

## Rubric - Outcomes Assessment for LIFS UG Research Projects

**LIFS4970/4980 Biological Science Project Research I / Biological Science Project Research II**  
**LIFS 4971/4981 Biochemistry and Cell Biology Project Research I / Biochemistry and Cell Biology Project Research II**  
**LIFS 4973/4983 Biotechnology Project Research I / Biotechnology Project Research II**

A research project conducted under faculty supervision: design of experiments, analysis of data, and submission of a written report and poster presentation of research result

Estimated contact hour with supervisor: ~ 1 hour per week

### ***Intended Learning outcomes:***

Upon completion, students are able to:

- *Develop* acquisition and integration of knowledge in the chosen discipline.
- *Demonstrate* laboratory/practical skills through practical training and experimental designs.
- *Acquire* cognitive complexity through effective reasoning and creativity.
- *Achieve* personal development to be an academic through commitment, teamwork, time management and language proficiency.
- *Present effectively* both in oral and written language with rationale and logical organization.
- *Realize* the fundamental principles of academic integrity by following appropriate copyright and intelligent property issues related to scientific literature.

## Rubric for UG Research Projects

| Assessment Criteria   | Exemplary (4-5)   | Satisfactory (2-3)   | Unacceptable (1)  |
|---|---|--|---|
| <b>Knowledge (20%)</b><br>- Acquisition<br>- Integration  | <ul style="list-style-type: none"> <li>Demonstrated strong, broad knowledge not only in the chosen research area, but also in other areas of biological disciplines</li> </ul>            | <ul style="list-style-type: none"> <li>Demonstrated substantial knowledge in the chosen research area</li> </ul>   | <ul style="list-style-type: none"> <li>Demonstrated limited knowledge in the chosen research area</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Assimilated a wide range of knowledge into the chosen research area</li> </ul>   | <ul style="list-style-type: none"> <li>Incorporated subject-specific knowledge into the chosen research area</li> </ul>  | <ul style="list-style-type: none"> <li>Failed to correlate and integrate subject knowledge into the chosen research area</li> </ul>                                       |
| <b>Practical Skills (20%)</b><br>- Problem-Solving<br>- Technological Competence  | <ul style="list-style-type: none"> <li>Used appropriate and effective practical approaches to solve problems in the chosen research area</li> </ul>                                       | <ul style="list-style-type: none"> <li>Tried to use practical approaches to solve problems in the chosen research area, though part of them were inappropriate or unrealistic</li> </ul> | <ul style="list-style-type: none"> <li>Failed to solve problems in the chosen research area, and most of the approaches used were inappropriate or unrealistic</li> </ul> |
|   | <ul style="list-style-type: none"> <li>Demonstrated effective technological literacy and skills in the use of appropriate laboratory equipments</li> </ul>                                | <ul style="list-style-type: none"> <li>Demonstrated basic familiarity in the use of appropriate laboratory equipments</li> </ul>   | <ul style="list-style-type: none"> <li>Failed to use appropriate laboratory equipments and required close technical supervision</li> </ul>                                |
| <b>Cognitive Complexity (10%)</b><br>- Reasoning<br>- Creativity  | <ul style="list-style-type: none"> <li>Used appropriate information, personal experiences and observations to form decisions, opinions and perspectives</li> </ul>                        | <ul style="list-style-type: none"> <li>Defined abstract ideas with some discussion and interpretation of experimental data</li> </ul>  | <ul style="list-style-type: none"> <li>Failed to analyze and interpret data with either limited or no discussion, interpretation</li> </ul>                               |
|   | <ul style="list-style-type: none"> <li>Formulated new and effective approaches to solve problems</li> </ul>   | <ul style="list-style-type: none"> <li>Identified problems but offered alternative approaches occasionally</li> </ul>  | <ul style="list-style-type: none"> <li>Had no attempt to formulate new approaches or alternatives to solve problems</li> </ul>  |
| <b>Personal Development as an Academic (10%)</b><br>- Commitment<br>- Teamwork<br>- Time Management<br>- Language Proficiency<br>- Academic Integrity | <ul style="list-style-type: none"> <li>Demonstrated a strong commitment to this exercise, e.g. very frequent in submitting progress to the Supervisor</li> </ul>                          | <ul style="list-style-type: none"> <li>Accomplished the topic with some enthusiasm, e.g. less frequent in submitting progress to the Supervisor</li> </ul>                               | <ul style="list-style-type: none"> <li>Failed to accomplish the topic and indicated a lack of interest</li> </ul>   |
|   | <ul style="list-style-type: none"> <li>Cooperated with others well with alternative points of view(s)</li> </ul>  | <ul style="list-style-type: none"> <li>Usually listened and considered others with different points of view(s)</li> </ul>  | <ul style="list-style-type: none"> <li>Showed little or no empathy over others with different points of view(s)</li> </ul>  |
|   | <ul style="list-style-type: none"> <li>Managed time effectively, e.g. began immediately, connected work to assignment not to deadline and well-prepared over the whole project</li> </ul> | <ul style="list-style-type: none"> <li>Exhibited only occasional poor time management skills, e.g. began work early in process, but tended to increase effort toward deadline</li> </ul> | <ul style="list-style-type: none"> <li>Demonstrated a total lack of time management skills, e.g. always postponed work until deadline</li> </ul>                          |
|   | <ul style="list-style-type: none"> <li>Communicated effectively in fluent spoken and written English</li> </ul>   | <ul style="list-style-type: none"> <li>Communicated effectively in spoken and written English, though fluency could be improved</li> </ul>   | <ul style="list-style-type: none"> <li>Failed to communicate in spoken and written English, and most or all parts were difficult to be understood</li> </ul>              |
|   | <ul style="list-style-type: none"> <li>Demonstrated and respected ethical application of intellectual property and privacy</li> </ul>   | <ul style="list-style-type: none"> <li>Demonstrated an awareness of ethical application of intellectual property and privacy but references used were mostly excluded</li> </ul>         | <ul style="list-style-type: none"> <li>Showed detectable signs of academic misconduct in plagiarism or/and data fabrication</li> </ul>                                    |
| <b>Presentation &amp; Scientific Writing Skills (20%)</b>   | <ul style="list-style-type: none"> <li>Presented flawless report of details logically organized in accordance to the guidelines given</li> </ul>  | <ul style="list-style-type: none"> <li>Presented report with insufficient analysis and interpretation but was coherent in general</li> </ul>   | <ul style="list-style-type: none"> <li>Presented a poorly written report with very little information in data analysis and interpretation</li> </ul>                      |

### Rubric for Poster Presentation

| Assessment Criteria   | Exemplary (4-5)  | Satisfactory (2-3)  | Unacceptable (1)   |
|---|--|---|--|
| <b><u>Background Information</u></b><br>(5%)  | <ul style="list-style-type: none"> <li>Connected background information to demonstrate a sound understanding of the topic with explanation and elaboration</li> </ul>  | <ul style="list-style-type: none"> <li>Presented clear facts and information, and demonstrated a fair understanding of the topic, but further elaboration was needed</li> </ul>   | <ul style="list-style-type: none"> <li>Demonstrated a total lack of understanding of the topic with insufficient or irrelevant background information</li> </ul>   |
| <b><u>Organization</u></b> (5%)   | <ul style="list-style-type: none"> <li>Presented with logical organization and coherent information; allowed viewer to easily follow the flow throughout the presentation</li> </ul>   | <ul style="list-style-type: none"> <li>Presented with clear organization in most parts, but viewer might not be able to follow in some parts</li> </ul>   | <ul style="list-style-type: none"> <li>Lacked organization and coherence in presentation; viewer found it difficult to follow in most parts</li> </ul>   |
| <b><u>Presentation Skills</u></b> (5%)<br>- <i>Conveyance</i><br>- <i>Non-verbal Expression</i> | <ul style="list-style-type: none"> <li>Presented clearly focus of the contents throughout the poster presentation</li> <li>Showed outstanding presentation skills, including body posture, language, eye contact and voice, etc</li> </ul> | <ul style="list-style-type: none"> <li>Presented key ideas of the contents, though audience might get lost in some parts</li> <li>Showed good command of presentation skills, including language, eye contact and voice, etc</li> </ul> | <ul style="list-style-type: none"> <li>Failed to present key ideas of the contents; audience found it difficult to get the focus</li> <li>Showed poor presentation skills in most aspects, including body posture, language, eye contact and voice, etc</li> </ul> |
| <b><u>Question Handling</u></b> (5%)  | <ul style="list-style-type: none"> <li>Responded to questions fluently, precisely and persuasively; demonstrated a sound understanding of the topic</li> </ul>   | <ul style="list-style-type: none"> <li>Gave responses which basically addressed the questions; showed a fair understanding of the topic</li> </ul>  | <ul style="list-style-type: none"> <li>Gave responses which failed to address the questions; showed a lack of understanding of the topic</li> </ul>  |

Report submission due date: Last day of final examination of Spring term (unless otherwise advised by your supervisor)