



## Course Specifications

<b>Course Title:</b>	<b>Natural Products</b>
<b>Course Code:</b>	<b>2044111-2</b>
<b>Program:</b>	<b>Bachelor in Chemistry</b>
<b>Department:</b>	<b>Department of Chemistry</b>
<b>College:</b>	<b>College of Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 2 (Theoretical)
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 8 <sup>th</sup> Level/ 4 <sup>th</sup> Year
<b>4. Pre-requisites for this course (if any):</b> NA
<b>5. Co-requisites for this course (if any):</b> NA

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	24	80 %
2	Blended	6	20%
3	E-learning	-	-
4	Distance learning	-	-
5	Other	-	-

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	24
2	Laboratory/Studio	-
3	Tutorial	-
4	Others (Blended)	6
	<b>Total</b>	<b>30</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

The course emphasis on types of natural products that are found in living organisms of plant and animal. It describes how to extract natural products and to identify the chemical composition by different physical and chemical methods. It introduces the study of some classes of terpenoids, alkaloids and steroids.

### 2. Course Main Objective

The emphasis on extraction, identification and synthesis of different classes of natural products.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding:</b>	
1.1	Recognize the basic methods for organic compounds' identification.	K1
1.2	Describe the general properties and classification of the natural products	K2
<b>2</b>	<b>Skills:</b>	
2.1	Apply the rules of extraction and identification for natural products.	S1

CLOs		Aligned PLOs
2.2	Utilize chemical concepts in synthesis of natural products	S3
<b>3</b>	<b>Values:</b>	
3.1	Participate in the development of the performance of work teams	V1
3.2	Represent the academic ethics and responsibility	V2

### C. Course Content

No	List of Topics	Contact Hours
1	Introduction to natural products chemistry; Classification of Terpenoids; Extraction methods	2
2	General methods for structure determination; Acyclic monoterpenes (Examples: Myrcene, Citral and Geraniol (structure identification and preparation))	4
3	Monocyclic monoterpenes ( $\alpha$ -Terpeniol; structure identification and preparation)	4
4	Bicyclic monoterpenes ( $\alpha$ -Pinene); Acyclic Sesquiterpenes (Farnesene); Acyclic Diterpenes (Phytol); Monocyclic Diterpenes (Vitamin A): structure identification and preparation	4
5	Triterpenes (Squalene); Tetraterpenes (Carotene, Lycopene); Polyterpenes (Rubber): structure identification and preparation	2
6	Classification and General methods of structure identification of Alkaloids	2
7	Phenyl ethylamine group: Adrenaline (structure identification and preparation)	4
8	Pyrolidine group: Hygrene (structure identification and preparation)	2
9	Pyrolidine-pyridine group: Nicotine (structure identification and preparation)	2
10	Steroids: identification, nomenclature and classification. Examples: Cholesterol, Sex hormones (structure identification and preparation)	4
<b>Total</b>		<b>30</b>

### D. Teaching and Assessment

#### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	Recognize the basic methods for organic compounds' identification.	Lecture	Written Exam
1.2	Describe the general properties and classification of the natural products	Lecture	Written Exam
<b>2.0</b>	<b>Skills</b>		
2.1	Apply the rules of extraction and identification for natural products.	Discussion	Homework Assignments
2.2	Utilize chemical concepts in synthesis of natural products.	Problem-Solving	Homework Assignments
<b>3.0</b>	<b>Values</b>		
3.1	Participate in the development of the performance of work teams	Collaborative Learning	Individual presentations
3.2	Represent the academic ethics and	Collaborative	Individual

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	responsibility	Learning	presentations

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework Assignments (Electronic)	Throughout Semester	15%
2	Individual presentations	Throughout Semester	5%
3	Periodical Exam	7/8	15%
4	Mid Term Exam	11/12	15%
5	Final exam	16	50%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

### Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Commitment to the rules of the Academic Advising Department at the university in accordance with the academic guidance manual approved by the university and the attached forms, there are different arrangements made by teaching staff to support student consultations including;

- Office hours: 8 hours per a week for each academic member.
- Academic guidance: an academic member has a number of students to guide them throughout degree journey.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<ul style="list-style-type: none"> <li>• <a href="#">Chemistry of Plant Natural Products</a>, Sunil Kumar Talapatra, Bani Talapatra (2015). Springer Nature Switzerland, Latest Edition. ISBN: 978-3-642-45410-3.</li> </ul>
<b>Essential References Materials</b>	<ul style="list-style-type: none"> <li>• <a href="#">Natural Products</a>, Hassan Mohamed Alhazmi, 2013, Alkhareji for Publishing and Distribution (KSA), Latest Edition. ISBN: 22/1285.</li> <li>• <a href="#">Medicinal Natural Products: A Biosynthetic Approach</a>, Paul M. Dewick, 2009, Latest Edition. John Wiley &amp; Sons, Ltd. (USA). ISBN: 978-0-470-74168-9.</li> </ul>
<b>Electronic Materials</b>	<ul style="list-style-type: none"> <li>• <a href="#">Saudi Digital Library (SDL)</a></li> </ul>
<b>Other Learning Materials</b>	<ul style="list-style-type: none"> <li>• <a href="#">Learning Management System (Blackboard)</a></li> <li>• Computer programs for graphing organic compounds and chemical reactions (Chem draw , Chem sketch)</li> </ul>

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"><li>Lecture hall with 100 seats.</li></ul>
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"><li>Computer and data show with Wi-Fi access</li><li>ChemDraw and Chem sketch software</li></ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	--

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching and assessment	Students	Survey (indirect method)
Extent of achievement of course learning outcomes	Program leader	Reports (Direct method)
Quality of learning resources	Peer referees Students	Reports (Direct method) Survey (indirect method)

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	Department Council/ Quality assurance committee
<b>Reference No.</b>	7-3-1445
<b>Date</b>	27/2/1445 HJ 12/09/2023 G