

LabSkills Checklist (English Version)

No.	Grading Items	Student ID																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Proper wearing of lab coat, gloves, and safety goggles																				
2	Familiarity with lab rules and ability to correctly answer instructor's questions																				
3	Correct use of pipettes (accuracy $\pm 5\%$)																				
4	Proper use of graduated cylinders/pipettes for volume measurement																				
5	Proficiency in operating a centrifuge (balancing, setting, on/off)																				
6	Standardized use of a spectrophotometer and accurate data recording																				
7	Ability to correctly prepare buffers and solutions																				
8	Compliance with waste classification and disposal protocols																				
9	Keeping the workbench tidy with items neatly arranged																				
10	Complete documentation of raw data in lab notes																				
11	Following experimental procedures without significant omissions																				
12	Ability to independently complete key steps (e.g., SDS-PAGE loading)																				
13	Accurate reagent usage with minimal waste																				
14	Ability to distinguish and correctly select different lab equipment																				
15	Providing reasonable explanations for anomalies (e.g., result deviations)																				
16	Adherence to safety protocols (e.g., avoiding mouth pipetting, handling glassware carefully)																				
17	Active division of tasks and teamwork during group work																				
18	Timely completion of experimental operations																				
19	Reasonable and reproducible result data																				
20	Post-experiment cleanup and proper equipment storage																				
	Total Score																				

Grading Criteria: 0 = Unsatisfactory; 1 = Partially Satisfactory; 2 = Fully Satisfactory

实验室技能检查表（中文版）

序号	评分项目	学号																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	穿戴实验服、手套、防护眼镜是否规范																				
2	熟悉实验规章制度，能正确回答教师提问																				
3	正确使用移液器（精确度±5%）																				
4	正确使用量筒/移液管进行体积测量																				
5	熟练掌握离心机的操作（平衡、设置、开关）																				
6	能规范使用分光光度计并读取数据																				
7	能够正确配置缓冲液与溶液																				
8	遵守废液分类与处理规范																				
9	实验台保持整洁，物品摆放有序																				
10	实验笔记完整记录原始数据																				
11	按照实验步骤规范操作，无明显遗漏																				
12	能够独立完成实验关键步骤（如 SDS-PAGE 上样）																				
13	试剂使用准确，避免浪费																				
14	能区分不同实验器材并正确选择																				
15	遇到异常情况（如结果偏差）能提出合理解释																				
16	遵守安全规范（如避免口吸、注意玻璃仪器）																				
17	小组合作时能积极分工与配合																				
18	能按时完成实验操作																				
19	结果数据合理，重复性良好																				
20	实验后能清理器材并归位																				
	个人总分																				

评分标准：0=不符合，1=基本符合，2=完全符合

Data Interpretation Test (English Version)

No.	Grading Items	Student ID																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Analyze SDS-PAGE electrophoresis results and identify protein molecular weights corresponding to bands																				
2	Calculate K_m value from enzyme kinetic curves and explain its significance																				
3	Explain potential causes for abnormal experimental data																				
4	Compare blood glucose test results across different experimental groups and draw conclusions																				
5	Calculate sample concentrations based on spectrophotometric results and evaluate their validity																				
	Total Score																				

Grading Criteria: Scoring (20 points per item), 16–20 = correct with clear reasoning and error-free calculations/interpretation; 11–15 = largely correct with minor errors/omissions; 6–10 = partially correct with key gaps; 1–5 = limited response with major misconceptions; 0 = blank or fully incorrect.

数据记录测试表（中文版）

序号	评分项目	学号																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	分析 SDS-PAGE 电泳图，指出条带对应蛋白质大小																				
2	根据酶动力学曲线计算 Km 值并解释意义																				
3	解释实验数据异常的可能原因																				
4	比较不同实验组的血糖检测结果并得出结论																				
5	根据分光光度法结果计算样品浓度并判断合理性																				
	个人总分																				

评分标准：每题 20 分，16 - 20 分=答案正确、逻辑清晰、计算/解释无误；11 - 15 分=基本正确、存在小错或少量遗漏；6 - 10 分=部分正确、关键概念掌握不足；1 - 5 分=回答有限、理解存在明显偏差；0 分=未作答或完全错误。

LabReport Assessment (English Version)

No.	Grading Items	Student ID																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Clarity and accuracy of experimental objectives																				
2	Completeness and logical clarity of experimental procedures																				
3	Accuracy and standardized formatting of data recording																				
4	Clarity and compliance of figures and tables with scientific standards																				
5	Reasonableness and comprehensiveness of results analysis																				
6	Integration of theoretical concepts with experimental results in the discussion																				
7	Incorporation of clinical relevance in the analysis																				
8	Accuracy and conciseness of language expression																				
9	Proper formatting and accuracy of references																				
10	Overall formatting and completeness of the report																				
	Total Score																				

Grading Criteria: Scoring (10 points per criterion), 9–10 = fully meets requirements, clear structure, no salient errors; 7–8 = largely meets with minor shortcomings; 5–6 = partially meets with multiple deficiencies; 3–4 = falls short with missing key elements; 0–2 = not meeting expectations with severe omissions/errors.

实验报告评估表（中文版）

序号	评分项目	学号																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	实验目的是否清晰准确																				
2	实验步骤描述是否完整、逻辑清楚																				
3	数据记录是否准确、格式规范																				
4	图表绘制是否清晰、符合规范																				
5	结果分析是否合理、全面																				
6	讨论部分是否联系理论和实验结果																				
7	是否结合临床相关性进行分析																				
8	语言表述是否准确、简洁																				
9	引用文献是否规范																				
10	整体报告排版和完整性																				
	个人总分																				

评分标准： 每项 10 分：9 - 10 分=完全符合要求、结构清晰且无明显错误；7 - 8 分=基本符合、个别细节不足；5 - 6 分=部分符合、存在多处欠缺；3 - 4 分=不够符合、缺少关键要素；0 - 2 分=未达标、严重缺失或错误。

LearningSurvey Questionnaire (English Version)

No.	Dimension	Grading Items	Student ID											
			1	2	3	4	5	6	7	8	9	10		
1	Engagement	I carefully review the preparatory materials before the experiment.												
2	Engagement	I can stay focused throughout the experimental process.												
3	Engagement	I actively participate in group discussions and share my opinions.												
4	Engagement	I ask questions proactively to teachers or peers.												
5	Engagement	I continue to review and organize knowledge after the experiment.												
6	Self-regulated learning	I can arrange my study time before the experiment reasonably.												
7	Self-regulated learning	When encountering problems, I actively consult additional resources.												
8	Self-regulated learning	I set specific goals for my experimental learning.												
9	Self-regulated learning	I can evaluate my own learning outcomes and make adjustments.												
10	Self-regulated learning	I have strong self-motivation during the learning process.												
11	Satisfaction	I am satisfied with the teaching model of this course.												
12	Satisfaction	The experimental course helps me better understand theoretical knowledge.												
13	Satisfaction	I think the course design is reasonable and the workload is appropriate.												
14	Satisfaction	I believe the classroom atmosphere is conducive to learning.												
15	Satisfaction	I would recommend this teaching model to other students.												

Grading Criteria: Each item is scored from 1 to 5, and the score for each dimension is calculated as the average of its items. A 5-point Likert scale is used: 1 = strongly disagree, 5 = strongly agree.

学习调查问卷（中文版）

序号	维度	评分项目	学号																	
			1	2	3	4	5	6	7	8	9	10								
1	学习投入	我在实验前会认真阅读预习材料。																		
2	学习投入	实验过程中我能够全程专注于任务。																		
3	学习投入	我积极参与小组讨论并发表自己的意见。																		
4	学习投入	我会主动向教师或同学提出问题。																		
5	学习投入	实验课结束后我仍会复盘和整理知识。																		
6	自主学习	我能够合理安排课前的学习时间。																		
7	自主学习	遇到不懂的问题时，我会主动查阅资料。																		
8	自主学习	我会为实验学习设定具体目标。																		
9	自主学习	我能够评价自己的学习效果并进行调整。																		
10	自主学习	我在学习过程中有较强的自我驱动力。																		
11	满意度	我对本课程的教学模式感到满意。																		
12	满意度	实验课程帮助我更好地理解理论知识。																		
13	满意度	我觉得课程设置合理，学习负担适中。																		
14	满意度	我认为课堂氛围有利于学习。																		
15	满意度	我愿意向其他同学推荐这种教学方式。																		

评分标准： 每项 1-5 分，每个维度按每项平均分，采用 Likert 五点量表，1=完全不同意，5=非常同意。

Interview Guide (English version)

《Semi-structured Interview Guide for Blended Learning in Biochemistry Laboratory Courses》

Purpose:

To explore students' perceptions of blended learning in the biochemistry laboratory course, focusing on preparation, integration of theory and practice, and perceived relevance to clinical training.

Interview Questions:

1. Pre-class preparation

How did you use the online micro-lectures, quizzes, and reading materials before the laboratory class?

To what extent did these resources help you prepare for the experiments?

2. Integration of theory and practice

In what ways did the blended learning approach help you connect theoretical knowledge with laboratory practice?

Can you provide an example where you felt theory and practice were well integrated?

3. Three-station rotation model

What was your experience with the three-station rotation (laboratory operation, data analysis, clinical case discussion)?

Which station did you find most beneficial, and why?

4. Group collaboration and discussion

How did the group discussions contribute to your learning?

Did you feel comfortable sharing your ideas and questions during the process?

5. Perceived clinical relevance

To what extent did this teaching model help you understand the clinical relevance of biochemistry experiments?

Do you think it improved your ability to apply biochemistry knowledge in clinical contexts?

6. Overall evaluation

Compared with traditional laboratory teaching, what do you see as the strengths and weaknesses of the blended learning approach?

What suggestions would you give for improving this teaching model?

访谈提纲（中文版）

《半结构化访谈提纲：生物化学实验课程中的混合式学习》

访谈目的：

了解学生对生物化学实验课程混合式教学模式的体验和看法，重点关注课前准备、理论与实践的结合以及临床相关性。

访谈问题：

1. 课前准备

你是如何利用实验前的线上微课、测验和阅读材料的？

这些资源对你准备实验有什么帮助？

2. 理论与实践结合

在实验学习中，混合式教学在哪些方面帮助你更好地将理论知识与实验操作联系起来？

能否举一个你认为理论和实验结合得比较好的例子？

3. 三站轮转模式

你在三站轮转（实验操作、数据分析、临床案例讨论）中的体验如何？

哪一站对你帮助最大？为什么？

4. 小组合作与讨论

小组讨论在你的学习过程中发挥了什么作用？

你在讨论中是否愿意提出问题或发表意见？

5. 临床相关性

这种教学模式在多大程度上帮助你理解生物化学实验与临床的联系？

你觉得它是否提升了你将生物化学知识应用到临床情境的能力？

6. 整体评价

与传统实验教学相比，你觉得混合式教学模式的优点和不足分别是什么？

你有哪些改进建议？