Memo for Second Year 2 SSLC Meeting

Date and Time: 15th January 2025

1. Actions for Our Data Science Community

A. **TB1 Post Exam Survey:** Similar to the survey conducted last academic year, we conducted a TB1 post-exam survey among all Year 2 Data Science students, focusing on their thoughts regarding the exam and whether the support provided by the university was sufficient for exam preparation. We are pleased to note that the survey achieved a good response rate (52.54%), and we observed that most students expressed concerns about how the new Academic Year structure and the note removal policy have impacted them. These concerns will be discussed and followed up on in the future.

B. **Meeting with the Director of UG Studies:** Since Data Science is a brand-new cohort, we are aware of issues including the overall teaching arrangements for newly established courses, the choices of Year 3 electives, and the development of the Data Science community. During TB2 preparation week, we had a meeting with Arne to exchange ideas on these topics. We will follow up by proposing additional elective options for Year 3 students and suggesting volunteering opportunities to relevant staff before February.

2. Concerns about the Course Arrangements

TB1 Term Evaluation

Since we are at the beginning of TB2, it is worthwhile to conduct an overall evaluation of the TB1 course. While students are satisfied with the course arrangement for Statistics 2, However, students have experienced difficulties in the Algorithm and programming courses, and the problem is worsened due to the drastic change of learning pace due to the implementation of various new school practice, including the new Structure of Academic Year and the removal of notes policy.

Apart from the overall comments, the following paragraphs will address specific topics that are worthwhile to discuss:

A. Arrangements on Algorithm and Machine Learning

This is a relatively new course designed specifically for Year 2 Data Science students, but issues related to both course content and teaching support have arisen.

In terms of course content, the course focuses on various key concepts, including how to think programmatically by understanding the mechanisms of different algorithms and using mathematical concepts and proofs to analyse these algorithms, such as their time complexity, correctness, bounds, and efficiency. However, the breadth of these topics is too extensive to be covered within one term, which has

hindered the teaching quality. For example, the course could only allocate 2.5 weeks to cover seven topics related to Greedy Algorithms (such as SVD, and QR Decomposition) and Iterative Methods (such as Gradient Descent, Logistic Regression, and Power Iteration), forcing the lecturer to rush through the material without using examples to demonstrate different theories. This, combined with the lack of supplementary exercises on these complex topics, has left students with limited opportunities to consolidate their learning, which has seriously impacted their exam performance.

In the future, additional exercises should be provided to help students strengthen their mathematical understanding in Machine Learning. Moreover, a comprehensive review of the course content is necessary to ensure that students can explore mathematical problems in greater depth, rather than rushing through too many topics in a limited time frame.

B. Impacts of the Newly Adopted School Policies on the Learning Environment

The School of Mathematics and the university had implemented several new practices in the 2024/25 academic calendar, including the new Structure of the Academic Year (SAY) arrangements, the removal of notes for exams and the implementation of a new calculator policy, which have significantly impacted students' learning experiences and academic performance:

- With regards to the calculator policy, students reported minimal impact, as the School and Course Directors provided sufficient reminders before the exams.

- However, the exam note removal policy has had varied impacts, **depending on the usefulness and relevance of the exam notes** provided for different courses. For example, most students agreed that the notes for Statistics 2 were helpful, such practice did not significantly affect exam preparation. In contrast, students reported frustrations with the notes provided for Algorithms and Machine Learning courses, as the formula sheets contained errors, were irrelevant to the exams, and were generally unhelpful, leaving them feeling disadvantaged.

- At the same time, students have expressed mixed feelings about the new SAY schedule: Due to the hectic TB1 schedule, they felt there was inadequate preparation time to fully grasp critical concepts taught, especially contents during Weeks 10 and 11. In contrast, they appreciated the benefits of the structure e.g the free winter break and the TB2 preparation week, as they believe these changes offer greater flexibility in planning their academic workload for TB2.

- The impacts of the School's new practices on TB1 will be further discussed in the upcoming FSSLC meeting. **Currently, the university and the SU will conduct a survey regarding the new SAY arrangements. Once the survey is released, we encourage the other student reps to actively promote the survey to gather comprehensive feedback from students.**

The table in below provides overall comments on the teaching quality and course arrangements for each course, along with suggestions:

Courses	Teaching Arrangements and Teaching Quality	Course Contents	Suggestions
Statistics 2	- The overall teaching quality is engaging. The lecturer had put significant effort into providing support to students, such as promptly answering questions on the discussion board with detailed responses. - The weekly summaries of course content provided at the second part of the course are very useful for students to consolidate their understanding of the material. - The tutorials, coursework, and exam are manageable, as the lecturer has offered sufficient guidance and support. This includes creating weekly homework evaluations that highlight common weaknesses and provide overall feedback to help students improve.	- Students generally believe the course content in Weeks 1 to 3 is quite easy, as there is significant overlap with the material covered in Year 1. - Some students reported difficulties with studying the topics related to Bayesian Statistics, as these were taught in Week 11, leaving them with less than two weeks to study the material, despite it accounting for around 25% of their exam performance.	- Extra voluntary exercises for Bayesian Statistics should be provided. - The lecturer should also spend some time encouraging students to explore the non-examinable supplementary materials provided in the lectures, as they are quite interesting and could definitely benefit students in their future studies.
Algorithms and Machine Learning	- Most students agreed that the lecturer delivered the content well during lectures, but the overall teaching quality was hindered due to the lack of supportive measures. - There were insufficient resources available for students to revise. In particular, the computer labs were too focused on applied problem sheets that excluded Machine Learning (ML) topics and instead covered numerical methods. - According to the post-exam survey, most students were dissatisfied with the exam arrangements for this course. - The lecturer failed to respond to the Final Survey on the Blue Systems platform.	- The course content is imbalanced, as it tends to focus more on "Algorithms" rather than "Machine Learning". - While the material in Chapters 1, 2, and 5 is straightforward, there is a significant jump in difficulty in Chapter 3. The lecturer spent disproportionate time on some relatively less familiar concepts, such as Monte Carlo methods and PCA, reducing the time available for other important topics in the later stages of the course. - Chapters 6 and 7 are fundamental to Machine Learning, but they were taught over a very short period. These final two weeks accounted for 40% of the final exam, leaving students with insufficient time to revise and consolidate their learning.	- Since the course content for Ch. 6-7 is quite challenging, these topics should be taught earlier in the course, while Graph-related topics could be covered later. - More supplementary exercises related to the mathematical concepts in ML are necessary - In the future, if a new Year 3 elective on advanced algorithms in ML is introduced, it is recommended that this course refocus on databases and algorithms with basic ML knowledge, allowing students to build a solid foundation before advancing to more complex topics.

Programming and Data Analysis for Scientists	- The format of the workshops remains similar to last year: participants are expected to self-study the materials, which are mixed among students with varying levels of experience. - Students were unable to provide feedback through the Mid-Unit Survey on the Blue Systems platform.	- The course content after Week 6, particularly the introduction to C++, heavily overlaps with the Year 1 Algorithms and Programming course content. - The contextual background for computational practice requires knowledge of physics, making it challenging for students without a strong physics background to complete the tasks	As suggested in the previous report submitted to the Faculty, we recommend that the School develop a new Python-based data analysis course specifically designed for Data Science students. This would address the aforementioned issues and provide a more relevant and accessible course for students in the long term.

3. Concerns about the Using Feedbacks to Improve Learning

As the School of Mathematics is interested in exploring how students use feedback to improve their learning, here are some of our initial ideas on the key factors that shape effective feedback:

- Since most of the courses in the School of Mathematics focus on hardcore knowledge and structured assessments that involve non-open-ended questions, students primarily use feedback to verify **whether their answers are correct, check the completeness of their solutions (especially for proofs), and identify ways to improve their answers**.

- It should be noted that students are more eager to engage with feedback when they identify **both strengths and mistakes** in formative assessments. Understanding common errors is crucial for preventing these mistakes from recurring in future assessments, while recognising strengths helps remind students to retain these positive elements in subsequent work. Therefore, it would be ideal if lecturers could provide detailed marking, such as directly highlighting the lines that lead to errors, rather than giving brief, generic descriptions of the homework. This approach would better demonstrate ways for students to improve their work.

- One example of good feedback practices can be seen in how regular coursework is marked in Statistics 2:
    a. Most individual formative and summative coursework is marked line by line.
    b. After each weekly formative coursework, a generic homework feedback report is provided, which highlights common student strength and weaknesses.
    c. For each summative coursework, there is overall feedback, including comments on all questions and a mark distribution summary.

- We understand that not all courses may have the manpower to provide such detailed feedback or conduct overall reports. **However, if a course can at least highlight both students' strengths and weaknesses with quoting evidences from students' work**, it should be considered good feedback practice.