**University of Stirling BIOU9PC lab practical rubric**

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| **Criteria** | **Fail (0-39%)** | | **3rd class (40-49%)** | **Lower 2nd (50-59%)** | **Upper second (60-69%)** | **1st class (70-100%)** |
| **Introduction: (20%)** | | | | | | |
| *Explains what the study was trying to achieve and provides a wider context to the study* | The aim of the study is not addressed. How the study relates within the broader context of biology is not addressed. | | The aim of the study is addressed but not clear. The broader context is present but not clear. Important omissions/inaccuracies. | Provides some explanation of the aim of the study, and some basic broader context. Some omissions/inaccuracies. | Good explanation of what the aim of the study. The study is placed is an appropriate wider context. Contains only minor omissions or inaccuracies | Excellent explanation of the aim of the study. The study is placed in a clear wider context. No omissions/inaccuracies |
| **Hypotheses: (10%)** | | | | | | |
| *Hypotheses (or questions) are clearly stated, testable and consider plausible alternative explanations* | Hypotheses or questions are absent or too vague or confused not testable. | Hypotheses or questions are stated, but with unclear logical connections to the aims. The hypothesis may be compared with a “null” alternative which is usually just the absence of the expected result. | | Relevant and testable hypotheses are clearly stated, and connections to the project’s aims are reasonably well explained. | One or more relevant testable hypotheses are clearly stated and well-linked with project aims and knowledge gaps. Hypotheses address more than one major potential mechanism, explanation or factors for the topic. | A comprehensive suite of testable hypotheses are clearly stated which, when tested, will distinguish among multiple major factors or potential explanations for the phenomena at hand. |
| **Methods: (10%)** | | | | | | |
| *Experimental design is likely to produce salient and fruitful results, and clearly tests the hypotheses posed. Experimental design and analyses are replicable.* | Methods and approach are inappropriate or poorly explained or indecipherable. | Methods and approach are reasonably clear, appropriate and explained but not justified nor clearly relating to the project aims. Experiment or analyses insufficiently detailed to allow replication. | | Approach is clearly appropriate and explained but not justified nor clearly relating to the project aims. Methods and analytic approach sufficiently clear to understand study, but not to replicate it. | Approach is appropriate and clearly explained and justified. Methods and analytic approach sufficiently clear for a reasonable attempt at replication. | Approach is appropriate and clearly explained, and transparently promises to contribute to the specified knowledge gap. Experiment and analyses sufficiently clear or referenced to be replicated in their entirety. |
| **Results: Text (20%)** | | | | | | |
| *The key findings of the study are clearly highlighted in the text. There are citations to any Figures and Tables.* | The text is absent, inappropriate or indecipherable | There is some text but it is poorly written, confused but the reader is able to derive some meaning from it. | | The text summarizes the key findings of the study. It may contain minor deficiencies but does not substantially interfere with the reader’s understanding. | The text summarizes the results of the study to give the reader a clear sense of the key findings. Contains mistakes that do not interfere with the reader’s understanding and transmit clear meaning. | The text summarizes the results of the study in a manner that really effectively highlights the key findings. Contains mistakes that do not interfere with the reader’s understanding and transmit clear meaning. The text is elegantly written and constructed. |
| **Results: Data presentation (20%)** | | | | | | |
| *Data are summarized in a logical format. Table or graph types are appropriate. Data are properly labelled including units. Graph axes are appropriately labelled and scaled and captions are informative and complete.* | Labels or units are missing which prevent the reader from being able to derive any useful information from Tables or Figures. Presentation of data is in an inappropriate format or graph type. Captions absent, confusing or indecipherable. | Tables or figures contain some errors in or omissions of labels, scales, units etc., but the reader is able to derive some relevant meaning from each figure. Presentation is technically correct but inappropriate format prevents the reader from deriving meaning or using it. Captions are inadequate. | | Data are summarized to give the reader some sense of the dataset. Contains mistakes that do not substantially interfere with the reader’s understanding. Graph types or table formats are appropriate for data type. Includes captions that are at least somewhat useful. | Data are summarized to give the reader a good sense of the dataset. Contains mistakes that do not interfere with the reader’s understanding and transmit clear meaning. The reader can interpret the figures or tables without the reader referring to the text.  Graph types or table formats are  appropriate for data  type. | Contains no mistakes, and uses formats or graph type that effectively highlight relationships between the data points or other relevant aspects of the data, and improve the paper’s clarity. Figures or Tables may be elegant, novel, or otherwise allow unusual insight into data, and have informative, concise and complete captions. |
| **Discussion: (20%)** | | | | | | |
| *Conclusion is clearly and logically drawn from data provided. A logical chain of reasoning from hypothesis to data to conclusions is clearly and persuasively explained. Conflicting data, if present, are adequately addressed.* | Conclusions have little or no basis in data provided. Connections between hypotheses, data and conclusion are insufficient to allow reasonable evaluation of their merit. Conflicting data are not addressed. | Conclusions have some direct basis in the data, but contain important gaps or are overly broad.  Connections between hypothesis, data and conclusions are present but weak. Conflicting or missing data are poorly addressed. | | Conclusions have a direct basis in the data, but contain some gaps. Connections between hypothesis, data and conclusions are present but inconsistent. Does attempt to discuss any conflicting or missing data. | Conclusions are clearly and logically drawn with no gaps in logic.  A reasonable and clear chain of logic from hypothesis to data to conclusions is made.  Authors discuss or explain most obvious conflicting or missing data. | Conclusions entirely justified by data. Connections between hypothesis, data, and conclusions are comprehensive and persuasive. Conclusions address and explain conflicting data. Novel Synthesis of data/new insights. |