

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

Rubric for Poster Presentation

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