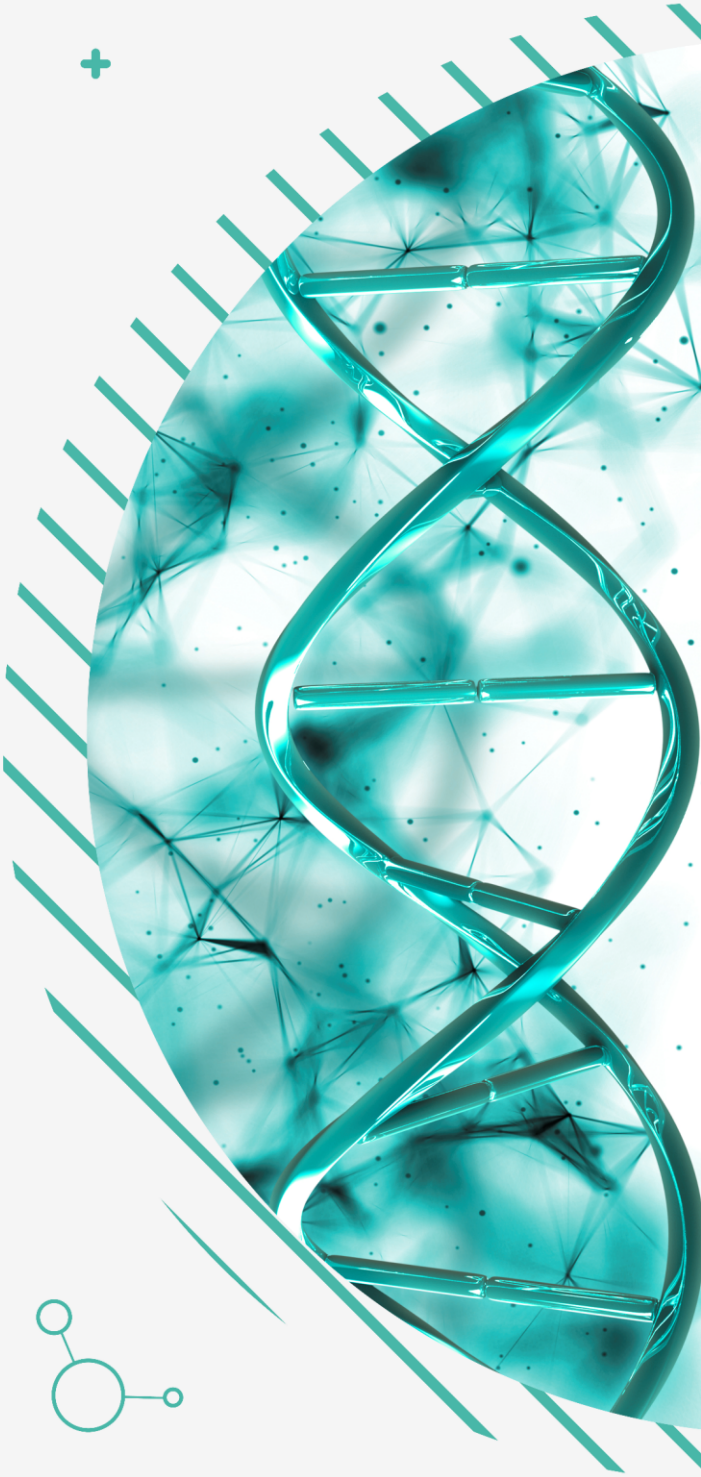
جامعة تبوك
University of Tabuk

Field Experience Course Guide In biochemistry BIOC 404



Content

Introduction

Biochemistry

Biochemistry is a branch of natural science that focuses on the study of chemical processes and chemical compounds occurring in living organisms and biological systems. Biochemistry is concerned with understanding the chemical reactions that occur within cells and how they affect the functions of organisms and living organizations.

Field Training

It is a set of skills and experiences that are provided to the student in one of the fields of research and work for a biochemistry graduate, implemented within an organized plan within a specific period determined by the college in order to empower students and qualify them for the labor market through the practical application of what has been acquired from science and knowledge during the semester.

The work of biochemists:

Biochemists are scientists and researchers working in the field of biochemistry. Their main function is to study and understand the chemical processes occurring in living organisms and the impact of these processes on human health and the environment. **Biochemists perform the following activities and tasks:**

- **Scientific research:** They conduct scientific research and experiments to understand the interactions of molecules, genes, and proteins in living cells. This research aims to uncover the chemical and molecular mechanisms that govern biological processes.
- **Drug design:** They develop and test drugs and chemical compounds that are used to treat various diseases. They aim to improve our understanding of disease and develop effective treatments.
- **Development of analytical techniques:** They develop and use advanced analytical techniques such as spectroscopy and chromatography to examine and measure chemical compounds and biomolecules in biological samples.
- **Environmental impact study:** They investigate the impact of chemicals on the environment and living organisms and seek to understand how to minimize negative impacts on the environment.

- **Education and teaching:** They teach biochemistry and related sciences at universities and other educational institutions and participate in the training of new students and researchers.

They also work in a variety of sectors including academic research, pharmaceuticals, biotechnology, clinical research, agriculture, environment, chemical analysis, public health, and many other fields that rely on a deep understanding of biochemistry.

Areas of research and interest in biochemistry include:

- **Structure of biomolecules:** study of the composition and structure of biological molecules such as proteins, nucleic acids (RNA and deoxyribonucleic acid) and carbohydrates.
- **Chemical reactions in cells:** Understand the chemical processes that occur inside cells such as metabolic reactions, free radical embedding, and cellular transport processes.
- **Genome and genomics:** the study of the structure, genetic function and whole genomes of living organisms.
- **Enzymes:** Understand how enzymes work in accelerating chemical reactions in the body.
- **RNA and associated technologies**: such as gene editing technology using CRISPR-Cas9.
- **Medical applications:** the use of biochemistry in the development of drugs and the treatment of diseases.

Biochemistry plays a crucial role in understanding how biology works and how they evolve, and it forms an essential part of scientific research and development in fields such as health, industry, and the environment.

Field Research Objectives for Biochemistry Students

The objectives of field research in biochemistry depend on a variety of factors including students' interests and current challenges in the field of biochemistry. However, the main objectives of field research in biochemistry can be summarized as follows:

- **Understanding Biochemical Reactions:** Field research in biochemistry aims to understand the interactions and processes of molecules, proteins, and nucleic acids within living cells. This includes the study of metabolic mechanisms, cellular digestion processes, genetic coding processes, and cellular signals.

- **Drug Development:** Field research in this area aims to develop new and effective drugs to treat a variety of diseases such as cancer, infectious diseases, and neurological diseases. This includes designing chemical compounds that target specific biological targets in the body.
- **Genomic Technology:** Field research in this area aims to develop genome screening techniques and understand genetics and how genetic changes affect health and disease.
- **Study of proteins and biochemical structure:** The research aims to understand the biochemical structures and functions of proteins and how they interact with other compounds in cells.
- **Environmental Solutions and Sustainability:** Research in this field addresses the impact of chemical compounds on the environment and environmental sustainability, and seeks to develop solutions to environmental problems and reduce harmful impacts.
- **Basic and applied research:** Field research in biochemistry can include basic research aimed at understanding new concepts in science, and also applied research aimed at applying biochemical knowledge to solve specific problems.
- **Improving techniques and methods:** Researchers are developing cutting-edge chemical and biological analysis techniques and tools that help achieve the goals of bioresearch.

Overall, the primary goal of field research in biochemistry is to enhance our understanding of biological processes, improve human health and the environment, and develop practical applications.

Field Research Time Plan

In agreement with the training authority, students should be trained in stages and for at least 15 weeks.

Phase 1	**Preparation**
Phase 2	Follow-up
Phase 3	Implementation
Phase 4	Evaluation

Field Research Course Learning Outcomes in Biochemistry

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Describe different biochemical concepts and their use in the training in the field of biochemistry.	K1
1.2	Demonstrate knowledge of well-known spezialised training and methods used in biochemistry research.	K2
2	**Skills:**	
2.1	Evaluate ideas learned in lecture courses with skills learned in laboratories to formulate hypotheses.	S1
2.2	Apply theoretical and practical experience to use biochemical concepts and research skills to design and execute scientific research and analysis.	S2
2.3	Communicate effectively with people and instructors.	S3
3	**Values:**	
3.1	Adopt commitment to professional and academic values, standards and ethical codes of conduct, and represent responsible citizenship and co-existance with others.	V1
3.2	Engage in academic and professional self-development to evaluate own learning and performance.	V2
3.2	Demonstrate responsibility, confidence and time management for prioritizing tasks to increase productivity.	V3

Skills acquired from field research.

Conducting field research in the field of biochemistry can contribute to the acquisition of a variety of valuable skills that benefit students in the field of science and research in general.

Skills that can be acquired through field research in biochemistry:

- **Analysis and interpretation skills**: Student researchers learn how to collect and analyse data accurately, how to interpret results and reach significant conclusions from them.
- **Planning and design skills:** Develop the skills of planning and designing experiments so that they are highly accurate and respond to the specific objectives of the research.
- **Science communication skills**: The ability to express their ideas and research findings clearly and understandably, whether through writing scientific reports or making presentations.
- **Research and investigation skills**: The ability to search for references and scientific literature related to the specific problem and evaluate it based on scientific criteria.
- **Skills of dealing with scientific equipment and techniques:** Acquire skills in the use of various tools and techniques used in chemical and biological research.
- **Teamwork skills: collaboration with a** team, ability to work effectively in a group and communicate and collaborate with colleagues.

- **Flexibility and problem solving:** Facing unexpected challenges and problems during field research and devising solutions to these problems.
- **Commitment to research ethics**: Knowledge of the principles of research ethics and correct scientific behaviour.

Field Research Requirements

The student must meet the following conditions:

- The student must pass all courses for the sixth and seventh levels
- The student's academic status in the electronic portal must be regular
- The academic load during the field research semester should not exceed 16 hours
- The student devotes himself to training at least two days a week

Training Organizations

- Hospitals and medical laboratories (King Khalid Hospital, Maternity and Children Hospital)
- Pharmaceutical Industry (Tabuk Pharmaceutical Industries Company)
- Approved poison control centers in the Kingdom of Saudi Arabia
- Health Services Laboratories
- Forensic Laboratories

Responsibility during the field research period

Responsibilities of the academic supervisor

- Continuous monitoring of the student at his/her training headquarters to ensure that the appropriate environment is available in the training entity.
- Communicate with the supervisor of the training authority and monitor the development of the student and his/her discipline.
- Support students during the training period to ensure that they benefit from the training programmes, guidance and assistance when necessary.
- Submission of field reports and follow-up to the Scientific Department

Responsibilities of the Field Training Supervisor

- Follow-up on the student's commitment to attend during the scheduled hours of training.
- Evaluation of trainee performance during training

Student's Responsibilities

After fulfilling the conditions of field research, the student is committed to

- Sign the pledge form to abide by the training regulations.
- Fill out the training commencement form: It is filled out and sealed by the field supervisor and sent to the academic supervisor during the first week.
- Commitment to professional work ethics and public behaviour, and the training authority has the right to apply its own penalties to the trainee in the event of a violation of public behaviour and morals.
- Commitment to attend full training hours throughout the training period and be signed in the signature statements.
- Handing the attendance and absence statements to the field training supervisor.
- Students with an absence rate exceeding 25% of attendees are denied training.
- Students are committed to good behaviour and interaction with the training team and colleagues in the group.
- Students submit their final report at the end of training that includes the date and number of training days, the names of the devices used, the function of each device, the number of samples that were trained, the quality of the analyses that were conducted in the trainee entity, as well as the analytical processes, explaining the type of data and programs used by the student if any, as well as the pros and cons of the training entity with writing the name, university number, place of training and the name of the training supervisor, and handing the report (printed) to the academic supervisor.
- In the event of a presentation, students are evaluated before the training evaluation and discussion committee.
- The student must submit a report to the academic supervisor, and in the event that it is not delivered, the student is treated as an absentee from the test in a subject, either an excuse is brought, or a rejection is made.
- In the event that the student is not present at the training site during the visits, and it is difficult to reach him more than once, he is registered absent and the student is warned, and in the event of repeated absence (without an acceptable justification), the student is deprived of training.
- At the end of the training students provide a presentation or poster evaluated by the Training Evaluation Committee.

Elements of Field Research Course Evaluation

valuator	Rating score	Evaluation
Academic Supervisor	40	Weekly Assessment (Practical work report)
Evaluation Committee	20	Presentations or poster
Field Training Supervisor	20	Evaluation of the training entity
Evaluation Committee	20	Final Report (Practical work)
	100	Total

Field Training Forms

Students/Trainee Forms

Application form for field training

Student's Information	
Student's Name:	Graduation semester and year:
Student's ID:	GPA:
Mobile number:	Completed hours:
E-mail:	Signature:
Department:	Date:

Information about the training provider	
Training Duration:	Training provider:

The duration of training is agreed upon with the training body and according to the student's schedule.

Filled out by the training coordinator in the department			
Deserve training	☐	Yes	☐ No
Training coordinator name:			
Signature:			
Date:			

A form of commitment to comply with field training systems and regulations.

Student's Information	
Students name	
Students ID	
Department	

I, the student whose information is mentioned above, acknowledge that I will abide by the conditions and instructions stated below:

- Review all requirements of the study program, as well as the requirements of the department and college regarding training.
- Receive all training-related forms before starting training.
- I pledge not to change the entity after obtaining official approval.
- I must commit to attending the entire work training period according to the dates specified for each entity in which I will be training.
- I work to inform the academic supervisor as well as the field training supervisor in the entity immediately when I do not attend practical training, or are absent from it for any circumstances, and I bear full responsibility for the consequences of my absence from training.
- I adhere to Arab and Islamic customs and traditions during my presence at the training agency's headquarters.
- To make every effort to live up to the level of work assigned to me during the practical training period.
- I commit to performing my duties to the fullest extent, and to respond to the directions of my field supervisor regarding my training.
- I take responsibility for my behaviour during my training period, and absolve any party, regardless of this responsibility.
- Submitting the required forms to the field supervisor, which is a form for starting training during the first week and sending the training plan for the training agency within two weeks from the beginning of the training.
- Commitment to submit the following forms to the academic supervisor: the final training report, the training certificate from the training authority, and the final training offer.
- Commitment to submit the following forms to the academic supervisor: the final training report, the training certificate from the training authority, and the final training offer.

  I understand and pledge to abide by everything stated in this declaration, and I hereby sign it.

Student's Name:

Signature:

Date:

Student entity form for field training.

To be filled out by the training provider

	Student's name	Students ID	Department	Entity date
1				
2				
3				
4				
5				

Training provider/ supervisor information	
Name:	**Position:**
e-mail:	**Training provider:**
Signature:	**Date:**
Mobile number:	

Training facility seal:

Academic Supervisor Forms

Academic Supervisor Follow-up Form for Field Training

Student's information:

Student Name		University ID	
Specialization		Semester	
Training Entity		Academic Supervisor	
Internship Period	From: / / e to : / / e		

Evaluation criteria for student performance	**5 Premium**	**4 Very good**	**3 Good**	**2 Acceptable**	**1 weak**
The level of scientific skills acquired by the student and the suitability of the training program for specialization.					
The level of work experience acquired by the student.					
The level of communication between the student and the supervisor during the training period.					
General evaluation of student performance and the quality of the technology used at the training site.					
Total score out of 20.					
Writing a 10-degree report.					
Jury discussion of 20 degrees).					

Depends

Course Academic Supervisor:

Name:

Signature:

President/Chairperson section:

Name:

Signature:

Report Evaluation Form

(Weekly)

Student Data:

Student Name		University ID	
Specialization		Semester	
Training Entity		Academic Supervisor	
Internship Period	From: / / e to: / / e		

Training Report Evaluation Criteria	Full Grade	Degree obtained
Language level used	2	
The clarity of the content of the report and its scientific level	2	
Logical order of parts of the report	2	
Comprehensiveness of the report for all aspects of training	2	
Form and feel of the report	2	
Total	10	

Name of the member of the evaluation committee	Signature	Date

Field Training Final Evaluation Form

Student Data:

Student Name		University ID	
Specialization		Semester	
Training Entity		Academic Supervisor	
Internship Period	From: / / e to: / / e		

Academic Supervisor Evaluation	The training entity evaluates	Committee Evaluation
60	20	20
Total from 100		

Depends

Course Academic Supervisor:

Name:

Signature:

President/Chairperson section:

Name:

Signature:

Training provider forms

Signature form for the student's attendance and departure in the field training

Faculty:		**Academic Department:**	
Student's Name		**:Mobile**	

No.	Date	Attendees Signature	Departure Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

No.	Date	Attendees Signature	Departure Signature
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			

Note: Thestudent is part-time for training so that the training is a morning period (according to the agreed schedule) and in case of emergency circumstances, the student submits a written excuse to the field supervisor.

Field Supervisor:		:Signature	

Trainee evaluation form in periodic follow-up

Name of Trainee		اسم المتدرب:
Student's ID:		الرقم الجامعي للمتدرب:
Academic Department:		القسم الأكاديمي:
Academic Year		العام الجامعي:

Trainee's General Performance (Please put appropriate mark in the box)			الأداء العام للمتدرب (الرجاء وضـــع الدرجة التي يســتحقها الطالب لكل عبارة من العبارات الواردة الجدول)		
Elements of Evaluation					عناصر التقييم
Punctuality of the trainee in attendance through periodical follow-up		3	3		انتظام المتدرب في الحضور
The student's ability to accommodate skills of training with teamwork		3	3		استعيان المتدرب مهارات التدريب
Student care in appearance and dealing		2	2		تعامل المتدرب بطريقة مناســبة والتزامه بالمظهر المهني
Improve trainee performance is constantly		2	2		التحسن في اداء التدريب
Total		10	10		المجموع

Total Marks		الدرجة النهائية
Comments		ملاحظات
Training Supervisor		المشرف الميداني

Date:…….

Field Training Entity Final Evaluation Form (Confidential)

Name of Trainee:			اسم المتدرب
Student's ID			الرقم الجامعي للمتدرب
Academic Department			القسم الأكاديمي
Name of Organization			اسم جهة التدريب
Time of training	Starting at: to:	من الساعة: إلى:	الوقت المخصص للمتدرب

Trainee's General Performance (Please put appropriate mark in the box)			الاداء العام للمتدرب (الرجاء وضـع الجرحة التي يسـتحقها الطالب لكل عبارة من العبارات الواردة الجدول)		
Elements of Evaluation Teamwork: -1					عناصر التقويم 1- السلوك المهنية
Listen to given instructions, complete assigned tasks in timely manner		2	2		الالتزام بالتعليمات واستكمال المهام المسندة في الوقت المناسب
Effectively coordinate tasks with other team members		1	1		تنسيق المهام مع اعضاء الفرق الاخرى بفعالية
Punctual attendance of regular meetings		1	1		الحضـــور في الوقت المحدد للاجتماعات واللقاءات المنتظمة
Communicate effectively with assigned supervisors, team members and other stake holders		1	1		التواصـل الفعال مع المشـرفين المختصـين، واعضـاء الفرق أثناء فترة التدريب
2. Training Experience/Knowledge:			العلاقات المهنية		
Ability to Comfortably employ conceptual knowledge in the field of specialization and the basic principle of science to complete assigned tasks with minimal supervision.		5	5		القدرة على تحقيق المعرفة والمفاهيم الأســاســية في مجال التدريب بدقة وشمولية.
Ability to design assigned experiments, observe and record measurements, operation of appropriate test and experimental equipment's, analyse and interpret data		5	5		القدرة على المراقبة وتســجيل القياســات، وتحليل وتفسير البيانات للمعدات التجريبية
Total		20	20		المجموع الكلي

Total Marks			الدرجة النهائية

Comments	ملاحظات

Training Supervisor			المشرف الميداني

Date:…….

Training supervisor's feedback form

Company Name | Field Training Program

Supervisor's Name | Supervisor's Signature optional

Please use the scale below to rate the following qualities and attributes of the trainee.

Excellent – Very Good – Good – Fair – Poor

Statements	Rating
Pre Field-Training Arrangement	
1. Student was eligible to register at the Field Training at your company according to his field of study	
2. Student joined the co-op training program at your company on the prescribed date and time	
3. Student's Field Training required papers were sent to you before deadlines	
4. Student was sufficiently motivated to take the Field Training program	
5. Student understands the purpose of the Field Training and the relevant rules and regulations	
6. Your communication with the College's Field Training Coordinator was satisfactory and on regular basis. Basis	
During Field Training Program	
7. Student was punctual during Field Training period	
8. Effectively develops and uses resources (people, time, money, supplies, equipment and space) to improve organizational performance	
9. Handles Field Training related problems in an organized, confident, and decisive manner	
10. Conveys priorities with the proper sense of urgency and importance	
11. Exhibits behaviour that is consistent with the company's policy	
12. Fulfils tasks and submits the required documents or reports on time	
13. Does what is required, not what is comfortable	
14. Student follows the work plan as per schedule	
15. Regularly gets signature on his/ her weekly evaluation report (Weekly Log Sheet)	
Post Field Training Program	
16. Student successfully established self-discipline and confidence and acquired proper work ethics	
17. Training obtained during Field Training is expected to be useful for student's future professional life	

Please provide any additional comments on the back of this form

(Company Letter Head)

CERTIFICATE FROM FIELD TRAINING

This is to certify that Mr/Ms_____

ID NO. has completed his/her_____,

Field Training, from

_____to_____

Name of the Training Supervisor:

Signature:

Date:

Training facility seal: