March 10, 2023

Faculty of Biology, Medicine, and Health

The University of Manchester

RE: Online PG Cert Course in Clinical Bioinformatics

Course Unit 3 - Introduction to Programming (Unit code: IIDS60120)

Instructor: Dr. Peter Freeman

To Whom It May Concern:

I am currently enrolled at the University of Manchester as a student in the Online Postgraduate Certification Course in Clinical Bioinformatics. I am writing to provide feedback on Unit 3 of this course, which is entitled “Introduction to Programming”.

I recently completed this course unit from November 2022 through February 2023 under the direction of Dr. Peter Freeman. My understanding from Dr. Freeman is that this particular unit is scheduled to be offered only once more (during the 2023-2024 academic year), at which point it is in jeopardy of being discontinued. Having benefitted greatly from my learning experience, I wanted to write this letter to show my support for continuing to offer this course unit in the future.

Some information about my personal background may be of assistance. I am a pediatrician and clinical geneticist living in the United States, and in July 2021 I stepped down from Medical Genetics practice after having worked directly in the diagnosis and care of individuals with genetic disorders for more than 20 years. At that time, I was looking to make a career shift, but I was not sure of an exact direction in which to go. Ultimately, it became clear to me that in order to best position myself to continue making an impact in the field of Medical Genetics and Genomics, I needed to gain skills in Bioinformatics and learn how to apply these skills.

While I have not yet completed the entire PG Cert course (I am currently in the early stages of taking the fourth and final unit), I certainly feel that the Introduction to Programming unit proved to be a critically important component of the course for me personally. Coming into the course as a neophyte in Clinical Bioinformatics, I was pleased to have at least some basic familiarity with the material being covered in course units 1, 2, and 4. However, I had no prior knowledge or understanding of the concepts and skills covered in Unit 3, nor did I realize how complementary they are to the practical application of the knowledge gained from the other course units.

For instance, I found it extremely helpful to learn about the Agile method of software development, which is obviously well known to professional programmers but was completely foreign to me prior to taking Unit 3. This method of iterative development based on user requirements and user feedback was certainly not taught as part of my previous graduate or postgraduate medical education, nor did I ever come across it as a practicing clinical geneticist. Learning how to approach problem solving with this type of mindset has given me new insights on how I might combine my existing knowledge as a clinical geneticist with my newly acquired skills in Bioinformatics to impact patient care.

I also greatly enjoyed learning a “real world” approach to programming. Having Dr. Freeman as an instructor reminded me of an undergraduate art course on drawing that I had taken many years ago. This course was taught by a professional artist, who was able to provide not only a big picture view of how to draw, but also a very practical hands-on approach to the students who were eager to develop some drawing skills themselves. In a similar fashion, I felt that Dr. Freeman’s approach to Unit 3 helped me learn the following: (a) the theories and concepts central to successful programming (such as designing the appropriate virtual machine and coding environment, repurposing open source code created by others, accessing APIs, following coding standards, and applying troubleshooting procedures), (b) the tools and platforms that are commonly used by programmers (including Linux, Python, Pycharm, Jupyter Notebooks, and GitHub), and (c) practical experience with using these tools and platforms in order to begin mastering the skills required of an effective programmer.

Perhaps most important, the course unit was collaborative in its design, so that the students could interact with Dr. Freeman and one another via the Slack platform, live Zoom tutorials, and the online course repository in GitHub. This helped me learn the value of collaboration as a way to efficiently access existing resources and solve complex problems using computer-based methodologies.

Finally, my experience during Unit 3 had an unexpected personal benefit, because it opened up new opportunities to bond with my eldest son. He had previously learned how to write Python code on his own, and programming has supplanted rock climbing as his favorite hobby. My son’s enthusiasm about my efforts to learn Python programming led him to create exercises for me to enhance my learning during the course unit, introduce me to his friends who are software developers, and even invite me to participate in a “hack night” group in which amateur and professional developers come together to share ideas and solve problems in a collaborative way.

Being far along in my professional career, it has been inspirational for me to connect with a younger generation of enthusiastic programmers who are leveraging data science and computer coding to efficiently accomplish complicated tasks and answer complex questions. Of note, while taking Unit 3, I was simultaneously working to update a medical genetics textbook chapter that I had previously co-authored almost 10 years ago. With my newly acquired knowledge of programming, I asked my son for help in creating a Python-based tool that could help expedite my review of the updated medical literature, and I was actually able to implement this tool in the preparation of the chapter. He and I are now working together on the development of a clinical decision support tool for genetics clinicians, and I credit the course unit for inspiring me to think of the idea behind this tool and find the confidence to co-design it with my son.

I hope that I have been able to provide some helpful perspective that can be taken into consideration as decisions are made regarding future offerings of the Introduction to Programming course unit. Please feel free to contact me with any questions with which I can help.

Sincerely yours,



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