June 26, 2019

TO: Members of the Board of Trustees

FROM: John A. Elliott
       Interim Provost and Executive Vice President for Academic Affairs

RE: Certificate in Clinical Genetics and Genomics

RECOMMENDATION:

That the Board of Trustees approve the Certificate in Clinical Genetics and Genomics in the Institute for Systems Genomics.

BACKGROUND:

The expansion of new diagnostic modalities, increasing numbers of genetic tests available, and the shift toward individualized medicine means an expanding role for many in the clinical health care field. Given the shortage of trained genetic counselors and medical geneticists, physicians, nurses and laboratorians are consulted for test ordering and result interpretation. Also, the popularity of at-home DNA testing combined with the personalized medicine trend brings with it an increasing interest to work in this dynamic field. Transitioning to this specialized career requires foundational knowledge and familiarly with normal and abnormal genetic disease states, basic applications of genetic and genomic testing, and ethical considerations in all scenarios, all of which would be provided in the Certificate in Clinical Genetics and Genomics.

The Certificate in Clinical Genetics and Genomics will provide baseline of knowledge for non-traditional students, students switching careers, or working professionals who cannot dedicate the time for a full degree. Individuals who earn this certificate will be poised to advance in a current position, pursue additional graduate training, or seek a new entry level career in this dynamic field of study. Additionally, the establishment of this graduate certificate program such as this may help to address a genetic counseling workforce shortage given that graduates will be eligible and highly competitive for genetic counseling assistant positions.
Request for New UConn Certificate Program

Program information
Name of certificate program: Clinical Genetics and Genomics
Name of sponsoring department: Institute for Systems Genomics
Name of Department Head: Dr. Rachel O'Neill
Name of sponsoring College: N/A
Director of certificate program: Maria E. Gyure, MS, LCGC
Type of certificate: Graduate, Fee-Based, Online
CIP Code: 26.0806 (Human/Medical Genetics)
Projected annual enrollments: 10 Students Per Year

Program outline and description of program learning outcomes
The expansion of new diagnostic modalities, increasing numbers of genetic tests available, and the shift toward individualized medicine means an expanding role for many in the clinical health care field. Given the shortage of trained genetic counselors and medical geneticists, physicians, nurses and laboratorians are consulted for test ordering and result interpretation. The popularity of at-home DNA testing combined with the personalized medicine trend brings with it an increasing interest to work in this dynamic field. However, transitioning to this specialized career requires foundational knowledge and familiarity with normal and abnormal genetic disease states, basic applications of genetic and genomic testing, and ethical considerations in all scenarios. A graduate certificate is an excellent modality to provide a baseline of knowledge for non-traditional students, students switching careers, or working professionals who cannot dedicate the time for a full degree. For those who are interested in a MS degree in genetics, genomics or genetic counseling, but lack prior course work, relevant training, or require a probationary admit status, the University does not offer foundational courses in genetics, genomics, or clinical medicine. The establishment of a graduate certificate program such as this may help to address a genetic counseling workforce shortage given that graduates will be eligible and highly competitive for genetic counseling assistant positions.

The translation of genetics and genomics toward personalized health care drives a need for new service delivery methods including telemedicine and social media, as well as for qualified professionals in genetic counseling, laboratory testing and research, specialized clinics, advocacy groups, and more. The UConn Online Graduate Certificate program is designed to provide students with an independent, yet engaging curriculum toward the goal of acquiring a knowledge base and skill set in clinical genetics and genomics, while interweaving ethical considerations throughout all courses. Graduates will be poised to advance in a current position, pursue additional graduate training, or seek a new entry level career in this dynamic field of study.
Programmatic goals include providing students with a broad foundation of knowledge in the field of clinical genetics and genomics along with an introduction to current technologies and techniques utilized within the field.

**Describe similar programs nationally, regionally, or in Connecticut.**

Graduate certificates in genetics/genomics currently exist and models similar to this proposed certificate can be found within institutions such as the University of Florida, Stanford University and Regis College. The program at the University of FL is housed in their College of Pharmacy and differs due to a significant emphasis on pharmacogenetics, epidemiology, and also includes a capstone project. Courses are online but span twelve weeks and are not always asynchronous. Completion of the Univ of Florida program typically takes greater than one year. Stanford University’s graduate certificate in Genetics and Genomics requires six courses, however we perceive the content to be less in depth because each course takes only 10-18 total hours to complete. The Stanford program also requires that learners have at least five years of work experience (preferably in a science or tech field) prior to matriculation. Regis College offers a graduate certificate with a focus on Biomedical Genetics and Genomics. However, like many other certificate programs, Regis College requires learners to be onsite. Based on our evaluations of other program offerings across the state and country, the University of Connecticut stands well-positioned to be at the forefront of online education in the arena of clinical genetics and genomics by adding this graduate certificate to its list of offerings. The UConn graduate certificate will provide for increased literacy and provides economic and career utility as well.

With an online course format that is flexible, in-depth, and open to a variety of learners, the UConn Clinical Genetics and Genomics Graduate Certificate program is predicted to draw great interest from the community at large. To date, the Program Director has received inquiries from current UConn students seeking post-graduation educational opportunities that will better prepare them for MS/PhD programs in the field of genetics and genomics. Additionally, current employees of research and commercial industries have reached out looking for training to better translate laboratory testing knowledge to patients and the lay community.

**Describe the program learning outcomes (upon successful completion of the program, students will be able to...)**

Upon successful completion of this program, students will be able to:

1) Apply theoretical and practical knowledge for the benefit of connecting clinical genetics and genomics to its consumers

2) Demonstrate the application of professional ethics, judgement and decision making in a clinical context

3) Identify and interpret genetic and genomic testing methods within a diagnostic context

4) Demonstrate a working knowledge of the genetic and genomic mechanisms underlying development and specific malformations of clinical significance
Curriculum information
Total number of credits required: 12 (4, 3-credit courses)

Required courses
List the course number, title, and number of credits for each required course in the program.
ISG 5100 Foundations of Clinical Genetics and Genomics (3 credits)
ISG 5101 Principles of Human Embryology (3 credits)
ISG 5102 Clinical Applications of Genetic and genomic Technologies (3 credits)
ISG 5103 Theories and Practice of Clinical Genetics (3 credits)

Elective courses
List the course number, title, and number of credits for each elective course in the program.
There are no elective courses.

Detailed course information

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<th>course</th>
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<td>ISG 5100</td>
<td>Maria Gyure, MS, LCGC</td>
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Program evaluation
The program will be evaluated through a combination of indicators:

The Clinical Genetics and Genomics certificate program is an educational initiative from the Institute for Systems Genomics, and in this capacity, will receive oversight and administrative support from the ISG as well as the School of Medicine. All graduate programs at UConn (both master’s and doctoral, except Law, Medicine, and Dental Medicine) formally report to the Dean of the Graduate School. The academic policies and procedures that govern the Graduate School will apply to the proposed graduate certificate as well, including admission requirements, general academic requirements, graduation requirements, and program review policies. The program will follow University-wide assessment policies for graduate programs. Alumni surveys will be distributed every five years. Recommendations from reviews and assessments will be used to make programmatic and curriculum improvements.

Financial resources
The ISG Clinical Genetics and Genomics certificate program will be an entrepreneurial program implemented using existing faculty resources and the hire of one or two adjunct faculty members. We expect that this investment and the new Program will yield significant benefits for the education of graduate students at the University.
Facilities/Equipment/Library/Special resources
All facilities and equipment are currently available in the Institute for Systems Genomics. Capital request grant and/or tuition return funds will be sought for any future needs (none anticipated at this time). Students will require access to online library resources.