Computational Biology & Systems Biology 3
IBMS9009

Zhejiang University – University of Edinburgh Institute

Course Handbook
2022-2023

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DISCLAIMER

The contents of this Handbook apply to the session year stipulated. The Institute may make changes to the course for future sessions.

Every effort has been made to ensure that the information contained in this document is correct at the time of going to press. However, it will not form part of any contract between the Institute and a student and must be read in conjunction with the Terms and Conditions as set out in the International Campus Detailed Regulations, the ZJE Institute Supplementary Regulations and the ZJE Institute Taught Assessment Regulations. The contents of this handbook apply to the session year stipulated. The Institute may make changes to the course for future sessions.

If you require this document or any of the ZJE online resources mentioned in this document in an alternative format please contact the ZJE Administration Office [zjeteaching@intl.zju.edu.cn, 87572810]

COMPUTATIONAL BIOLOGY AND SYSTEMS BIOLOGY 3

Contents

1. GENERAL INFORMATION

1.1 Overview of Course

Computational biology and systems biology are important areas of bioinformatics. These approaches study biological systems with a focus on their mechanisms and on emergent properties arising from mechanistic interactions. This course introduces various types of computational models widely used in biomedical sciences: probabilistic and deterministic, top down and bottom up, from molecular to systems to population levels. Students will learn the ideas behind those modelling techniques, gain familiarity with commonly used modelling software and apply their skills to answer questions from biochemistry, molecular biology, neuroscience, pharmacology, and epidemiology. The course will also cover standards for model building and sharing, as well as model databases and repositories.

1.2 Course Learning Outcomes

After taking this course, students will be able to:

1. Describe the key principles of computational modelling in life sciences.
2. Develop and implement appropriate models for specific biological systems and be aware of their capabilities and limitations.
3. Adhere to common standards of model description, sharing and storage in databases.

1.3 Course Handbook

This Course Handbook gives you contact information and contains an outline of the course structure and content, formative and summative assessments. More details can be found on the CBSB3 Blackboard Learn page. General information about your courses, programme, studying and academic life at the ZJE Institute can be found in the Programme Guide.

1.4 Feedback

Giving, receiving, understanding and acting on feedback is critical in developing your knowledge and skills. The aim of feedback is to give you an indication of how your work compares to the desired standard. Most commonly, this is indicated by a mark, but written or verbal feedback, specific to you as a learner and the specific piece of work, will also be given.

In this course, we aim to make our feedback useful, timely, consistent and concrete – we will describe what you did well and what you need to improve to achieve a better outcome. For each

piece of formally assessed work you will receive your mark and feedback within 15 working days of submission.

Certain components of the course (the ICAs, for example) will be followed by very clear instances of academic feedback. But remember that feedback is not limited to this. In CBSB3 there will be many types of formal and informal feedback, and feedback can come from your classmates too. An important skill is to recognise *when* you are being given feedback. **Throughout the course, think about and use all the feedback you are given to improve your work!**

1.5 Formative Assessment

In addition to assessments that contribute to your final mark (summative assessments), the course features formative assessment in form of a mid-term exam. The formative assessment does not contribute to your final mark.

Formative assessment provides ongoing feedback that you can use to improve your learning and better prepare for the final exam, which will have a similar structure and style. It helps instructors improve the teaching by identifying concepts that are difficult to understand, skills that are difficult to acquire, and other issues.

1.6 Student Support

If you encounter any difficulties with, or a have questions about, a specific aspect of the course, in the first instance you should discuss this with the member of staff responsible for delivering that material. You can find their name on the detailed schedule on the CBSB3 Blackboard Learn page. The Course Administrator can provide you with their contact details if required.

If you have questions or concerns about the course more generally, or a question about an assessment or feedback you have received, please contact the Course Administrator or the Course Organiser – their contact details are in this Handbook.

You can also talk to your Academic Advisor about any issues you experience. Please see the Programme Handbook for more information on expectations about the Academic Advisor-Advisee relationship.

Further information and sources of support can be found in section 9 of this Handbook.

1.7 Special Circumstances

Special Circumstances are defined as events that are beyond the control of the student and which have the potential to adversely impact on academic performance. The ZJE Special Circumstances Policy provides a mechanism for students to notify the ZJE Institute about any special circumstances affecting their performance during the academic year, for the ZJE Institute to assess the impact of any special circumstances and take action accordingly.

Full information on the ZJE Special Circumstances Policy and procedures can be found in the Programme Handbook.

If you are experiencing any circumstances that are having a negative effect on your work or your engagement with the course, we strongly encourage you to contact your Academic Advisor as soon as possible.

1.8. Changes to teaching and learning approaches in 2022-23

Until the end of 2019, all your teachers were on campus and all classes took place face-to-face. However, since early 2020, because of the Covid-19 pandemic, many of your teachers have been unable to travel to China from overseas or been unable to travel easily between provinces in China. It is very important that these travel restrictions are respected. The safety of our students and staff is a priority, and these restrictions help us to keep all members of the ZJE community safe.

For 2022-23, we have changed the way we deliver teaching and learning activities at the Institute. This new way of teaching is called 'hybrid teaching'. This change is **temporary** and will return to fully face-to-face teaching as soon as we can.

Hybrid teaching involves a combination of face-to-face teaching and online teaching. Some of your teachers will be on-campus, and others will be off-campus. Details are given below. This means that your off-campus teachers will interact with you online either **synchronously** or **asynchronously** (i.e. using recordings posted on Learn and Discussion Board there). For sessions delivered online there will be discussion boards, which course organisers and instructors will attend regularly, and live tutorial Q&A sessions to help everyone communicate.

Lectures by off-campus teachers will still take place in specific rooms at the timetabled time, where the recordings will be played and discussion may take place among the students. Some workshops will take place at least partly synchronously and for those workshops on-campus students should come to the workshop room. You will be provided details of these classes and their location.

Your teachers have thought very carefully about how to deliver teaching online, but we want your feedback during the semester on how these approaches work and how we can make them better. You can contact the course organiser, your academic advisor or your student representatives with your feedback. The new student representatives for 2022-23 will be selected early in the semester and you will be informed of who they are after selection has taken place.

2. COURSE COMMUNICATION

2.1 Course Team

Course Organiser	Gedi Luksys (GL)	gedi.luksys@ed.ac.uk
Academic staff	Hugo Samano (HS)	samano@intl.zju.edu.cn
	Rob Young (RY)	robert.young@ed.ac.uk
	Fangwei Shao (FS)	fangweishao@intl.zju.edu.cn
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	Yong Wang (YW)	yongwang_isb@zju.edu.cn
	Pavel Loskot (PL)	pavelloskot@intl.zju.edu.cn
	Zhaoyuan Fang (ZF)	zhaoyuanfang@intl.zju.edu.cn
Course Administrators	Yanhui (Cheryl) Chen (YC)	yanhuichen@intl.zju.edu.cn
	Qimei (Beth) Zhu (QZ)	qimeizhu@intl.zju.edu.cn

2.2 Blackboard Learn

The course is supported by Blackboard Learn, a virtual learning environment. Course materials and extra resources are provided there. You will submit some summative assessments via Blackboard Learn. **Please make sure that you regularly check the Blackboard Learn course website.** This is the definitive source of information, course materials and changes to the timetable or assessments. You can access Blackboard Learn here: https://c.zju.edu.cn/

2.3 Student-Staff Liaison Committee

The academic staff welcome your views on how the course can be improved and, when appropriate, we will act on your suggestions. To ensure that the views of all students are represented, you will elect Student Representatives ("Student Reps") soon after the start of the course. Throughout the course, please raise issues with your Student Reps who will pass these to the Course Organisers.

An online student feedback survey will take place at the end of Semester. You can give your anonymous opinions on the course content, level of difficulty, level of interest, suggestions how to improve the course, and any other comments (positive and negative).

Student Reps and selected academic staff make up the Student-Staff Liaison Committee. This committee will meet formally towards the end of Semester to discuss the feedback surveys and other issues raised by staff and students.

You may also discuss course issues at any time by contacting the Course Organisers or the Course Administrator.

2.4 External Examiner

David Halliday the External Examiner for this course. You should **not** make direct contact with the External Examiner. Contact the Course Organisers if you have questions on assessments.

3. COURSE STRUCTURE

Teaching sessions are interactive and student-centred wherever possible. These sessions are your opportunity to consolidate and expand your knowledge and understanding of course material, **take advantage of these opportunities!**

This course is integrated. **You are expected to attend every teaching session.** If you are unable to attend, you should email the Course Administrator or the Course Organiser giving a reason for your absence.

Lectures will cover essential material on a variety of computational & systems biology topics and fundamental modelling techniques. Workshops will consolidate knowledge learnt in the lecture of that day and will have one or several of the following formats: tutorial (e.g. paper discussion), problem sets (e.g. solving modelling problems conceptually or mathematically) and practicals (e.g. trying out a package, testing models or writing some code yourself). Although programming will occasionally be needed, particularly in the miniproject, this is not the main focus of the course and there is no standard programming language. Unless specified otherwise, you are welcome to use any of the languages you learned. Instructors will use the one (usually among the ones you learned, unless that's impossible due to external constraints) that is the most convenient for them.

3.1 Timetables

You can find timetable information at PeopleSoft.

If there are any changes to your timetable (for example, a change of venue) you will be emailed information about the change, and a notice about the change will be posted on Learn, so please check Learn announcements regularly.

3.2 Lectures

Lectures are from 9:00 to 9:50 (unless indicated otherwise) every day on weeks 1-4, except on days when miniprojects are presented and the days of hackathon. Copies of the lecture slides/recordings where relevant will be given on Blackboard Learn at least 24 hours before the lecture. Supporting materials (such as links and videos) will sometimes be posted on Blackboard as well, before the lecture. For lectures delivered online, there will be a discussion forum where you could ask questions about each lecture.

3.3 Workshops

Workshops will take place on 15:00 to 16:50 (unless indicated otherwise) on all days that lectures are given (except for 13:00 to 14:50 on Mondays for those of you who have PE from 15:00). They will contain a variety of different sessions:

- Discussion of papers or general questions related to Computational & Systems Biology

- Problem sets related to lecture on the same day

- Computer-based practicals, where you will practice different models and modelling environments or test some algorithms related to them.

You need bring your laptop to all computer-based practicals, and to other sessions only if that is indicated.

Any workshop materials that you will need to read and prepare before the workshop will be provided before the corresponding lecture and you will be expected to work on them between the lecture and the workshop.

Workshops will be given in one of the following formats, which will be specified for each workshop.

- Online using the discussion board, in which case any relevant materials and discussion threads will be posted before the lecture and you will normally be expected to respond by the end of workshop time. **In this case you don't need to go the classroom.**
- In person (and via live link to any off-campus students), where an off-campus instructor will be available for all or part of the workshop time. **In this case on-campus students are expected to go to the classroom.**
- In person (and via live link to off-campus students) with an on-campus instructor, in which case **on-campus students are also expected to go to the classroom**.

3.4 Audio Recordings

All lectures taught by staff currently not on ZJU International Campus will be recorded. Other lectures will be given in person and recorded in class for off-campus students.

3.5 Miniproject introduction and hackathon

On March 1 a supervisor of each project (or another member of the teaching team, if the supervisor can't make it) will introduce the project and you will be encouraged to ask questions about anything related to the project. In case of self-proposed projects, the proposer and/or their supervisor will be encouraged to present the project to others. Detailed schedule as well as preliminary list of miniprojects will be announced shortly before that. Then, you will have to **submit your miniproject preferences** by **March 6**. Miniproject-student matching will be done by **March 8**. March 9 and 10 will contain hackathon that will involve getting familiar with the mini-projects as well as techniques and packages necessary for their completion (if they had not already been discussed in lectures/earlier workshops). Again, supervisors will be available to guide you as much as possible and more details/schedule will be provided beforehand.

3.6 Course Timetable

Below you can find a tentative plan of topics and teaching staff for each session. Any changes will be announced on Blackboard Learn and updated here.

The formative mid-term will take place in mid-March shortly after the hackathon (date TBD)

You will have your miniproject assigned by March 8.

On weeks 6-7 there will be the first meeting regarding the planning of the miniproject with your supervisor.

You will then need to submit your miniproject proposal by **Friday, April 7, 12:00** noon.

On weeks 10-11 there will be the second meeting regarding the progress of the miniproject with your supervisor.

There will be several Q&A sessions in March, April and/or May that will be announced later.

You will need to submit the final miniproject report by **Friday, May 19, 12:00** noon.

Week 1	**Modelling fundamentals, dynamical systems**	**Staff**
Mon, Feb 13	Introduction to computational modelling in life sciences	GL
Tue, Feb 14	Model types and structures	GL
Wed, Feb 15	Model simulation and evaluation	GL

Thu, Feb 16	Dynamical systems and their analysis	GL
Fri, Feb 17	Modelling neurons and synaptic plasticity	GL
Week 2	**Modelling molecules and populations, parameter estimation**	**Staff**
Mon, Feb 20	Introduction to protein structure & interaction modelling	HS
Tue, Feb 21	Protein modelling and molecular dynamics	HS
Wed, Feb 22	Modelling neural circuits and systems	GL
Thu, Feb 23	Model parameter estimation and evaluation	GL
Fri, Feb 24	Modelling spread of infectious diseases	GL
Week 3	**Miscellaneous modelling and methods topics 1**	**Staff**
Mon, Feb 27	Population models, cellular automata	GL
Tue, Feb 28	Modelling cancer, probabilistic approaches	GL
Wed, Mar 1	*Neuronal modelling – make up workshop 5b online (no lecture)* *15-17: Introduction to GL miniprojects (A426)*	GL
Thu, Mar 2	9-10 (A401), 15-17 (A426): Signalling systems, multi-state models *10-12: Introduction to HS miniprojects (A401)*	HS
Fri, Mar 3	9-10 (A401), 15-17 (A426): Synthetic biology *10-12: Introduction to PL miniprojects (A426)* *13-15: Introduction to YW miniprojects (A426)*	TC
Week 4	**Miscellaneous modelling and methods topics 2, hackathon**	**Staff**
Mon, Mar 6	Model descriptions and languages	ZF
Tue, Mar 7	Model sharing standards and databases	RY
Wed, Mar 8	Biochemical reaction modelling, ODEs (lecture at 10-11 in B406)	FS
Thu, Mar 9	Biochemical reaction modelling workshop at 13-15 in A426 Hackathon day 1: Hugo 9-12, Gedi 15-17	all
Fri, Mar 10	Hackathon day 2: Yong 9-12, Pavel 13-16, Gedi 16-17	all

Sessions marked in blue will be delivered in person.

For other sessions, lectures will be pre-recorded and workshops will take place online either synchronously (in which case you should come to the room / online for off-campus students) or asynchronously (in which case you should discuss on Discussion Board). Information regarding the type of workshop will be provided at least 24h before the beginning of that workshop.

4. TEXTBOOKS

In addition to attending and engaging in teaching sessions, you should read independently. Academic staff will often include specific recommended reading in their teaching sessions, but the books listed below are recommended for this course.

Voit (2017), "A First Course in Systems Biology", 2nd edition, Garland Science

Dokholyan (2012), "Computational Modeling of Biological Systems: From Molecules to Pathways", Springer

Schwartz (2008), “Biological Modeling and Simulation: A Survey of Practical Models, Algorithms, and Numerical Methods”, 1st edition, MIT Press

Trappenberg (2010), “Fundamentals of Computational Neuroscience”, 2nd edition, Oxford University Press

5. ASSESSMENT AND EXAMINATION INFORMATION

This course is assessed by degree examination and by in-course assessment (ICA).

The degree examination component contributes 50% to your final course mark and the ICA component contributes 50% to your final course mark.

Only a pass mark for the whole course (**not** for different components) is required for passing.

5.1 In-Course Assessment

The ICA will consist of an individual miniproject, which will be first presented in detail during the introduction, although preliminary topics will be available earlier. It’s also possible to propose your own topic, so long as it is related to the course, you are familiar with the relevant techniques, its scope is appropriate, and you can find a staff member willing to supervise it.

Possible projects include, but are not limited to:

- Choosing a well-defined biomedical question and building a computational model of it.
- Characterising an existing computational model with respect to robustness, sensitivity, or behaviour in a novel biological scenario.
- Re-implementing a published model in another modelling software, so that it aligns with modelling standards.
- Curating a published model for inclusion in repositories such as BioModels database.
- Writing a converter from one model description language to another, creating new avenues for model sharing and exchange.

For this ICA you will need to produce two reports:

1. A proposal that details what you plan to do, including a brief background, aims/hypotheses, description of methods, plan and feasibility assessment (10% of your total mark).

2. The final report that includes a full literature review, methods, results and their discussion (40% of your total mark).

Further details are given in Section 6 and will also be provided later.

5.2 Degree Examinations

The exam will consist of short-answer questions (SAQs) of various formats (e.g. theoretical questions, solving mathematical problems, evaluating what a particular algorithm or model does, describing how a particular result can be achieved) and is worth 50% of your final mark. The exam will take place at the end of the course. You will have a chance to practice answering SAQs in workshops and in the formative mid-term. You will receive feedback (including a mark) to your mid-term and final answers.

Both exams will test your **understanding** of modelling principles and models discussed in class and will be open book. The open book format does not imply that you can study the relevant questions during the exam or copy answers from the slides! The questions often require good understanding, integration and application of knowledge for which regular attendance of lectures and workshops as well as preparation are essential. You will not be asked to write code but may need to answer questions related to the provided code (or pseudocode).

Please note that exam questions will only test the material discussed in class (lectures and workshops); so, although you're welcome to use the textbooks if they facilitate your understanding, no material in textbooks will be examined unless it was discussed in class. It's also possible that some of the exam questions may not be covered in the textbooks.

Feedback to the formative mid-term (mark and comments for each answer) will be discussed in the mid-term review and Q&A session, where you will have a chance to ask questions about the midterm, the final, and generally about the course.

5.3 Resit Information: Failure to meet the pass criteria.

Under University of Edinburgh regulations, resits are not permitted in Year 3. Further guidance on progression from Year 3 to Year 4 is available in the Programme Handbook. If you fail to meet the pass criteria for the course, you must discuss your options with your Academic Advisor.

5.4 Common Marking Scheme

Assessment will be graded according to the ZJE Common Marking Scheme. This is given in the Programme Handbook. Detailed written guidance and the marking criteria for each ICA will be

posted in advance on Blackboard Learn. For guidance on the marking scheme, see the Programme Handbook. You will receive written feedback and a **provisional** mark for each of your ICAs by the dates indicated above and below. Your final mark for the course will be made available after the Board of Examiners has ratified all examination and ICA marks. The Board of Examiners meeting takes place soon after the end of Semester 2.

6. IN-COURSE ASSESSMENTS (ICAs)

6.1 Miniproject proposal

You will receive an individual mark for this assessment that is worth 10% of your final mark based on the proposal of your miniproject. The proposal should contain the following elements: background & motivation, specific aims and/or hypotheses, a brief summary of methods, work plan and feasibility assessment. It should have **no more than 1000 words (including references and figure/table legends if any – please include word count in your submission)** and should not include any presentation of data or analyses you may have already performed.

Background & motivation (20% of the mark). In this part you should *briefly* discuss literature and prior work relevant for the project as well as why the questions you try to address in your miniproject are interesting and important for computational & systems biology.

Aims/hypotheses (20% of the mark). In this part you should discuss specific aims that your miniproject intends to accomplish and any hypotheses you may have following up from literature review. From this section it should be clear what exactly you plan to do. For example, if you work on a model, explain what your model does and what aspects of it you will focus on (e.g. design, simulation, testing, parameter estimation). If you work on a toolbox or a platform, explain what it does and which aspects you aim to improve and/or which problem you may solve using it.

Summary of methods (20% of the mark). In this part you should *briefly* present techniques you plan to employ in the miniproject. If in background & motivation you discuss *which* questions are important and *why*, here you discuss *how* they can be addressed from the computational standpoint, e.g. how a model can be simulated, how it can be compared or fit to data, how a toolbox can be evaluated. Do not expand on technical details such as which programming environments, libraries and packages you use and how, although you can mention them briefly.

Work plan & feasibility assessment (20% of the mark). In this part you should present a tentative plan for your work, like what you plan to do at first, what after, and what last (should not be more detailed than on weekly basis), is there a logic for that particular order and what are potential challenges and fallback options, if some things don't go as intended.

You will not be required to follow your proposal plan when later carrying out your work, especially if a good reason becomes apparent to try a different approach. However, it's important to have a realistic and reasonably detailed plan to ensure smooth progress in the miniproject.

The final 20% of the mark will be given for style and clarity. Your report should be clear, well organised and neat, not exceed the word limit or give a significantly inaccurate word count (or no count at all). English mistakes will only be penalised if they are excessive or make it difficult to understand what you meant. All references should follow the same style (which style is up to you). Figures and tables (if any) should be presented with legends, axis labels and clearly readable fonts in the sequence they are presented in text and ideally placed within the text (not at the end).

The deadline for the miniproject proposal is Friday, 7 April 2023 noon (12:00). You will submit your miniproject report on Blackboard Learn. Electronic submission gives you greater flexibility on when you submit your work and accurately tracks your submissions.

6.2 Miniproject final report

You will receive an individual mark for this assessment that is worth 40% of your final mark. Even if your miniproject involves working in a group with another student to address its different aspects, you will be expected to perform your part of the project by yourself and write up the report based on your own work (with others' work only mentioned if it is needed to help understanding for your part). It is normal for a substantial part of the project to be based on joint work, but **it's important that you specify which parts were done together and which separately and acknowledge everyone's contributions** (including any other lab members not working on miniprojects, if relevant, and any prior work, including that of yourself). It should be clear what exactly you did by yourself during the course of the miniproject and what others did.

The purpose of miniproject is to be able to perform rigorous research in computational & systems biology and document your research process, findings and their interpretations, in style of a short paper. It should include an abstract, a brief introduction to the topic that includes a review of relevant literature, defining questions addressed in the report and motivation behind them (why they are interesting; how they can advance our understanding), specifying hypotheses and/or scope of the study, describing methods and results of the study, their discussion and critical evaluation (how they relate to hypotheses and relevant literature; if there is a mismatch, what could be possible reasons), and finally, proposals for further experiments/analyses or how to modify the existing ones.

Although there are no explicit word or page limits, the recommended length of your report is 1800-2000 words including figure and table legends. Some reports may contain more figures/tables, in which case they should contain less text, and vice versa. **We expect you to present the materials that you feel are relevant concisely**. If your report is substantially longer than this due to excessive verbosity or inadequate selection of materials (e.g. presenting lots of vaguely relevant details that

don’t provide much insight or are not discussed), this will substantially decrease your mark. Codes and any non-essential results should be submitted in the appendix. The markers won’t be obliged to read them but may do so if they have any questions. Please provide the word count (not including appendices/codes).

The deadline for the miniproject report is Friday, 19 May 2023 noon (12:00). You will submit your miniproject report on Blackboard Learn. Electronic submission gives you greater flexibility on when you submit your work and accurately tracks your submissions.

All submissions will be marked by your supervisor and another marker. Moderation will be performed in case of substantial discrepancies between marks and/or feedbacks.

It is okay to reuse some of the materials (like literature sources, research questions/hypotheses, methods) from your proposal, but you should describe them anew and in a more detailed way – **copy-pasting any text directly from the proposal is not allowed and would constitute self-plagiarism**. Evidence of ability to address flaws from your miniproject proposal (as described in our feedback) where relevant in the final report is a big plus.

Here are marking criteria for the miniproject report:

- Background, motivation and aims (20% of the mark). In this part you should discuss literature and prior work relevant for the project as well as why the questions you try to address in your miniproject are interesting and important for computational & systems biology. Then discuss specific aims that your miniproject intends to accomplish and any hypotheses you may have following up from literature review. From this section it should be clear what exactly you planned to do. For example, if you work on a model, explain which aspects of it you will focus on (e.g. design, simulation, testing, parameter estimation). If you work on a toolbox or a platform, explain which aspects you aim to improve and/or which problem you may solve using it. **These aims need not be the same as what you specified in the proposal, but rather related to what you actually did in the miniproject**.
- Materials and methods (20% of the mark). In this part you should present techniques you employed in the miniproject. If in background & motivation you discuss *which* questions are important and *why*, here you discuss *how* they can be addressed from the computational standpoint, e.g. description of your model/toolbox, how a model can be simulated, how it can be compared or fit to data, how a toolbox can be evaluated. Based on information in the methods it should be possible to reproduce what you did. If you use any standard approaches that are published and/or which you learned in the past workshops, you don’t need to describe them in detail – only refer to relevant publications and/or workshop materials (including in other courses, not only CBSB3). You don’t need to describe detailed methods for the parts you did not focus on (but other students did).
- Results (20% of the mark). In this part you should present your findings based on what you described in methods in a clear and complete way. Use the relevant statistics where appropriate. Include figures or tables where you feel they are useful and informative. You

can provide some brief interpretations to make the overall logic of your results clear but leave extended interpretations for the discussion. Your results should be sound and correct, indicate good understanding of the topic and evidence of significant individual contributions, even if parts of your work are based on previous research and/or contributions by other people (which should be properly acknowledged). Your results should include some substantial new findings that address your research question (i.e. not only what was known before). Importantly, **there is no expectation of positive findings** – such as statistically significant differences, good fits of your model with data, etc.

- Discussion and critical evaluation (20% of the mark). Here you should present the extended interpretations of your findings with fair and critical assessment of what worked well, what did not and why. You should also discuss what could be done to achieve a better outcome and more generally the relevant future steps for your research project, integrating your findings with literature. We expect evidence of critical thinking and good evaluation of your results, whether positive or not. In case of negative findings, problems with your model, toolboxes, etc. we expect some discussion why you think it happened and what you would have done differently in retrospect. Please make sure that your results and discussion are related to the aims/hypotheses and methods that you stated in the above sections.
- The final 20% of the mark will be given for organisation, style and clarity. Your report should be clear, well organised and neat, not exceed 2000 words or give a significantly inaccurate word count (or no count at all). English mistakes will only be penalised if they are excessive or make it difficult to understand what you meant. All references should follow the same style (which style is up to you). Figures and tables should be presented with legends, axis labels and clearly readable fonts in the sequence they are presented in text and ideally placed within the text (not at the end). Ability to select informative figures/tables will be important for this part of the mark. Proper acknowledgments should be included.

It is okay to merge methods and results if you feel it is helpful for readability, especially if your work consists of several rather different parts, e.g. first presenting some methods/model descriptions and then results for them, then more methods/model descriptions and more results.

If you have problems submitting using Blackboard Learn, please contact the Course Administrator as soon as possible. **It is your responsibility to ensure that you have successfully submitted your assignment to Learn before the deadline**. Information on extensions and penalties for late submission can be found below.

6.3 Penalties and Extension Requests

If your proposal/report was submitted after the deadline, it will be recorded as late and a penalty will be deducted from the mark unless there has been an approved extension to the deadline. The penalty will be a reduction of your mark by 5% of the maximal mark per calendar day (e.g. if submission exceeded the deadline by 24 hours and 3 minutes, which are more than one full day,

your mark will be reduced by 10%). The penalty will increase incrementally by 5% of the maximum mark each day for up to seven calendar days, after which a mark of zero will be given. The original unreduced mark will be recorded, and the student informed of it. After the Board of Examiners meeting, penalties will be applied, and the final ratified mark recorded on the student record system.

If you are unable to submit your ICA by the deadline because of circumstances beyond your control, you can submit a request for an extension of up to seven days (including weekends). The request must be made using the ZJE Extension Request Form **before the submission deadline**.

If you submit the practical report over seven days after the assessment deadline, the work will be marked but no mark released to the student and no feedback will be given to the student. You must consult with your Academic Advisor in these circumstances on the appropriateness of submitting Special Circumstances documentation. Please also see section 1.7 above, and the Programme Handbook. The Board of Examiners will make a decision on whether to ratify this mark in light of any instruction from the Special Circumstances Committee.

6.4 Using references

Your reports will build on the work of other researchers and teachers. You acknowledge this by using references. You must use references to give credit to the original worker when you write about ideas, concepts or data that are not your own. Referencing lets your reader distinguish *your* ideas from *other people's* ideas, and lets your reader follow up on ideas that interest them by directing them to the original author. Failing to use appropriate referencing is a form of plagiarism.

A correctly and consistently formatted reference list must appear at the end of your reports where you have referenced other people's work.

You may wish to use references from non-English language sources. If you do cite references in languages other than English, your markers need to be able to review their content. Therefore, if you reference a non-English language source, a full English translation must be supplied as an appendix to your ICA.

If you worked together with your fellow students, it is absolutely essential to acknowledge them in your report, specifying their contributions. If they don't wish to be acknowledged, you should still specify in which parts/aspects of your work you received help from others.

6.5 Plagiarism and Academic Misconduct

Electronic submission also allows us to automatically check your work for plagiarism. When you submit work electronically to Learn, you will be asked to confirm that you have read and agreed to

an ‘Own Work Declaration’. Please read this carefully, and make sure that you have met all of the requirements listed on the declaration.

Although collaboration among students is allowed in your miniproject work, **you must write both reports entirely by yourself. It is strictly forbidden to ask your fellow students to share their reports (including figures and tables) and use such reports as a basis of your report (even if with changing language/rephrasing). It is also strictly forbidden to use AI generated text or other materials in any of your written works.**

Full information on avoiding plagiarism, and penalties for academic misconduct, can be found in the Programme Handbook.

7. Attendance

There are numerous benefits of attending classes. For example, in-class activities often enhance your critical thinking skills, and face-to-face discussion with your teacher can help clarify your understanding of difficult concepts. Furthermore, classes have a social aspect – you build relationships with your classmates and your teachers. As such, it is important that you attend all your classes.

Failure to attend classes regularly has serious consequences. Attendance will be checked randomly in any of the sessions (lectures, tutorials, workshops). It is your responsibility to register your attendance when necessary. **It is not allowed for someone else to sign your name, if you are not present.** With poor attendance you risk failing the course and failing to complete the programme.

In addition to teaching sessions, you must be available for assessments, examination and meeting Academic Advisors face-to-face or electronically. If you are unable to attend any class or assessment, you shall ask for leave in advance (you may apply retrospectively for leave in cases of emergency).

8. DIGNITY AND RESPECT

Zhejiang University and the University of Edinburgh have strong and long-standing commitments to equality, diversity and inclusion, and to promoting a positive culture which celebrates difference, challenges prejudice and ensures fairness. ZJE’s staff and students are its greatest assets and all members of the ZJE community should expect to be able to excel, and be respected and valued.

Integrity, collegiality and inclusivity are central to our values. In accordance with these values, ZJE is committed to providing an environment in which all members of our community treat each other with dignity and respect, and where bullying, harassment and discrimination are unacceptable.

The ZJE Dignity and Respect Policy sets out the expectations placed on all members of ZJE, including students. The policy can be found here: http://zje.intl.zju.edu.cn/en/student-account/institute-regulations

9. FURTHER INFORMATION AND SUPPORT

The following information can be found in the Programme Handbook or on the ZJE Institute or International Campus website, as follows:

Late submission of work	Programme Handbook
Academic appeals	Programme Handbook
Academic Misconduct	Programme Handbook
Plagiarism	Programme Handbook
Special Circumstances	Programme Handbook
Residential College	http://residential.intl.zju.edu.cn/en
Study Support	http://residential.intl.zju.edu.cn/en/content/academic-life
My ZJU	http://www.intl.zju.edu.cn/en/custom_user/login?destination=myzju
Information Technology Services	http://its.intl.zju.edu.cn/en
Library	http://lib.intl.zju.edu.cn/
Sport and exercise	http://coc.intl.zju.edu.cn/en
Health services	http://coc.intl.zju.edu.cn/en

9.1 Opportunities to give feedback on your course

General

You can give feedback directly to the course organiser (CO) at any time, ideally by email. If you do not wish to communicate with CO directly, you can speak to one of your Student Representatives (Student Reps) for your programme who will pass on the feedback to the CO. These Reps will be selected and their names announced in the first three weeks of semester 1. We will specifically ask the Student Reps for feedback on hybrid teaching approaches early in semester 1. We particularly welcome your opinions on these teaching approaches.

Student-Staff Liaison Committee

Student Reps and selected academic staff make up the Student-Staff Liaison Committee (SSLC). This committee meets formally twice each year towards the end of Semester 1 and Semester 2 to discuss issues raised by staff and students. This is an opportunity to give feedback on the whole programme not just on individual courses. Your Reps will actively seek feedback from you shortly before this meeting.

Course Enhancement Questionnaires

Near to the end of the course you will be invited to complete a formal and detailed online survey. Please take time to complete this survey. It is the most important source of student feedback, and it allows us to improve the experience for students in future years. It also feeds in to the Quality Assurance and Enhancement processes.

https://www.ed.ac.uk/biomedical-sciences/bmto/wellbeing-support/feedback/how-student-feedback-works