

## Course Description Form

<b>1. Course Name:</b>					
Pharmaceutical Biotechnology (Theoretical)					
<b>2. Course Code:</b>					
Phind23 5214--					
<b>3. Semester / Year:</b>					
2 <sup>nd</sup> Semester/5 <sup>th</sup> year					
<b>4. Description Preparation Date:</b>					
01/2/2024					
<b>5. Available Attendance Forms:</b>					
Students' signature on attendance sheet					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
1 hours Theoretical /1 units					
<b>7. Course administrator's name</b>					
Theoretical					
Name: Assist. Prof Dr. Mohanad Alfahad Email: <a href="mailto:dr.ma.alfahad@uomosul.edu.iq">dr.ma.alfahad@uomosul.edu.iq</a>					
<b>8. Course Objectives</b>					
<p><b>Course Objectives</b> Identify the most common therapeutic peptides and proteins derived from biotechnological sources. Knowing structure details, formulation requirements, and pharmacist role.</p>					
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>		Lecturing Homework Quiz			
<b>10. Course Structure</b>					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	1	Importance and Definition of Biotechnology  History of Biotechnology derived product	Biotechnology - introduction	Theoretical lectures.	Paper-based exams
2	1	Recombinant DNA biotechnology.	Formulation biotechnology product (biopharmaceutical consideration)	Theoretical lectures.	Paper-based exams
3	1	Sterilization (chemical + physical Methods). Chemotherapy.	Microbial consideration- sterilization, pyrogen decontamination	Theoretical lectures.	Paper-based exams

4	1	Types and specification of excipients used in biotechnological formulation	Excipients of parenteral products - solubility enhancer-adsorption agents - buffer components - preservatives - osmotic agents.	Theoretical lectures.	Paper-based exams
5	1	Types and specification of excipients used in biotechnological formulation	Excipients of parenteral products - solubility enhancer-adsorption agents - buffer components - preservatives - osmotic agents.	Theoretical lectures.	Paper-based exams
6	1	Formulation requirements according to route of administration	Route of administration Parenteral route Oral route.	Theoretical lectures.	Paper-based exams
7	1	Formulation requirements according to route of administration	Route of administration Parenteral route Oral route	Theoretical lectures.	Paper-based exams
8	<b>Mid-term exam</b>				
9	1	Formulation requirements according to route of administration	Route of administration Parenteral route Oral route	Theoretical lectures.	Paper-based exams
10	1	Formulation requirements according to route of administration	Route of administration Alternative routes (nasal-pulmonary-rectal-buccal transdermal)	Theoretical lectures.	Paper-based exams
11	1	Formulation requirements according to route of administration	Route of administration Alternative routes (nasal-pulmonary-rectal-buccal transdermal)	Theoretical lectures.	Paper-based exams
12	1	ADME of peptides and proteins Assessments and relationship to pharmacodynamics action	Pharmacokinetic of peptides and proteins (Elimination of proteins (proteolysis excretion-metabolism)	Theoretical lectures.	Paper-based exams
13	1	ADME of peptides and proteins Assessments and relationship to pharmacodynamics action	Pharmacokinetic of peptides and proteins (Elimination of proteins (proteolysis excretion-metabolism)	Theoretical lectures.	Paper-based exams
14	1	ADME of peptides and proteins	Pharmacokinetic of peptides and proteins	Theoretical lectures.	Paper-based exams

		Assessments and relationship to pharmacodynamics action	( Elimination of proteins (proteolysis excretion-metabolism)		
15	<b>Question and answers (Course review)</b>				
<b>11. Course Evaluation</b>					
<ul style="list-style-type: none"> <li>• 30 M Theoretical assessments; (paper-based mid-term exam)</li> <li>• 70 M paper-based theoretical final exam</li> </ul> <hr style="width: 20%; margin-left: 0;"/> <p style="margin-left: 20px;">100 M total</p>					
<b>12. Learning and Teaching Resources</b>					
Required textbooks			1. pharmaceutical biotechnology Crommelin, Robert D. Syinder		
Main references (sources)			1. pharmaceutical biotechnology Crommelin, Robert D. Syinder		
Electronic References, Websites					