madison  
    UW Institution Program Planning Liaisons  
    UWSA Program Planning, Review, and Array Management Team
Notice of Intent

University of Wisconsin-Madison

Master of Science in Clinical and Health Informatics

Degree/Plan Name: Master of Science in Clinical and Health Informatics
Academic Home: Institute for Clinical and Translational Research
School/College: School of Medicine and Public Health (SMPH)
Delivery: Online
Program Contact: Elizabeth Burnside, Associate Dean, School of Medicine and Public Health
UW-Madison Contact: Jocelyn Milner, Vice Provost for Academic Affairs (Jocelyn.milner@wisc.edu)

Summary

The proposed MS-Clinical and Health Informatics will be housed in the Institute for Clinical and Translational Research (ICTR) in the School of Medicine and Public Health. The program will serve working professionals in the healthcare industry through a fully online curriculum, and seek to become Wisconsin’s first Master’s program accredited by the Commission on Accreditation for Health Informatics and Information Management (CAHIIM). The program collaborators include the School of Medicine and Public Health, College of Engineering, School of Nursing, School of Pharmacy and School of Business. This interdisciplinary approach is essential to providing the expertise from population health, biomedical informatics, industrial systems engineering, nursing, pharmacy, and healthcare operations management needed to provide clinicians, nurses, pharmacists, researchers, administrators and health information technologists the tools and methods to assess the effect of health innovations on policy, clinical practice, security, and biomedical and health information systems.

Need for the Program

The 2017 Leadership and Workforce study conducted by the research arm of the Healthcare Information and Management Systems Society (HIMSS) found that 61% of healthcare organizations and vendors are expecting to increase hiring in the upcoming few years, with a projected increase of 21%. In Wisconsin alone that year, more than 900 job postings were looking for people with 3-5 years of clinical experience and a master’s in a data field. Expertise in clinical and health informatics is also required in the top tier of job openings that involve electronic health record analysis, database design and clinical operational management, health modeling and health care data security. The market demand according to the Educational Advisory Board Report on Health Professions saw a national demand of over 35,000 job postings in 2016 asking for the informatics skills listed.

Local employers include Deloitte, General Electric, Vital Tech solutions, UW Health and Epic. Recent job titles for careers in clinical healthcare informatics include Medical Informatics Project Directors,

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3 https://laborinsight.burning-glass.com/jobs/us/#/snapshots/display2018
Researchers, and Systems Analysts, along with Clinical Informatics Directors, Specialists, Coordinators and Analysts. The need for data skills is also increasingly becoming a necessity in the healthcare industry. Given the growing demand, the University of Wisconsin-Madison will leverage our institution’s cutting-edge work in the School of Medicine and Public Health, where medical and population health research already have a strong record to inform best practices in the clinical setting. This program will leverage the expertise of faculty across the university to build upon a growing need to leverage informatics expertise in the healthcare space where evidence-based decision-making and data-informed care are essential. Students will leave this program with skills to enhance their professional practices in the clinical healthcare setting and as business and informatics leaders drawing from operational and healthcare management, health informatics, and information technology skills to solve complex problems of the social-behavioral aspects of health.

The program expects to enroll 100 clinicians and healthcare information technology professionals per year by the fourth year after implementation. Scale is possible with cohorts starting in multiple terms. Students will be able to complete the program in 2-3 years depending upon if they attend full time (2 years) or part time (3 years).

**Context within UW-Madison and UW System Program Array**

Currently there is just one graduate-level health science related degree and two certificates within the UW System in this domain. These UW System programs serve students interested in learning skills related to IT management within a healthcare setting. UW-Milwaukee offers a Masters in Health Care Informatics and a Certificate in Health Care Informatics. This UW-Milwaukee master’s degree focuses on the automation of medical data and information and closely aligns with IT network design than clinical healthcare decision-making. Courses are face-to-face and online for working IT professionals. The Certificate in Health Care Informatics is offered as a cooperative program among the College of Health Sciences, the Department of Health informatics Administration, and the School of Information Studies. The certificate allows students to explore the three disciples to build foundational knowledge across fields. According to the program website neither the degree nor the certificate is accredited. Additionally, the University of Wisconsin-Oshkosh offers a Healthcare Informatics Certificate. The program serves healthcare nurses interested in integrating computer science and information science to improve patient outcomes. The program is online with a required clinical practicum. Because the program serves nurses, this certificate allows students to be eligible to take the ANCC Informatics nursing certification exam.

The proposed UW-Madison program will serve a different audience including healthcare professionals with clinical experience interested in managing large healthcare enterprise solutions and implementing system-based solutions to improve patient outcomes. Students will be required to have work experience in clinical healthcare or a degree in a clinical discipline (M.D., R.N., PharmD, etc.) and proficiency with basic statistics. Within the University of Wisconsin-Madison, the School of Medicine and Public Health offers an on-campus full-time M.S. Degree in Biomedical Data Science. The program is research and thesis-based. MS students study methodologies from computer sciences and statistics to contribute to

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the solutions central to computational problems in biomedicine through building algorithms and coding simulations for population health research, statistical genetics and biomedical informatics.

Additionally, the on-campus full-time MS in Statistics named option in biostatics at UW-Madison serves research and thesis-based students who work in the theory, methodology, and application of statistics. The program focuses primarily on the statistics of biomedical sciences and differs from informatics with a focus on the computation and mathematical application of designing experiments and survey samples. Informatics in contrast focuses on the interaction between humans and information.

The proposed degree also differs in that will be accredited and all courses will be offered online for working healthcare professionals. The curriculum focuses on application and applied tools used in a clinical or healthcare setting and will not offer a thesis option. Faculty in the Institute for Clinical and Translational Research, the program’s academic home, are working to create new online courses focused more on data-driven medicine and system-based decision making with an informatics focus to serve practicing professionals that wish to expand their leadership roles through data-based decision making. This is part of the School of Medicine and Public Health’s strategic vision and planning mission, creating vital connections between basic discovery and clinical/translational research, and providing programs that support the health and wellness of individuals and populations.

This program also supports the UW-Madison campus strategic framework goal to improve access (through online delivery) and “build innovative professional master’s-level degrees and other lifeline learning experiences.”

**Curriculum and Learning Outcomes**

The program learning outcomes are based on AMIA Health Informatics Core Competencies for CAHIIM Accreditation. This program will seek accreditation to support the mission and vision of next generation of informatics professionals. Accreditation is key differentiator for our program and leverages key expertise across disciplines and expertise across faculty departments to leverage all 10 competencies in a degree program that spans expertise in data management, interprofessional practice, and data design, systems and operational management across healthcare fields.

The program learning outcomes/competencies are:

1. **Health**: The background knowledge of the history, goals, methods and challenges of the major health sciences, including human biology, genomics, clinical and translational science, healthcare delivery, personal health and population health.
2. **Information Science and Technology**: The background knowledge of concepts, terminology, methods and tools of information science and technology for managing and analyzing data, information and knowledge.
3. **Social and Behavioral Science**: The background knowledge of the effects of social, behavioral, legal, psychological, management, cognitive, and economic theories, methods, and models applicable to health informatics from multiple levels including individual, social group, and society.
4. **Health Information Science and Technology**: The knowledge, skills, and attitudes to use concepts and tools for managing and analyzing biomedical and health data, information, and

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7 https://chancellor.wisc.edu/strategicplan2/ed_experience.html
knowledge. Key foci include systems design and development, standards, integration, interoperability, and protection of biomedical and health information.

5. **Human Factors and Socio-technical Systems**: The knowledge, skills and attitudes to apply social behavioral theories and human factors engineering to better understand the interaction between users and information technologies within the organizational, social, and physical contexts of their lives, and apply this understanding in information system design.

6. **Social and Behavioral Aspects of Health**: The knowledge, skills, and attitudes to use social determinants of health and patient-generated data to analyze problems arising from health or disease, to recognize the implications of these problems on daily activities, and to recognize and/or develop practical solutions to managing these problems.

7. **Social, Behavioral, and Information Science and Technology Applied to Health**: The knowledge, skills and attitudes to apply the diverse foundation concepts and facets in order to develop integrative approaches to the design, implementation, and evaluation of health informatics solutions.

8. **Professionalism**: The conduct that reflects the aims or qualities that characterize a professional person encompassing especially a defined body of knowledge and skills and their lifelong maintenance as well as adherence to an ethical code.

9. **Interprofessional Collaborative Practice**: Behavior that reflects the foundations of values/ethics, roles/responsibilities, interprofessional communication practices, and interprofessional teamwork for team-based practice.

10. **Leadership**: Behavior that demonstrates the following characteristics: credibility, honest, competence, ability to inspire, and ability to formulate and communicate a vision.

This 30-credit master’s degree is designed as a 2 year full-time or 3 year part-time online program for adults working in either clinical healthcare or who have a strong analytical background in science and statistics related to healthcare. The majority of the courses are currently available and will be converted to an online platform to serve this new body of students. There are also several new courses in development.

The curriculum outline is as follows (30 credits):

- Health Informatics Systems: Knowledge of Healthcare
- Data Driven Medicine
- Healthcare Quality Improvements
- Human Factors Engineering Design and Evaluation
- Core Principles of Population Health Sciences
- Healthcare Operations Management
- Organizational Communication for Healthcare Professionals
- Regulatory Practice and Compliance
- Translational and Outcomes Research in Health and Health Care
- Clinical and Health Informatics Capstone

The MS in Clinical and Health Informatics will leverage expertise across several schools and departments across the University of Wisconsin-Madison. The expertise and variety of interdisciplinary coursework will make our program competitive to solve challenging problems in the healthcare arena.
Faculty and Staff

The core faculty and staff supporting development of this program include:

- Elizabeth Meyerand, Professor School of Medicine and Public Health and Professor of Medical Physics and Co-Director of the Women in Science and Engineering Leadership Institute
- Elizabeth Burnside, Deputy Executive Director of the Institute for Clinical and Translational Research (ICTR) and Associate Dean in the School of Medicine and Public Health
- Enno Seimsen, Associate Dean of the MBA and Master’s Programs, Executive Director of the Erdman Center for Operations and Technology Management
- Jack Temple, Clinical Associate Professor, School of Pharmacy Manager, Information Technology and Medication Use Systems, UW Health
- Maureen Smith, Professor in the Departments of Population Health Sciences, and Family Medicine and Community Health, School of Medicine and Public Health
- Barbara Pinekenstein, Clinical Professor, School of Nursing
- Linsey Steege, Associate Professor, School of Nursing

The master’s program will be housed within the UW Institute for Clinical and Translational Research (ICTR), administered by the School of Medicine and Public Health (SMPH), and supported by an oversight board with members from the School of Nursing, School of Pharmacy, School of Veterinary Medicine and the College of Engineering. ICTR is designated an administrative body for educational programs under the academic authority of the School of Medicine and Public Health. The new MS program will be governed by a faculty executive committee and a curriculum subcommittee. The executive committee is led by a faculty chair and includes the ICTR Training Director as a non-voting member. The curriculum subcommittee votes on recommendations, which are presented to the executive committee for approval.

A Faculty Director will be hired. Laura Ladick is the Assistant Program Director for Biomedical Informatics and will serve as the Administrative Lead for Student Services and support and coordinate student recruitment efforts. A Program Director will be hired to facilitate the incorporation and maintenance of curricular offerings, create a marketing, recruitment, and admission plan, and manage appropriate budgets. Students will be academically advised by faculty and staff members from ICTR and its strong interdisciplinary team approach. Student and career services will be provided through ICTR.

Funding

This program is expected to be self-funded through tuition revenue within 3 years of implementation. Enrollment will begin with 25 students and increase with additional cohorts of at least 25 students per year until a goal of 100 students is reached in Year 4 after launch. The program will also request an online per credit tuition tier based on the competitive space for this discipline, which will be decided by the time of the development of the full proposal.

Table 1: Enrollment and Direct Revenue Projections

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<thead>
<tr>
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<th>Development</th>
<th>Launch and Grow</th>
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<tbody>
<tr>
<td>Enrollment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Credits taught</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Funding for program development is supported by the Schools and Colleges participating in program development, along with additional support from the Division of Continuing Studies.

Additional Approvals

No additional approvals are required beyond the Board of Regents. We will seek accreditation related to this program from the Commission on Accreditation for Health Informatics and Information Management (CAHIIM).
Assessment Plan

MASTERS OF SCIENCE IN CLINICAL HEALTH INFORMATICS

Identifying Information
School/College: School of Medicine and Public Health
Graduate Degree/Major Program Name: Clinical and Health Informatics
Graduate Degree Level (M.S., M.A., Ph.D., DMA, etc.): M.S.
Faculty Director Contact/Title: Elizabeth Burnside, MD, MPH, MS, Professor, Radiology, Associate Dean of Team Science and Interdisciplinary Research, Deputy Executive Director for the Institute for Clinical and Translational Research
Beth Meyerand, PhD, Associate Chair of Graduate Advising and Professor
Primary Contact Information: Sherry Fontaine

Student Learning Outcomes
*Please note that all learning outcomes for this program are from the AMIA accreditation body which this program will be accredited through.

1. **Health:** Describe and explain background knowledge of the history, goals, methods and challenges of the major health sciences, including human biology, genomics, clinical and translational science, healthcare delivery, personal health and population health.

2. **Information Science and Technology:** Demonstrate background knowledge of concepts, terminology, methods and tools of information science and technology for managing and analyzing data, information and knowledge.

3. **Social and Behavioral Science:** Evaluate the effects of social, behavioral, legal, psychological, management, cognitive, and economic theories, methods, and models applicable to health informatics from multiple levels including individual, social group, and society.

4. **Health Information Science and Technology:** Determine concepts and recognize tools for managing and analyzing biomedical and health data, information, and knowledge. Key foci include systems design and development, standards, integration, interoperability, and protection of biomedical and health information.
5. **Human Factors and Socio-technical Systems**: Apply social behavioral theories and human factors engineering to better understand the interaction between users and information technologies within the organizational, social, and physical contexts of their lives, and apply this understanding in information system design.

6. **Social and Behavioral Aspects of Health**: Evaluate and apply social determinants of health and patient-generated data to analyze problems arising from health or disease, to recognize the implications of these problems on daily activities, and to recognize and/or develop practical solutions to managing these problems.

7. **Social, Behavioral, and Information Science and Technology Applied to Health**: Appraise diverse foundation concepts and facets in order to develop integrative approaches to the design, implementation, and evaluation of health informatics solutions.

8. **Professionalism**: Demonstrates conduct that reflects the aims or qualities that characterize a professional person encompassing especially a defined body of knowledge and skills and their lifelong maintenance as well as adherence to an ethical code.

9. **Interprofessional Collaborative Practice**: Exhibits behavior that reflects the foundations of values/ethics, roles/responsibilities, interprofessional communication practices, and interprofessional teamwork for team-based practice.

10. **Leadership**: Demonstrates the following characteristics: credibility, honest, competence, ability to inspire, and ability to formulate and communicate a vision as an emerging leader in clinical health informatics.

**Plan for Assessing Each Student Learning Outcome**

For each of the degree major/program student learning outcomes, indicate how the program plans to assess whether or not students are meeting the expectation, as well as when each learning outcome will be assessed. Keep in mind that each academic degree program is expected to engage in at least one assessment activity per year and assessment activities, in total, must include one direct assessment method. While programs do not need to assess each learning outcome every year, all learning outcomes must be assessed within a period of three years.
# MS Clinical and Health Informatics

| PLO | 1. Describe and explain background knowledge of the history, goals, methods and challenges of the major health sciences, including human biology, genomics, clinical and translational science, healthcare delivery, personal health and population health. | 2. Demonstrate background knowledge of concepts, terminology, methods and tools of information science and technology for managing and analyzing data, information and knowledge. | 3. Evaluate the effects of social, behavioral, legal, psychological, management, cognitive, and economic theories, methods, and models applicable to health informatics from multiple levels including individual, social group, and society. | 4. Determine concepts and recognize tools for managing and analyzing biomedical and health data, information, and knowledge. Key foci include systems design and development, standards, integration, interoperability, and protection of biomedical and health information. | 5. Apply social behavioral theories and human factors engineering to better understand the interaction between users and information technologies within the organizational, social, and physical contexts of their lives, and apply this understanding in information system design. | 6. Evaluate and apply social determinants of health and patient-generated data to analyze problems arising from health or disease, to recognize the implications of these problems on daily activities, and to recognize and/or develop practical solutions to managing these problems. | 7. Appraise diverse foundation concepts and facets in order to develop integrative approaches to the design, implementation, and evaluation of health informatics solutions. | 8. Demonstrates conduct that reflects the aims or qualities that characterize a professional person encompassing especially a defined body of knowledge and skills and their lifelong maintenance as well as adherence to an ethical code. | 9. Exhibits behavior that reflects the foundations of values/ethics, roles/responsibilities, interprofessional communication practices, and interprofessional teamwork for team-based practice. | 10. Demonstrates the following characteristics: credibility, honesty, competence, ability to inspire, and ability to formulate and communicate a vision as an emerging leader in clinical health informatics. |

**Method for assessing learning (at least one)**

Indirect: Pre-Degree survey will assess familiarity and prior experience with this learning outcome, and Post-Degree assessment will assess students’ self-reported level of preparation on each learning outcome. This will occur for every enrollment and graduation term to track student learning at the program level, learning goals and expectations as well as how the program is preparing students for their degree goals/needs.

*If you have questions, please contact regina.lowery@wisc.edu*
<table>
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<tr>
<th>direct method required</th>
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<tr>
<td>Direct: Rigorous evaluations of the Capstone projects at the end of the Fall and Spring semesters, as well as formative assessments in the form of case study presentations, strategic planning across interprofessional teams for data</td>
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<table>
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<tr>
<th>Table for assessment activity (at least one activity each year; all outcomes reviewed in a 3-year cycle)</th>
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<tbody>
<tr>
<td>Due to the online-part-time learners expected to enroll in this MS program, the summative view of the learning outcomes will be assessed at the end of the program once per year within the Capstone course – beginning in the spring for and eventually giving students two times per year to complete all course for the end of the program with the capstone occurring at the end of Fall semester and Spring semester respectively. Students will complete the indirect assessments (pre-degree and post-degree survey) when they begin and end the program.</td>
</tr>
</tbody>
</table>
Also provide answers to the following questions as part of your assessment plan.

**Who is responsible for assessment?** The MS Design + Innovation Program Director, will coordinate the implementation of the assessment plan annually. They will work with the Division of Continuing Studies to conduct the pre- and post-survey indirect assessments, as well as work with faculty and staff advisors to complete all direct assessments. Assessment data will be forwarded to the steering committee for evaluation and further dissemination.

**What is the plan for review of the assessment information?** Annually, at the September meeting of the steering committee, assessment results (compiled by Laura Ladick) will be reviewed. The steering committee will produce an initial summary to be presented at the “All Faculty” department meeting held early in the Fall (usually scheduled in October) of each academic year.

**What is the plan for production of an annual summary report?** After reviewing the assessment summary and comments from the “All Faculty” department meeting, the degree program’s executive committee will decide which (if any) items are actionable and provide a report of those plans, along with the initial assessment summary, to the Provost office by October 1st.

**How will recommendations be implemented?** Any actionable items will be discussed during steering committee meetings held in the late Fall semester. Proposals will be developed and go through the appropriate governance steps at that time. If approved, any curricular/programmatic/co-curricular changes will be implemented the following Summer semester or thereafter. The department will monitor all new implementations annually, with a more comprehensive report being compiled during the appropriate student learning outcome assessment year (within the 3-year timeline).

- **Degree/Major Program Courses/Experiences** – List all degree requirements (in some cases co-curricular experiences may also be included). Feel free to add rows as needed.
- Indicate with a check (X) where the course or learning experience contributes to each of the learning outcomes. Courses may contribute to multiple learning outcomes
### MS Clinical and Health Informatics

- Because LO’s are accreditation-based and long-we have a short hand description label for each one listed below

<table>
<thead>
<tr>
<th>Degree Program Required Courses or Experiences</th>
<th>Learning Outcome #1 Health</th>
<th>Learning Outcome #2 Information Science and Technology:</th>
<th>Learning Outcome #3 Social and Behavioral Science:</th>
<th>Learning Outcome #4 Health Information Science and Technology</th>
<th>Learning Outcome #5 Human Factors and Socio-technical Systems:</th>
<th>Learning Outcome #6 Social and Behavioral Aspects of Health:</th>
<th>Learning Outcome #7 Social, Behavioral, and Information Science and Technology Applied to Health</th>
<th>Learning Outcome #8 Professionalism:</th>
<th>Learning Outcome #9 Interprofessional Collaborative Practice</th>
<th>Learning Outcome #10 Leadership</th>
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<tbody>
<tr>
<td>Course #1 POPHLTH 709 Translational and Outcomes Research in Health and Health Care Maureen Smith</td>
<td>X</td>
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<tr>
<td>Course #2 PHM PRAC 617 Health System Pharmacy Data Analysis and Informatics Jack Temple</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>Course #3 BMI573 Foundations of Data-Driven Healthcare Mark Craven</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
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</tr>
</tbody>
</table>

*If you have questions, please contact regina.lowery@wisc.edu (v. 08-11-17)*
| Course #4 | NURSING 715  
Evaluation of Health Informatics Solutions  
Linsey Steege | X | X | X | X | X |
| Course #5 | I SY E601 Special Topics: Human Factors Engineering for Healthcare Systems  
Nicole Werner | X | X | X | X |
| Course #6 | POPHLTH 795  
Principles of Population Health Sciences  
Maureen Smith | X | X | X | X |
| Course #7 | OTM 753  
Healthcare Operations Management  
Bob Batt | X | X | X |
| Course #8 | NURSING 772  
Leadership and Organizational  |

If you have questions, please contact regina.lowery@wisc.edu
Please email your program's Assessment Plan Template and Curriculum Map Worksheet to regina.lowery@wisc.edu by July 1, 2016.

If you have questions, please contact regina.lowery@wisc.edu
For Undergraduate Degree Program Assessment Plan Template, see the UW Madison Assessment website.

https://assessment.provost.wisc.edu
Dear Dr. Brasier:

Thank you for sharing the Notice of Intent to develop a new online, interdisciplinary degree program in Clinical and Health Informatics. This growing field is critically important for health care improvement, and we are pleased to provide our support for this innovative program.

We look forward to contributing as needed to the program’s development over the next two years. With your support, we would be interested in exploring course offerings that would benefit the curriculum and call upon the expertise of our faculty in pharmacy’s expertise in health system pharmacy data analysis and informatics. We understand that our faculty would receive funding and instructional design support through the Division of Continuing Studies to participate in this planning effort, and that any instruction in the future would be compensated through program revenue and a signed Memorandum of Agreement with the School of Medicine and Public Health.

We look forward to supporting your efforts in this exciting new program area with you in the future.

Sincerely,

Steven M. Swanson, PhD
Dean and Professor
January 18, 2019

Allan Brasier, Executive Director  
UW Institute for Clinical and Translational Research  
School of Medicine and Public Health  
University of Wisconsin-Madison

Dear Dr. Brasier,

The College of Engineering supports the creation of a new online MS degree program in Clinical and Health Informatics. Our College offers educational and research opportunities for students with interests in health care and we feel that this program complements our offerings. We are pleased to be a part of this program and look forward to contributing to the curriculum.

Sincerely,

James P. Blanchard  
Executive Associate Dean  
blanchard@engr.wisc.edu
January 18, 2019

Allan Brasier, MD  
Executive Director  
Institute for Clinical and Translational Research  
School of Medicine and Public Health  
University of Wisconsin-Madison

Dear Dr. Brasier,

Thank you for sharing the Notice of Intent to develop a new online, interdisciplinary degree program in Clinical and Health Informatics. This growing field is critically important for health care improvement, and we are pleased to provide support from the Department of Biostatistics and Medical Informatics (BMI) for this innovative program.

As you know, BMI has a strong and successful history of being a world-leader in applying statistical and informatics methods to solve difficult health-care problems. Our department looks forward to collaborating and contributing as needed for your program’s development. Specifically, we are interested in exploring course offerings to benefit the Clinical and Health Informatics degree program that draw upon the specific research and teaching expertise of BMI’s faculty. In fact, we already have classes that I believe could add significant value to your curriculum.

We understand that BMI faculty may receive funding and instructional design support through the Division of Continuing Studies to participate in this planning effort, and that BMI will receive compensation from program revenue for any teaching done by our faculty in support of the Clinical and Health Informatics degree program.

We look forward to supporting your efforts in this exciting new program area with you in the future.

Sincerely,

Michael A. Newton, PhD  
Professor and Interim Chair
Monday, December 10, 2018

Allan Brasier, Executive Director
UW Institute for Clinical and Translational Research
School of Medicine and Public Health
University of Wisconsin-Madison

Dear Dr. Brasier,

Thank you for sharing the Notice of Intent to develop a new online, interdisciplinary degree program in Clinical and Health Informatics. This growing field is critically important for health care improvement, and we are pleased to provide our support for this innovative program.

We look forward to contributing as needed to the program’s development over the next two years. With your support, we would be interested in exploring course offerings that would benefit the curriculum and call upon the expertise of the Department of Population Health Sciences. We understand that our faculty would receive funding and instructional design support through the Division of Continuing Studies to participate in this planning effort, and that any instruction in the future would be compensated through program revenue and a signed Memorandum of Agreement with the School of Medicine and Public Health.

We look forward to supporting your efforts in this exciting new program area with you in the future.

Sincerely,

Maureen Durkin, PhD, DrPH
Evan and Marion Helfaer Professor of Public Health
Chair, Department of Population Health Sciences
University of Wisconsin School of Medicine and Public Health
January 14, 2019

Allan Brasier, Executive Director
UW Institute for Clinical and Translational Research
School of Medicine and Public Health
University of Wisconsin-Madison

Dear Dr. Brasier,

Thank you for sharing the Notice of Intent to develop a new online, interdisciplinary degree program in Clinical and Health Informatics. This growing field is critically important for health care improvement, and we are pleased to provide support from the Department of Industrial and Systems Engineering (ISyE) for this innovative program.

As you know, ISyE has a strong and successful history of being a world-leader in applying engineering principles to solve difficult health-care problems. Our department looks forward to collaborating and contributing as needed for your program’s development. Specifically, we would be interested in exploring course offerings to benefit the Clinical and Health Informatics degree program that draw upon our department’s specific research and teaching expertise. In fact, we already have classes that I believe could add significant value to your curriculum.

We understand that our faculty would receive funding and instructional design support through the Division of Continuing Studies to participate in this planning effort, and that any instruction in the future would be compensated through program revenue and a signed Memorandum of Agreement between the School of Medicine and Public Health and the College of Engineering.

We look forward to supporting your efforts in this exciting new program area with you in the future.

Sincerely,

Jeff Linderoth
Harvey D. Spangler Professor and Department Chair
Department of Industrial and Systems Engineering
University of Wisconsin-Madison
January 7, 2019

Allan Brasier, Executive Director
UW Institute for Clinical and Translational Research
School of Medicine and Public Health
University of Wisconsin-Madison

Dear Dr. Brasier,

Thank you for sharing the Notice of Intent to develop a new online, interdisciplinary degree program in Clinical and Health Informatics. This growing field is critically important for health care improvement. In principle and philosophy, we are pleased to provide our support for this innovative program.

We look forward to contributing as needed to the program's development over the next two years. With your support, we would be interested in exploring course offerings that would benefit the curriculum and call upon our faculty expertise in health and health care systems leadership and organizational decision-making. We understand that our faculty would receive funding and instructional design support through the Division of Continuing Studies to participate in this planning effort, and that any instruction in the future would be compensated through program revenue and a signed Memorandum of Agreement with the School of Medicine and Public Health.

We look forward to supporting your efforts in this exciting new program area with you in the future.

Sincerely,

Linda D. Scott, PhD, RN, NEA-BC, FAAN
Dean and Professor
University of Wisconsin-Madison School of Nursing

Danny G. Willis, DNS, RN, PMHCNS-BC, FAAN
Associate Dean for Academic Affairs
University of Wisconsin-Madison School of Nursing
MEMORANDUM

Date: December 14, 2018

To: Allan Brasier, Executive Director, UW Institute for Clinical and Translational Research, School of Medicine and Public Health, UW-Madison

From: Barry Gerhart, Interim Albert O. Nicholas Dean, Wisconsin School of Business

Re: Support for intent to create online degree program in Clinical and Health Informatics

Thank you for sharing the Notice of Intent to develop a new online, interdisciplinary degree program in Clinical and Health Informatics. This growing field is critically important for health care improvement, and we are pleased to provide our support for this innovative program.

We look forward to discussing how we might contribute to the program’s development over the next two years. With your support, we would be interested in exploring course offerings that would benefit the curriculum and call upon our expertise in health informatics, health operations, and related areas. We understand that our faculty would receive funding and instructional design support through the Division of Continuing Studies to participate in this planning effort, and that any instruction in the future would be compensated through program revenue and a signed Memorandum of Agreement with the School of Medicine and Public Health.

We look forward to supporting your efforts in this exciting new program area with you in the future.

Copies:
Enno Siemsen, Associate Dean of Masters Programs, WSB
Ella Mae Matsumura, Senior Associate Dean of Academic Programs, WSB
Mary Thompson, Division of Continuing Studies
### Department Investments (using the margin) - notional example

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition Revenue</td>
<td>$ -</td>
<td>$504,000</td>
<td>$1,424,000</td>
<td>$2,064,000</td>
<td>$2,720,000</td>
<td>$3,188,000</td>
<td>$3,344,000</td>
<td>$3,344,000</td>
<td>$3,344,000</td>
<td>$3,344,000</td>
</tr>
<tr>
<td>Campus Share</td>
<td>$ -</td>
<td>$45,360</td>
<td>$128,160</td>
<td>$185,760</td>
<td>$244,800</td>
<td>$285,120</td>
<td>$300,960</td>
<td>$300,960</td>
<td>$300,960</td>
<td>$300,960</td>
</tr>
<tr>
<td>School/College Share</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>Instructional Cost</td>
<td>$10,000</td>
<td>$209,000</td>
<td>$564,000</td>
<td>$814,000</td>
<td>$1,060,000</td>
<td>$1,228,000</td>
<td>$1,294,000</td>
<td>$1,294,000</td>
<td>$1,294,000</td>
<td>$1,294,000</td>
</tr>
<tr>
<td>Support Cost</td>
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<td>$168,743</td>
<td>$451,218</td>
<td>$541,867</td>
<td>$557,119</td>
<td>$577,810</td>
<td>$587,610</td>
<td>$597,410</td>
<td>$607,210</td>
<td>$617,010</td>
</tr>
<tr>
<td>Program Development</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td>Program Development - DCS Course</td>
<td>$16,830</td>
<td>$378,983</td>
<td>$173,538</td>
<td>$166,000</td>
<td>$162,500</td>
<td>$159,000</td>
<td>$155,500</td>
<td>$152,000</td>
<td>$148,500</td>
<td>$145,000</td>
</tr>
<tr>
<td>Program Development - DCS Course</td>
<td>$ -</td>
<td>$140,000</td>
<td>$45,500</td>
<td>$24,750</td>
<td>$24,750</td>
<td>$24,750</td>
<td>$24,750</td>
<td>$24,750</td>
<td>$24,750</td>
<td>$24,750</td>
</tr>
<tr>
<td>DCS Marketing</td>
<td>$ -</td>
<td>$25,000</td>
<td>$49,000</td>
<td>$101,291</td>
<td>$276,337</td>
<td>$277,404</td>
<td>$278,571</td>
<td>$280,738</td>
<td>$281,905</td>
<td>$283,072</td>
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<td>Total Program Investment</td>
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<td>$543,983</td>
<td>$268,038</td>
<td>$292,041</td>
<td>$301,087</td>
<td>$302,154</td>
<td>$303,242</td>
<td>$304,351</td>
<td>$305,484</td>
<td>$306,638</td>
</tr>
<tr>
<td>Total Operating Margin</td>
<td>$(119,330)</td>
<td>$(513,486)</td>
<td>$(129,816)</td>
<td>$(23,932)</td>
<td>$(290,280)</td>
<td>$(487,988)</td>
<td>$(556,212)</td>
<td>$(549,510)</td>
<td>$(534,037)</td>
<td>$(530,192)</td>
</tr>
<tr>
<td>Payback (unit investment)</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
<td>3.12 years</td>
</tr>
<tr>
<td>Investment Margin - Department</td>
<td>$(102,500)</td>
<td>$(134,503)</td>
<td>$(43,722)</td>
<td>$(189,932)</td>
<td>$(290,280)</td>
<td>$(487,988)</td>
<td>$(556,212)</td>
<td>$(549,510)</td>
<td>$(534,037)</td>
<td>$(530,192)</td>
</tr>
</tbody>
</table>

### Instructions & Notes

- Data should be entered only in the cells shaded in green
- Incremental margin reflects new margin above prior year
- Program development costs should reflect the investment from campus and Division of Continuing Studies
- Marketing cost to acquire new students should be $3,000 or more.
University of Wisconsin- Madison  
Cost and Revenue Projections Narrative  
Master of Science in Clinical and Health Informatics  

**Introduction**

The proposed Master of Science in Clinical and Health Informatics (MS-CHI) is an entirely online program with courses offered in fall, spring, and summer. The program is designed for working professionals who have clinical or technical expertise working in a health care setting. Students can complete the program in two years if they are full time or in three years if they are part-time. Our expectation is that the majority or all of the students will be part-time students. The program is comprised of 30 credits and offers an interdisciplinary approach integrating courses from five schools and college: the School of Medicine and Public Health (SMPH), School of Pharmacy, College of Engineering, School of Nursing, and School of Business.

The MS-CHI will be supported by tuition revenue in keeping with the University of Wisconsin System online tuition policy (SYS 130 Appendix C: Principles for Pricing Distance Education Credit Courses, Degree and Certificate Programs). The Division of Continuing Studies (DCS) and Campus will provide seed funding for the first two years of the program. Within three years, the MS-CHI will be in a self-sustaining, revenue-positive position.

**Section I- Enrollment**

All of the students are expected to be enrolled as part-time students because the program is designed for working professionals, with few exceptions. The curriculum is offered in the fall, spring, and summer terms with continuous enrollment expected in each of the semesters. Students can expect to complete the program in two to three years. Annual enrollments after Year 1 include both continuing and new students. The average student retention rate is projected to be 95%, which is consistent with other professional degrees where the drop rate is minimal due to the part-time pacing of the program. The first year of enrollment is projected at 25 students with additional cohorts of 25 students per year. The enrollment goals is to have 75 new students four years after the program launch and continue to enroll 75 new students per year in subsequent years. The enrollment goals represent a conservative estimate of the enrollment, but there is not an enrollment limit.

**Section II- Credit Hours**

The program requires 30 credits, which consists of 11 required courses including a capstone course. Students, based on a part-time course load, are expected to take 4-6 credits per semester including summer term. Most students are expected to complete the program in 2-3 years. All except two of the courses are existing courses. Two new courses are being developed for the program. Course development costs in FY 2020 and 2021 reflect new course development and conversion of courses to an online format. Course development costs in the subsequent years reflect course maintenance/renewal of the online courses.

Students will typically enroll in six credits in the fall and spring semesters and 3-5 credits in the summer semester. We assume students will complete 12 credits per year, which is slightly more than the campus minimum, complete 95% of credits enrolled, and finish the degree in three years.
Section III - Faculty and Staff Appointments

The MS-CHI is an interdisciplinary program that will use existing courses (two new courses) and existing faculty/instructors based in the participating schools and colleges. The department chairs from each of the partnering programs will assign instructors for each course. With the exception of a full-time instructor/advisor for the MS-CHI, instructional costs are based on a revenue-sharing agreement with the deans of the partnering schools and colleges. The revenue-sharing agreements provide $600 per credit per student.

Instructional costs are calculated on a per credit basis and projected annually to be:

- Year 1: $20,000
- Year 2: $30,000
- Year 3: $40,000

Staff support will be as follows (costs include annual salary and fringe benefits):

- An academic director who will allocate 0.5 FTE to the academic director role at $175,568.
- A program director who will allocate 1.0 FTE to the program director role at $105,060.
- A program coordinator who will allocate 0.5 FTE to the program coordinator/student services coordinator role at $98,373.
- A support staff member who will allocate .25 FTE to the support staff role at $11,250.
- An instructor/advisor who will allocate 0.5 FTE to the instructor/advisor role at $53,724.
- A marketing relations specialist who will allocate 0.5 FTE to the marketing relations role at $52,291.

Section IV - Program Revenues

Tuition will generate program revenue for the MS-CHI. We propose an online tuition rate of $1,600/credit, which market evidence supports. The labor demand research, commissioned by the DCS, suggests that students are willing to pay for this degree and prefer the flexibility of an online modality while working and attending the program as a part-time student. Tuition revenues for new and continuing students is based on projected credit enrollment per student multiplied by the student head count. Tuition revenue is calculated by multiplying the number of credits per year by $1,600.

Section V - Program Expenses

In addition to faculty/instructional, administrative, and support staff, the program expenses include a 10% campus assessment on gross revenue. Program development costs attributable to start-up costs will be funded by the DCS and central campus. The continued maintenance and course renewal costs are included in the program development expenses and will be funded by the DCS. If new courses are added in subsequent years, the MS-CHI will fund those course development expenses. Marketing expenses will also be funded by the DCS until 2022 and then the expense will transition to the MS-CHI. Continuing program expenses for instructional and administrative staff will be funded through the MS-CHI. Course development costs totaling $259,250 for the first five years, which include instructional designer labor, stipend for the TeachOnline@UW program, and additional month of buy-out for faculty will be funded through DCS.

Section VI - Net Revenue
As a 131-program, we project that tuition revenue will fund our programs operational costs by calendar year ending 2023 and will provide a surplus of reinvestment revenue of $290,280 by the end of year 2023. By the end of Year 5, the program is projected to generate more than $487,988 in net revenue. The net revenue is a pool of funds for reinvestment. Planning for reinvestment of the margin will be overseen by ICTR leadership (Executive Directors) with input from partnering schools and colleges. The reinvestment pool will consider funding for professional development, which will include travel and attendance at conferences and workshops relevant to clinical and health informatics, the development of an alumni network, support for additional faculty lines, and pilot grant funding.
REQUEST FOR AUTHORIZATION TO IMPLEMENT A
MASTER OF SCIENCE
IN CLINICAL AND HEALTH INFORMATICS
AT UNIVERSITY OF WISCONSIN-MADISON

The University of Wisconsin-Madison proposes to establish a Master of Science in Clinical and Health Informatics (MS-CHI). The development of the program responds to the 2017 Leadership and Workforce study conducted by the research arm of the Healthcare Information and Management Systems Society (HIMSS) that found that 61% of healthcare organizations and vendors are expecting to expand their workforce in the upcoming few years.\(^7\)

The MS-CHI will provide students with an interdisciplinary approach with population health, biomedical informatics, industrial systems engineering, nursing, pharmacy, and healthcare operations management expertise. Graduates will possess a strong foundation in healthcare decision-making using informatics methods to create innovative solutions or improve current practices in health policy, clinical practice, security, and biomedical and health information systems.

The MS-CHI will serve working professionals in the healthcare industry through a fully-online curriculum. The program seeks to become Wisconsin’s first master’s program accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). The program will be comprised of 30 credits, which will include online, collaborative coursework for working professionals. Students are expected to have 3-5 years of clinical or information technology-related work experience, preferably in a health care setting, and should have a statistics background.

PROGRAM IDENTIFICATION

**Institution Name:** University of Wisconsin-Madison

**Title of Proposed Program:** Master of Science in Clinical and Health Informatics

**Degree/Major Designations:** Master of Science

**Mode of Delivery:** Single institution; 100% distance delivery

**Projected Enrollments and Graduates by Year 5**

Table 1 represents enrollment and graduation projections for students entering the program over the next five years. For the purposes of this estimate students are projected to be enrolled 15 credits each year (6 credits in the fall, 6 credits in the spring, 3 credits in the summer) and complete in two full years. However, some students may take credits at a slower pace for three-year completion. The retention rate is projected to be 95%, which is similar to other UW-Madison online programs for professional audiences. By the end of Year 5, an estimated 146

students will be enrolled annually and more than 150 students will have graduated from the program.

Table 1: Five-Year Degree Program Enrollment Projections

<table>
<thead>
<tr>
<th>Students/Year</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Students</td>
<td>25</td>
<td>50</td>
<td>50</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Continuing Students</td>
<td>0</td>
<td>24</td>
<td>48</td>
<td>48</td>
<td>71</td>
</tr>
<tr>
<td>Total Enrollment</td>
<td>25</td>
<td>74</td>
<td>98</td>
<td>123</td>
<td>146</td>
</tr>
<tr>
<td>Graduating</td>
<td>0</td>
<td>24</td>
<td>48</td>
<td>48</td>
<td>71</td>
</tr>
</tbody>
</table>

Tuition Structure
For students enrolled in the MS-CHI program, per-credit tuition of $1600 under the distance delivered pricing tuition policy (SYS 102) is proposed, which has been determined based on a market analysis of similar programs. The total annual tuition costs for the 30-credit hour program will be $48,000. No additional required fees will be charged.

Department or Functional Equivalent: Institute for Clinical and Translational Research

College, School, or Functional Equivalent: School of Medicine and Public Health

Proposed Date of Implementation: Fall 2020

DESCRIPTION OF PROGRAM

Overview of the Program
This 30-credit MS-CHI is designed as an entirely online program for working professionals. The program offers the flexibility to complete the program in 2-3 years on a part-time basis. The MS-CHI is focused on meeting the educational and professional development needs of two types of learners: (1) healthcare professionals who want to further their knowledge and training in health informatics and its use in clinical practice and healthcare operations, and (2) non-healthcare professionals seeking to gain knowledge about the healthcare system and the application of informatics in a healthcare setting to improve patient care and population health.

Student Learning Outcomes and Program Objectives
The MS-CHI program learning outcomes are based on the American Medical Informatics Association (AMIA) Health Informatics Core Competencies for the CAHIIM:
1. Health: Describe and explain background knowledge of the history, goals, methods and challenges of the major health sciences, including human biology, genomics, clinical and translational science, healthcare delivery, personal health and population health.
2. Information Science and Technology: Demonstrate background knowledge of concepts, terminology, methods and tools of information science and technology for managing and analyzing data, information and knowledge.
3. Social and Behavioral Science: Evaluate the effects of social, behavioral, legal, psychological, management, cognitive, and economic theories, methods, and models
applicable to health informatics from multiple levels including individual, social group, and society.

4. **Health Information Science and Technology**: Determine concepts and recognize tools for managing and analyzing biomedical and health data, information, and knowledge. Key foci include systems design and development, standards, integration, interoperability, and protection of biomedical and health information.

5. **Human Factors and Socio-technical Systems**: Apply social behavioral theories and human factors engineering to better understand the interaction between users and information technologies within the organizational, social, and physical contexts of their lives, and apply this understanding in information system design.

6. **Social and Behavioral Aspects of Health**: Evaluate and apply social determinants of health and patient-generated data to analyze problems arising from health or disease, to recognize the implications of these problems on daily activities, and to recognize and/or develop practical solutions to managing these problems.

7. **Social, Behavioral, and Information Science and Technology Applied to Health**: Appraise diverse foundation concepts and facets in order to develop integrative approaches to the design, implementation, and evaluation of health informatics solutions.

8. **Professionalism**: Demonstrate conduct that reflects the aims or qualities that characterize a professional person encompassing especially a defined body of knowledge and skills and their lifelong maintenance as well as adherence to an ethical code.

9. **Interprofessional Collaborative Practice**: Exhibit behavior that reflects the foundations of values/ethics, roles/responsibilities, interprofessional communication practices, and interprofessional teamwork for team-based practice.

10. **Leadership**: Demonstrates the following characteristics: credibility, honest, competence, ability to inspire, and ability to formulate and communicate a vision.

**Program Requirements and Curriculum**

Applicants must meet the minimum requirements of the University of Wisconsin-Madison Graduate School, which include an undergraduate degree with a GPA of 3.0 in the last 60-semester hour or a master’s degree with a minimum cumulative GPA of 3.00. Standardized entrance exams or scores are not required for admission into the program (i.e. GRE, GMAT, or other). Applicants must meet the following program requirements for admission:

- Focused area of interest in informatics, data analytics, clinical care, research, health information technology, or similar fields.
- Health professional degree or bachelor’s degree in information technology, statistics, computer science, or similar field.
- 3-5 years of clinical or information technology work experience, preferably in a healthcare setting.
- Completed a college-level statistics course or equivalent work.

The Faculty Admissions Committee, comprised of MS-CHI program faculty, will consider all aspects of each application.
Table 2: MS in Clinical and Health Informatics Program Curriculum

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Department/School or College</th>
<th>Number of Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POPHLTH 709 Translational and Outcomes Research in Health and Health Care</td>
<td>Department of Population Health Sciences /School of Medicine and Public Health (SMPH)</td>
<td>3 credits</td>
</tr>
<tr>
<td>PHM PRAC 617 Health System Pharmacy and Data Analysis and Informatics</td>
<td>School of Pharmacy</td>
<td>2 credits</td>
</tr>
<tr>
<td>EPD 706 Change Management</td>
<td>Engineering Professional Development/ School of Engineering</td>
<td>1 credit</td>
</tr>
<tr>
<td>POPHLTH 795 Principles of Population Health Science</td>
<td>Department of Population Health Sciences/ SMPH</td>
<td>3 credits</td>
</tr>
<tr>
<td>NURSING 772 Leadership and Organizational Decision Making in Health Care</td>
<td>School of Nursing</td>
<td>3 credits</td>
</tr>
<tr>
<td>I SY E 601 Special Topics: Human Factors Engineering for Healthcare Systems</td>
<td>Department of Industrial and Systems Engineering/ College of Engineering</td>
<td>3 credits</td>
</tr>
<tr>
<td>BMI 573 Foundations of Data-Driven Healthcare</td>
<td>Department of Biostatistics and Medical Informatics/ SMPH</td>
<td>3 credits</td>
</tr>
<tr>
<td>NURSING 702 Health Promotion and Disease Prevention</td>
<td>School of Nursing</td>
<td>3 credits</td>
</tr>
<tr>
<td>OTM 753 Healthcare Operations Management</td>
<td>Wisconsin School of Business</td>
<td>3 credits</td>
</tr>
<tr>
<td>NURSING 715 Evaluation of Health Informatics Solutions</td>
<td>School of Nursing</td>
<td>3 credits</td>
</tr>
<tr>
<td>BMI 750 Cumulative Capstone in Clinical and Health Informatics</td>
<td>Department of Biostatistics and Medical Informatics/ SMPH</td>
<td>3 credits</td>
</tr>
<tr>
<td><strong>Total credits</strong></td>
<td></td>
<td><strong>30 credits</strong></td>
</tr>
</tbody>
</table>

Assessment of Outcomes and Objectives

Indirect: A pre-degree survey will assess familiarity and prior experience with the learning outcomes. The Academic Director will work with the Division of Continuing Studies to conduct the pre- and post-survey indirect assessments. Similarly, a post-degree assessment will assess students’ self-reported level of preparation on each learning outcome. This will occur for every enrollment and graduation term to track student learning at the program level, learning goals and expectations, and how the program is preparing students for their degree goals/needs.

Direct: The MS-CHI Capstone course will be the primary source for direct assessment of student learning outcomes. In addition, the Capstone will conclude with final presentations that showcase student work and are evaluated by sponsoring industry partners, the capstone project stakeholders, the capstone project mentors, and other instructors for the program.

Comprehensive evaluations of the Capstone projects will occur at the end of the fall and spring semesters. In addition, formative assessments in the form of case study presentations, strategic planning, and decision-making across interprofessional teams will be evaluated. Feedback will be provided to the students. Due to the online-part-time learners expected to enroll
in this MS-CHI, the summative view of the learning outcomes will be assessed at the end of the program once per year within the Capstone, beginning Spring 2022.

The MS-CHI Academic Director will coordinate the implementation of the assessment plan annually and work with faculty and staff advisors to complete all direct assessments. Assessment data will be forwarded to the Steering Committee for evaluation and further dissemination.

The annual September Steering Committee meeting will review assessment results, compiled by the Student Services Coordinator. The Steering Committee will produce an assessment summary to be presented at the All Faculty Department meeting held early in the fall (usually scheduled in October) of each academic year.

After reviewing the assessment summary and comments from the All Faculty Department meeting, the MS-CHI Steering Committee will decide which, if any, items are actionable. The Executive will provide a report of those plans and the assessment summary to the Office of the Provost.

Any actionable items will be discussed during Steering Committee meetings held in late fall of the semester. Proposals will be developed and follow governance steps at that time. If approved, any curricular/programmatic/co-curricular changes will be implemented by the following summer semester. The MS-CHI Academic Director will monitor all new implementations annually, with a more comprehensive report being compiled during the appropriate student learning outcome assessment year (within the 3-year timeline).

Additional Assessment Measures: Student evaluations of teachers and classes are an important source of program assessment data, which can inform program and course design, instructional strategies, and program improvement.

During the implementation phase, the MS-CHI will also carefully monitor student access to courses to ensure growth of course capacity meet student demand, as well as student engagement and success to inform program, course, and instructional design.

**Diversity**

The MS-CHI advances curriculum excellence to promote diversity and equity in the following ways:

1. Disease prevention efforts as well as access to care in our nation’s hospitals and clinics can vary greatly in different populations groups; resulting in health disparities that impact the health status of vulnerable populations. The MS-CHI curriculum poses several questions across courses to critically analyze why outcomes vary so greatly by socio-economics, race, ethnicity and gender, education, age and other social determinants.

2. Data-driven health care will examine patient care across a variety of variables to analyze cost-effective measures to improve data driven decision-making to support the equitable distribution of resources.

3. Across the curriculum, social determinants of health and patient-generated data are used to analyze complex problems, support integrative solutions, and design and implement health informatics solutions across healthcare institutions and patient populations.

4. Human factors engineering skills are developed to support better understanding of the interaction between users and information technology so that organizational, social, and physical contexts are principles of good design and implementation.

5. Ethical and professional conduct are critical components of the MS-CHI and to highlight the necessity to protect biomedical and health information across all users.
The MS-CHI focuses on the professional and ethical conduct, leadership development, interprofessional teamwork, and organizational decision-making skills that ensure the ethical use of data to support the health outcomes of all people across the lifespans.

The MS-CHI will actively pursue equity in student recruitment, access, and retention by working closely with the Graduate School and the Division of Continuing Studies marketing and recruitment teams to make sure students who represent all forms of diversity including socio-economic, gender, sexuality, race, ethnicity and religion are recruited. Marketing materials and content will show a diverse student body. Graduating students will share insights about the program with interviews, videos, and testimonials about their program experience working in interprofessional collaborative teams to solve real health care problems and interact with professionals who have varied experience and backgrounds.

By offering flexible schedules and removing geographic boundaries, online graduate and professional programs, such as the MS-CHI, increase access for non-traditional learners. The MS-CHI is targeted to working professionals that represent a range geographic areas, experiences, and backgrounds; adding to the richness and overall diversity of the student population as well as the student experience.

As a degree that promotes public health, recruiting students who represent the diverse needs in healthcare delivery, data driven medicine and data informatics is the goal. Efforts will be made to develop relationships at conferences, networking events, and clinical settings that support the diversity efforts and goals of the program. Moreover, once the program has program revenue resources, scholarships targeted at underrepresented groups will be awarded to promote gaps within the diversity and equity goals of the program.

Academic support is essential for the retention and success of all students. Academic support services for the MS-CHI will be designed to meet the needs of a diverse, adult student population. The Academic Director and Student Services Coordinator will be the primary contacts for all students and will help support advising as well as both academic and career resources for all learners. An online Community of Practice will provide program resources, tutoring support, peer to peer sharing, and goal setting strategies for career success. The Community of Practice will offer an inclusive, virtual environment where students from diverse backgrounds will interact and build a community of learners around common academic and professional interests. These can be shared openly with all students enrolled in the program. Webinars targeting stress, work-life balance, career exploration, and effective time management and organization will be shared along with UW resources that can support and guide professional development. All students will have a faculty mentor in the program to guide and support individualized needs and goals.

While the program does intend to support the hiring of new faculty in participating departments, it does not anticipate adding a significant number of faculty or staff. The program will be committed to recruiting culturally diverse faculty, lecturers, and staff.

**Collaborative Nature of the Program**

The MS-CHI leverages cross-disciplinary expertise across five schools including the Schools of Medicine and Public Health, Nursing, Pharmacy, and Business, and the College of Engineering that are contributing courses. There are no collaborations with other University of Wisconsin Schools or Colleges for this program.

**Projected Time to Degree**

Based on market research most students will work and attend the program part-time and take an average of 4-6 courses per year. At this rate, the majority of students will complete the
program in 2-3 years. Students will only be able to enter the program in the fall and will take courses in sequence. The Capstone course can only be taken in the final semester of study. The Capstone course will initially be offered in the Year 2 of the program and subsequently be offered annually to accommodate students on both a 2-year and 3-year cycle.

**Program Review**

The MS-CHI will follow the Academic Program Review Guidelines established for all new UW-Madison graduate programs. Three years following program implementation, MS-CHI will complete a Three-Year Check-In document that will be reviewed by the Graduate Faculty Executive Committee. A full program review will be conducted five years after implementation. Subsequently, the program will be reviewed at least once every ten years. The MS-CHI Steering Committee will review and recommendations of these periodic reviews and will work with the Academic Director and participating department chairs to implement the changes resulting from these recommendations.

**Accreditation**

This program will seek accreditation to support the mission and vision of next generation of informatics professionals. The CAHIIM guidelines for accreditation require that a program does not apply earlier than six months before the first graduating class. The target date for applying for accreditation for the MS-CHI will be the Spring Semester of Year 3. The CAHIIM accreditation process will take 1-2 years from the time of first application for consideration, through candidacy, a self-assessment, a site visit, and final determination.

**JUSTIFICATION**

**Rationale and Relation to Mission**

The Institute for Clinical and Translational Research (ICTR), where this program will be housed, is interdisciplinary (and interdepartmental) by design. ICTR is housed within the SMPH and partners closely with the Schools of Nursing, Veterinary Medicine, and Pharmacy, and the College of Engineering. The overarching mission of MS-CHI is to offer ICTR members and partners throughout the entire institution, as well as external professionals in the region, to translate best practices in applied clinical informatics to improve clinical care. This program is poised to be a leader in clinical and health informatics with a proven record of accelerating research into applied outcomes to improve health in the United States. This program will utilize the expertise of faculty across the university to fill a growing need to leverage informatics expertise in the healthcare space where evidence-based, data-informed care are essential. Students will graduate from MS-CHI with skills to enhance their professional practices in the clinical healthcare setting and as business and informatics leaders; drawing from operational and healthcare management, health informatics, and information technology skills to solve complex problems of the social-behavioral aspects of health. This new degree is part of SMPH’s strategic vision and planning mission, creating vital connections between basic discovery and clinical/translational research, and providing programs that support the health and wellness of individuals and populations.

This program also supports the UW-Madison campus strategic framework goal to improve access (through online delivery) and “build innovative professional master’s-level degrees and other lifelong learning experiences.”

**Institutional Program Array**
There are a number of programs offered at UW-Madison and within the University of Wisconsin system that offer related content, but do not have a CAHIIM accredited, online program for adult learners.

UW-Madison offers an M.S. in Biomedical Data Science. This program prepares graduates to understand key concepts and methodologies from computer sciences and statistics to contribute to the solutions central to computational problems in biomedicine. This program is face-to-face and is for students interested in data structures and algorithms with a strong aptitude for math and computer science. The program is research- and thesis-based and designed for students interested in building algorithms and simulations for population health research, statistical genetics, and biomedical informatics.

Additionally, the M.S. in Statistics named option in Biostatistics at UW-Madison serves students who work in the theory, methodology, and application of statistics. This program focuses primarily on the statistics of biomedical sciences and differs from informatics in that it focuses on the computation and mathematical application of how to design experiments and survey samples in the biomedical field.

Informatics, in contrast to biomedical data science and statistics, focuses on the interaction between humans and information. Informatics as a field is a branch of information engineering and is about information systems and how they interface with organizations, technologies, systems and statistics as a subfield. However, informatics as a whole is much more inclusive to the study of the social aspects of how information technologies are applied in the healthcare space. MS-CHI also differs in that receiving accreditation from CAHIIM, which incorporates the AMIA accreditation standards for master’s degree programs in health informatics, is a strategic priority for the program. In addition, all courses are offered online for working healthcare professionals and are focused primarily on the application and applied tools used in a clinical or healthcare setting. MS-CHI does not offer a thesis option and works with the applied skills needed to translate data science into workable processes at the healthcare system level.

There is a growing need for a clinical healthcare focus for leaders and managers to use informatics to solve complex healthcare problems. This is part of the SMPH’s strategic vision and planning mission to create vital connections between basic discovery and clinical/translational research. The overarching goal for MS-CHI is to create strategic programing and research partnerships that improve public health by translating basic research discoveries into direct, practical improvements in clinical care and healthcare delivery systems.

Other Programs in the University of Wisconsin System

Currently, there is just one graduate-level health science related degree and two certificates within the UW System in this domain. These UW System programs serve students interested in learning skills related to IT management within a healthcare setting.

UW-Milwaukee offers a Masters in Health Care Informatics and a Certificate in Health Care Informatics. The UW-Milwaukee master’s degree focuses on the automation of medical data and information and closely aligns with IT network design rather than clinical decision-making. The courses are face-to-face and online for working IT professionals. The Certificate in Health Care Informatics is offered as a cooperative program among the College of Health Sciences, the Department of Health Informatics Administration, and the School of Information Studies. The certificate allows students to explore the three disciples to build foundational knowledge across fields. According to the program website neither the degree nor the certificate is accredited.
The University of Wisconsin-Oshkosh offers a Healthcare Informatics Certificate. The program serves healthcare nurses interested in integrating computer science and information science to improve patient outcomes. The program is online with a required clinical practicum. Because the program serves nurses, this certificate allows students to be eligible to take the American Nursing Credentialing Center (ANCC) Informatics Nursing Certification exam.

As potentially the only CAHIIM accredited master’s program in Wisconsin, the proposed program will serve a different audience including healthcare professionals with clinical or information technology experience interested in managing healthcare enterprise solutions and implementing system-based solutions to improve patient outcomes. Students are required to have work experience in clinical healthcare or an information technology/management area. They are also required to have a degree in a clinical discipline (M.D., R.N., PharmD, etc.) or a degree in information technology (other areas such as computer science, statistics, etc. will also be considered) and proficiency with basic statistics.

Need as Suggested by Current Student Demand

The MS-CHI will serve an audience outside of the traditional school structure, offering all courses online and providing the flexibility of completing the program on a part-time basis. Prospective students will include health care professionals and information technology professionals with a strong interest and/or background in health care informatics, data analytics, clinical care or research, and health information technology. Trends in academic programs for non-traditional students at University of Wisconsin-Madison demonstrate the demand for degree-granting programs for this student population with continual increases in the number of programs, enrollment, and student credit hours from 2009-2018. Similarly, distance education course enrollments for graduate and clinical degrees increased by 46.6% over the same period.8

Market research conducted by the Division of Continuing Studies (DCS) determined that there was a strong demand for an online professional master’s degree in the field of clinical and health informatics. The fact that the MS-CHI will prioritize CAHIIM accreditation which will be a significant differentiator among similar degrees. DCS also determined that given the labor demand for individuals with graduate training in clinical and health informatics students are willing to pay the $1600 per credit for this degree and prefer the flexibility of an online degree modality while working and attending to the degree as a part-time student.

Need as Suggested by Market Demand

The 2017 Leadership and Workforce study conducted by the research arm of the HIMSS found that 61% of healthcare organizations and vendors are expecting to increase hiring in the upcoming few years.9 Epic, a Wisconsin-based company, now works with over 50 IT vendors seeking health informatics specialists in over 20 states. In Wisconsin alone that year, more than 900 job postings were looking for people with 3-5 years of clinical experience and a master’s in a data field.

Additionally, informational technology and healthcare clinical informatics is a growing field with more than 900 job postings in Wisconsin alone looking for a person with 3 to 5 years of clinical experience and a masters in data analytics.10 Local employers include Deloitte,
General Electric, Vital Tech solutions, UW Health and Epic. According to the Department of Labor and Bureau of Labor Statistics, healthcare will produce more new IT jobs through 2020 than any other industry, with a projected increase of 21%.

Because of these growing trends and opportunities in healthcare and informatics, many major universities are creating program offerings and certificates. The University of Illinois at Chicago has recently created a Master of Science in Health Informatics and a Post-Master’s Certificate in Health Informatics. Other institutions with health informatics programming include University of Cincinnati, Northwestern University-Feinberg School of Medicine, Johns Hopkins University, University of Texas, and the University of Washington School of Nursing and School of Medicine.

Expertise in clinical and health informatics is also required in the top tier of job openings that involve electronic health record analysis, database design and clinical operational management, health modeling, and health care data security AMIA reports that the average salary among all its members is $181,174. The market demand according to the Educational Advisory Board Report on Health Professions saw a national demand of over 35,000 job postings in 2016 asking for the informatics skills. Moreover, healthcare has even greater data integration, system interoperability, and reporting needs than ever before and healthcare clinical informatics skills are required to demonstrate outcomes for Medicare reimbursement and reform. The demand for these skills is driving new online programming ac across the country. UW-Madison is poised to become a leader in this space. Within the integrated School of Medicine and Public Health, ICTR is the home to the Clinical and Health Informatics Institute (CHI), which is designed to foster applied clinical health informatics activities. ICTR provides links to the Schools of Nursing, Veterinary Medicine, and Pharmacy, the College of Engineering and Department of Biostatistics and Medical Informatics. The timing is right as health care employers are actively seeking analytics in informaticists with a 37% increase in informatics jobs stipulating data analytics skills from 2013-2016. The overall projected growth in the healthcare analytics market from 2015-2020 is over 11 billion with four out five hospital systems citing value-base care as a key analytical driver. The need for data skills are increasingly becoming a necessity in the healthcare industry.

Locally, there are several potential employers for program graduates. Local employers include Deloitte, General Electric, Vital Tech Solutions, UW Health, and Epic. Recent job titles for careers in clinical healthcare informatics include Medical Informatics Project Directors, Researchers, Systems Analysts, Clinical Informatics Directors, Specialists, Coordinators, and Analysts. Conversations between Epic staff and MS-CHI development team members indicated that there was interest in the online MS-CHI. Epic staff suggested the degree would be a good fit for employees that need to work in a clinical setting, leadership teams that use health informatics for decision-making, and technical service teams that provide customer support.

The University of Wisconsin-Madison will leverage the institution’s cutting-edge work in the School of Medicine and Public Health, where medical and population health research already


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have a strong record to inform best practices in the clinical setting to develop and offer a M.S. in Clinical and Health Informatics that will meet the growing demand for clinical and health informatics professionals who will contribute to the quality and delivery of healthcare.