Executive Summary

Graduate Specialization in Bioinformatics (Joint/Collaborative)
Cyclical review for 2014-2015

Approved by:
Ottawa-Carleton Committee on Graduate Quality Assurance (OCCGQA)
Carleton University Committee on Quality Assurance (CUCQA)
University of Ottawa Graduate Program Evaluation Committee (GPEC)

Name of Program Reviewed	Bioinformatics (Joint/Collaborative)
Degrees	At the University of Ottawa • Master of Science – Biochemistry, Specialization in Bioinformatics • Master of Science – Biology, Specialization in Bioinformatics • Master of Science – Microbiology and Immunology, Specialization in Bioinformatics • Master of Science – Cellular and Molecular Medicine, Specialization in Bioinformatics • Master of Science – Mathematics, Specialization in Bioinformatics • Master of Computer – Science, Specialization in Bioinformatics At Carleton University • MSc – Biology with Specialization in Bioinformatics • MSc – Mathematics with Specialization in Bioinformatics • Master of Computer Science with Specialization in Bioinformatics
Responsible academic units	• Ottawa-Carleton Institute of Biology (OCIB) • Ottawa-Carleton Institute of Computer Science (OCICS) • Ottawa-Carleton Institute of Mathematics and Statistics (OCIMS) • Department of Cellular and Molecular Medicine (CMM), Faculty of Medicine, University of Ottawa • Department of Biochemistry, Immunology and Microbiology (BIM), Faculty of Medicine, University of Ottawa
Final Evaluation	Good quality, with report due June 30, 2017
Program Start Date	2008

Strengths of the Program

The graduate Specialization in Bioinformatics (MSc, MCS) (Joint/Collaborative) is judged by the OCCGQA to be Good Quality, with report. The overall assessment of the specialization is positive.

One of very few master's level specializations in Canada dedicated to bioinformatics, this program augments the research and training available to students through the five individual supporting academic units, allowing the students to integrate the knowledge and skills of their different disciplines

(e.g., biology, medicine, mathematics, computer science) to address biological issues from a computational perspective, which often integrates "big data" techniques (statistical approaches).

Joint events such as symposia and poster days as well as joint courses and a virtual community provide opportunities for students and faculty members to benefit from the complementary expertise found at the two universities. In addition, the diversity of the participating units allows the program to remain flexible and to keep pace with new developments in the rapidly evolving field of bioinformatics.

Students express strong support for the training received as part of the specialization, and they demonstrate a good track record for publications in a diverse range of high-profile peer-reviewed journals in fields that intersect with bioinformatics. Additionally, many students from the specialization go on to do doctoral studies.

Areas for improvement and enhancement

A number of possibilities for enhancing the specialization in bioinformatics were identified.

The desire of students to transfer to doctoral programs means that they must drop the specialization, which is available only at the master's level. Extending the specialization to the PhD level would allow transfer students to remain in and benefit from specialized training in bioinformatics.

Biomedical engineering is an active area of research and development that would fit very well with the bioinformatics specialization. Currently, the Ottawa-Carleton Institute for Biomedical Engineering (OCIBME) is exploring becoming a participating member in the specialization. Such an extension would be welcome, as it would allow students from the biomedical field who have an interest in bioinformatics to take advantage of the specialization.

For some time, the core courses on the specialization (BNF 5106 and BNF 6001) have been taught by a single professor. To expose students to a more diverse offering, and to ensure that the absence of this professor (e.g., during sabbatical leave), would not adversely affect the delivery of the program. It would therefore be desirable to identify other professors who could contribute to the delivery of these BNF courses.

It challenging at times to achieve a sense of community because members are spread over three different campuses (University of Ottawa's main campus, University of Ottawa's medical campus and Carleton University's campus). Virtual tools, such as a LISTSERVE and website, help somewhat to mitigate this, but there is scope to do more in the way of community building, such as trying to couple specialization events with events organized by the participating units.

Recommendations

It is recommended that the bioinformatics program:

1. Seek to formally include OCIBME as a participating academic unit
2. Seek to extend the specialization to the doctoral level
3. Identify a broader range of professors able and willing to teach the core specialization courses (BNF 5106 and BNF 6001)
4. Continue to look for ways to build a sense of community, perhaps by piggy-backing on more events organized by the participating academic units

5. Identify ways to further raise the visibility of the specialization within the participating academic units

Implementation Plan

Calendar and Deadlines
A report addressing recommendations 1 to 3 should be submitted by June 30, 2017. The remaining recommendations should be addressed before the next cyclical review, to be carried out no later than 2022-2023.

Authorities
The bioinformatics coordinators will be responsible for the implementation of these recommendations, with the assistance of the heads of OCIB, OCICS, OCIMS and the CMM and BIM departments, who together with the deans of the science, engineering and medicine faculties will oversee the application and implementation of the recommendations in their respective institutions.