# Course Specification of Medicinal Botany

| I. Course Identification and General Information: | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Course Title: | Medicinal Botany | | | | |
| 2 | Course Number & Code: | Ph331 | | | | |
| 3 | Credit hours: | C.H | | | | Total |
| | | Theoretical | Practical | Training | Seminar | |
| | | 2 | 2 | | | 3 |
| 4 | Study level/ semester at which this course is offered: | 2nd level /1st semester | | | | |
| 5 | Pre –requisite (if any): | None | | | | |
| 6 | Co –requisite (if any): | None | | | | |
| 7 | Program (s) in which the course is offered: | Bachelor of Pharmacy | | | | |
| 8 | Language of teaching the course: | English | | | | |
| 9 | The department in which the course is offered: | Department of Pharmacognosy | | | | |
| 10 | Location of teaching the course: | Faculty of Pharmacy | | | | |
| 11 | Prepared by: | Dr. Bushra Moharam | | | | |
| 12 | Date of approval: | | | | | |

## II. Course description:

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It is an introduction to the scientific study of plant life. This course is to evaluate and understand plant physiology processes, forms, reproduction, morphology and anatomy and how higher plants named and classified. Students will have a basic information in Botany (e.g. Systematic Botany; Plant Morphology and Anatomy and Plant Physiology) with special attention to the pharmaceutical importance of various organisms belonging to plant kingdom. This course will enable students to learn about the biology of medicinal plants, and gain insight as to what makes them useful in treating diseases.

## I. Intended learning outcomes (ILOs) of the course:

1. Describe the characters of plant cell and different tissues and organs and list the differences between their structures.
2. Explain terminology, nomenclature and classification system in general botany.
3. Explain main concepts of taxonomy
4. Describe different macroscopical and microscopical characters of different medicinal plant parts (e.g. roots, stems, leaves, flowers and fruits) with their pharmaceutical importance
5. Draw parts of plant (leave, flower, seeds, fruits…etc)
6. Recognize the different pathways and metabolism present in plant
7. Distinguish different plant cell types, plant tissues and apply acquired knowledge to identify different plant tissues and organs based on anatomical characters.
8. Classify plant samples according to their morphological and anatomical characters.
9. Identify different cells and its function.
10. Assess the relevance and importance of plant morphology characters to plant identification
11. Handle and dispose chemicals safely
12. Manipulate pharmaceutical instruments and equipment safely and efficiently (microscopes, pipettes, slides and cover slips, ……etc.)
13. Integrate different morphological and anatomical aspects to conclude a scientific classification of plants
14. Apply acquired information to describe morphological characters of real life samples.
15. Apply information technology skills to prepare complete and clear scientific report.
16. Work effectively as a part of a team and independently to perform the required tasks.
17. Develop information technology (IT) skills
18. Acquire effective time-management skills

## II. Intended learning outcomes (ILOs) of the course:

## (A) Knowledge and Understanding:

**Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Knowledge and Understanding.**

| Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding | | Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding | |
|---|---|---|---|
| After completing this program, students will be able to: | | After completing this course, students will be able to: | |
| **A1-** | Recognize the principles of physical, chemical, social, behavioral, health and tissues and organs and their structures. | **a1-** | Describe the characters of plant cell and different clinical, and list the differences between pharmaceutical sciences. |
| **A4-** | Recognize the pharmaceutical dosage form formulations according to GMP and the **a4** Describe different macroscopical and microscopical characters of different medicinal plant parts (e.g. roots, stems, leaves, flowers and fruits) with their pharmaceutical importance | **a2-** | Explain terminology, nomenclature and classification design and the quality control of pharmaceutical system in general botany, **a3-** Explain main concepts of taxonomy pharmacopeial requirements to support pharmaceutical industries and research. |
| | | **a5** | Draw parts of plant (leave, flower, seeds, fruits…etc) |
| | | **a6** | Recognize the different pathways and metabolism present in plant |

## Teaching And Assessment Methods For Achieving Learning Outcomes:

**Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:**

| Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding | | Teaching strategies/methods to be used | Methods of assessment |
|---|---|---|---|
| completing this course, students will be able to: | | | |
| a1- | Describe the characters of plant cell and | Lectures, Practical work, Tutorial | Quizzes, Written exam, homework, participation |

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different tissues and organs and list the and Micro assignment and differences between their structures. report.

**a2-** Recognize the importance of taxonomy in identification and classification of medicinal plants.

**a3-** Explain main concepts of taxonomy **a4** Describe different macroscopical and microscopical characters of different medicinal plant parts (e.g. roots, stems, leaves, flowers and fruits) with their pharmaceutical importance **a5** Draw parts of plant (leave, flower, seeds, fruits…etc)

**a6** Recognize the different pathways and metabolism present in plant

## (B) Intellectual Skills:

**Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Intellectual skills**

| Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills | | Course Intended Learning Outcomes (CILOs) of Intellectual Skills | |
|---|---|---|---|
| **After completing this program, students will be able to:** | | **After completing this course, students will be able to:** | |
| **B3-** | Design different types of safe and effective pharmaceutical dosage forms and develop novel methods of qualitative and quantitative analytical and biological analysis for pharmaceutical and biopharmaceutical products that support pharmaceutical research. | **b1-** | Distinguish different plant cell types, plant tissues and apply acquired knowledge to identify different plant tissues and organs based on anatomical characters. |
| | | **b2-** | Classify plant samples according to their morphological and anatomical characters. |
| **B4-** | Plan a modern system for administration of medical foundations and merge the ethics to business during the drug marketing | **b3-** | Identify different cells and its function. |
| | | **b4** | Assess the relevance and importance of plant morphology characters to plant identification |

## Teaching And Assessment Methods For Achieving Learning Outcomes:

**Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:**

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| Course Intended Learning Outcomes (CILOs) in Intellectual Skills. | | Teaching strategies/methods to be used | Methods of assessment |
|---|---|---|---|
| After completing this course, students will be able to: | | Lectures, Discussions, Solving Problem methods | Quizzes, Written exam, homework, participation and report |
| b1- | Distinguish different plant cell types, plant tissues and apply acquired knowledge to identify different plant tissues and organs based on anatomical characters. | | |
| b2- | Classify plant samples according to their morphological and anatomical characters. | | |
| b3- | Identify different cells and its function. | | |
| b4 | Assess the relevance and importance of plant morphology characters to plant identification | | |

## (C) Professional and Practical Skills:

**Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills**

| Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills | | Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills | |
|---|---|---|---|
| After completing this program, students will be able to: | | After completing this course, students will be able to: | |
| C2- | Handle and dispose chemicals and pharmaceutical preparations safely and effectively. | c1- | Handle and dispose chemicals safely |
| | | c2- | Manipulate pharmaceutical instruments and equipment safely and efficiently (microscopes, pipettes, slides and cover slips, ……etc.) |
| | | c3 | Integrate different morphological and anatomical aspects to conclude a scientific classification of plants |

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| | | | |
|---|---|---|---|
| **C3-** | Extract, isolate, purify, identify and formulate the natural products and assure their rational use. | **c4** | Apply acquired information to describe morphological characters of real life samples. |

**Teaching And Assessment Methods For Achieving Learning Outcomes:**

**Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:**

| **Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills** | | **Teaching strategies/methods to be used** | **Methods of assessment** |
|---|---|---|---|
| **After completing this course, students will be able to:** | | Lectures ,Laboratory work, independent study and Group assignments. | Practical works, practical reports and presentations based on their experimental work. |
| **c1-** | Handle and dispose chemicals safely | | |
| **c2-** | Manipulate pharmaceutical instruments and equipment safely and efficiently (microscopes, pipettes, slides and cover slips, ……etc.) | | |
| **c3** | Integrate different morphological and anatomical aspects to conclude a scientific classification of plants | | |
| **c4** | Apply acquired information to describe morphological characters of real life samples. | | |

## (D) General / Transferable Skills:

**Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: General and Transferable skills**

| **Program Intended Learning Outcomes (PILOs) in General / Transferable skills** | | **Course Intended Learning Outcomes (CILOs) in General / Transferable skills** | |
|---|---|---|---|
| **After completing this program, students will be able to:** | | **After completing this course, students will be able to:** | |
| **D1-** | Practice independent learning needed for continuous professional development | **d1-** | Apply information technology skills to prepare complete and clear scientific report. |
| **D3** | Develop financial, market management, writing, presentation and time management skills as well as creativity, critical thinking, problem solving and decision making abilities. | **d2** | Work effectively as a part of a team and independently to perform the required tasks. |
| | | **d3** | Develop information technology (IT) skills |

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| | | | |
|---|---|---|---|
| | | **d4** | Acquire effective time-management skills |

## Teaching And Assessment Methods For Achieving Learning Outcomes:

**Alignment of Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:**

| Course Intended Learning Outcomes (CILOs) in General and Transferable Skills | | Teaching strategies/methods to be used | Methods of assessment |
|---|---|---|---|
| **After completing this course, students will be able to:** | | Lectures, small group discussions, practical classes and micro assignments | Reports, presentations and communication with the lecturer and his colleagues. |
| **d1-** | Apply information technology skills to prepare complete and clear scientific report. | | |
| **d2** | Work effectively as a part of a team and independently to perform the required tasks. | | |
| **d3** | Develop information technology (IT) skills | | |
| **d4** | Acquire effective time-management skills | | |

## III. Course Content:

### 1 – Course Topics/Items:

**a – Theoretical Aspect**

| Order | Topic List / Units | CILOs (symbols) | Sub-topic List | Number of weeks | Contact hours |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
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| | | | | | |
|---|---|---|---|---|---|
| 1 | Introduction | a1, d1-4 | Introduction to botany Classification of the Plant Kingdom | 1 | 2 |
| 2 | Plant Morphology | a1,a5, a6, b2, b4, c3, c4, d1-4 | - Seed and seed germination.<br>- Full morphological description of roots, stems and leaves; and their modifications. | 3 | 6 |
| 3 | Histology | a1, a2, a4, a5, a6, b2, b3, d1-4 | - Cell and other cell content<br>- Tissue system<br>- Anatomy of root in di and monocotyledons<br>- Anatomy of stem in di and monocotyledons<br>- Anatomy of leaves in di and monocotyledons | 3 | 6 |
| 4 | Midterm exam | a1-2, a4-6 | | 1 | 2 |
| 5 | Plant Physiology | a1,a4, d1-4 | - Enzymes, "Plant pigments and photosynthesis.<br>-Respiration, metabolism of carbohydrates, fats and nitrogen (different metabolic pathways).<br>-Secondary metabolites. | 4 | 8 |
| 6 | Taxonomy of the flowering plants | a1, a3, b1, d1-4 | - Principles of Plant systematic and Nomenclature.<br>- Flower, inflorescence, fruits and study the characteristic features of | 3 | 6 |

| | | | | | |
|---|---|---|---|---|---|
| | | | some important families of monocot- and dicotyledonous plants. -Demonstration of some representatives with special reference to their pharmaceutical importance. | | |
| 7 | Final exam | a1-6 | | 1 | 2 |
| **Number of Weeks /and Units Per Semester** | | | | **16** | **32** |

## b- Practical Aspect:

| Order | Training Tasks | CILOs (symbols) | Number of weeks | Contact hours |
|---|---|---|---|---|
| 1 | Morphology<br>-Diversity of plant life -Parts of flowing plants:<br>seed -<br>Stem<br>Leaves-Flowers<br>-Fruits<br>-Root and Rhizomes | c1-4 | 3 | 6 |
| 2 | Histology<br>-Cell and other cell content<br>- Tissue system<br>- Anatomy of root in di and monocotyledons<br>- Anatomy of stem in di and monocotyledons<br>- Anatomy of leaves in di and monocotyledons | c1-4 | 3 | 6 |

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| | | | | |
|---|---|---|---|---|
| 3 | Midterm exam | c1-4 | 1 | 2 |
| 4 | Physiology of plants -<br>Nutrition | c1-4 | 2 | |
| | -Respiration<br>- Photosynthesis<br>- Transpiration<br>-Metabolism | | | 4 |
| 5 | Taxonomy<br>- Division and general description<br>- Virus<br>- Bacteria<br>- Fungi<br>- Algae<br>- Bryophyte<br>- Betrediophytes<br>- Gymnosperms<br>- Angiosperms<br>- Selected families of dicotyledons<br>- Selected families of monocotyledons | c1-4 | 4 | 8 |
| 6 | Revision | c1-4 | 2 | 4 |
| 7 | Final exam | c1-4 | 1 | 2 |
| **Number of Weeks /and Units Pr Semester** | | | **16** | **32** |

## IV. Teaching strategies of the course:

Lectures, Practice session, Small group discussions, Tutorials and Practical classes

## -Assessment Methods:

Written and Oral exams, Quizzes, homework, participation, Reports , and Practical examination, practical reports, Practical works and presentations

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## V. Schedule of Assessment Tasks for Students During the Semester:

| No. | Assessment Method | Week Due | Mark | Proportion of Final Assessment | Aligned Course Learning Outcomes (CILOs symbols) |
|---|---|---|---|---|---|
| 1 | **Attendance ,Participation and quizzes, Oral Tests and Homeworkassignments** | **1-16** | **20** | 13% | a2,a5,b1,b2 |
| 2 | **Attendance, Practical Reports and Practical mid-semester exam** | 7-16 | 30 | 20% | c1-4 |
| 3 | **Theoretical Mid-semester exam** | **8** | 30 | 20% | a1-6, b1-4 |
| 5 | **Final Exam (practical)** | **16** | 20 | 13% | c1-4 |
| 6 | **Final Exam (Theoretical)** | **16** | 50 | 33% | a1-6, b1-4 |
| | **Total** | | **150** | **100%** | |

## VI. Students' Support:

| Office Hours/week | Other Procedures (if any) |
|---|---|
| Two contact hours per week | None |

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## VII. Learning Resource (MLA style or APA style)S:

**1- Required Textbook(s) ( maximum two )**

- **Heber Wilkinson Youngken. 2010. Pharmaceutical Botany:** A Text-Book for Students of Pharmacy and Science. Creative Media Partners, LLC.
- James D. Mauseth. 2012. Botany: An introduction to plant biology. 5th ed. Jones & Bartlett Publishers ; USA press.

**2- Recommended Readings and Reference Materials**

1- Janice Glimn-Lacy, Peter B. Kaufman. 2006. Botany Illustrated: Introduction to Plants, Major Groups Flowering Plant Families. 2nd ed. Springer ; USA 2- Lectures Notes and Practical Manual.

**3- Essential References**

**4- Electronic Materials and Web Sites *etc*.**

1. http/www.Phytomania.org.
2. http/www.medicalbotanyintroduction.html.
3. http/www.botanical.com
4. http://www.pubmed.com

Planta Medica, Journal of natural products

**5- Other Learning Material:**

-

## VIII. Facilities Required:

| | |
|---|---|
| **1 - Accommodation:** | - Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc.<br>- Well-equipped laboratories with all required equipment and reagents. |
| **2 - Computing resources:** | - Computer laboratory with internet facilities. |

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## IX. Course Improvement Processes:

### 1- Strategies for obtaining student feedback on effectiveness of teaching

- Student-based assessment of the effectiveness of teaching using a questionnaire designed by the Quality Assurance Unit at the end of the semester.
- Meeting with students and faculty (once per semester).

### 2- Other strategies for evaluation of teaching by the instructor or by the department.

- Assessment of the course syllabus and contents by the teachers using a questionnaire designed by the Quality Assurance Unit of the university at the end of the semester.
- Regular meeting and discussion of the course content between the Head of Department and the teaching staff of the course (for theory and practice).

### 3- Processes for improvement of teaching.

- Revision of the course specification and its teaching strategies every three academic years after consideration of all issues raised by the teachers and/or students during regular meetings and discussions.
- Exploring any possible defects in the course that might be encountered by the teaching staff and their mitigation in subsequent improved versions of course specification.

### 4- Processes for verifying standards of students' achievement

- Checking of a sample of students' work by an independent faculty member.
- Periodic exchange and check marking of a sample of students' assignments with a faculty member from another institution.
- Adoption of scoring rubrics to assess the students' achievement (both for ongoing or summative assessments).
- Regular follow-up of laboratory logbooks to assess the practical achievement of students.

### 5- Procedures for periodically reviewing of course effectiveness and planning for improvement

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| | |
|---|---|
| | ▪ Student rating and feedback<br>▪ Peer rating and feedback<br>▪ Regular meeting of the Curriculum Committee of the faculty. |
| **6- Course development plans** | |
| | ▪ Conducting regular workshops for the staff for improving their course specification skills. ▪ Regular revision of course specification and syllabus items. |

| | |
|---|---|
| **VIII. Course Policies: (including plagiarism, academic honesty, attendance etc)** | |
| **The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------** | |
| **1** | **Class Attendance:**<br>▪ Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam. |
| **2** | **Tardy:**<br>- Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three |
| | weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent. |
| **3** | **Exam Attendance/Punctuality:**<br>▪ Exam attendance is obligatory unless being excused by the department and faculty.<br>▪ Absence from assignments or exams will be dealt with according to the general policy of the university. |
| **4** | **Assignments & Projects:**<br>▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable. |
| **5** | **Cheating:**<br>▪ Punishment of cheating will be according to the general policy of the university in this respect. |

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| | |
|---|---|
| 6 | **Plagiarism:**<br>▪ Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university. |
| 7 | **Other policies:**<br>▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit. |

# Course Plan of Medicinal Botany

| I. - Information about Faculty Member Responsible for the Course: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Name of Faculty Member | Bushra Moharam | Office Hours | | | | | |
| Location & Telephone No. | 730010755 | SAT | SUN | MON | TUE | WED | THU |
| E-mail | bushramoharam@yahoo.com | 1 | | 1 | | | |

| II. Course Identification and General Information: | | | |
|---|---|---|---|
| 1- | Course Title: | Medicinal Botany | |
| 2- | Course Number & Code: | Ph331 | |
| 3- | Credit hours: | C.H | Total |

| | | Th. | Seminar | Pr. | F. Tr. | |
|---|---|---|---|---|---|---|
| | | 2 | - | 2 | | 3 |
| 4- | **Study level/year at which this course is offered:** | 2nd level /1st semester | | | | |
| 5- | **Pre –requisite (if any):** | None | | | | |
| 6- | **Co –requisite (if any):** | None | | | | |
| 7- | **Program (s) in which the course is offered** | Bachelor of Pharmacy | | | | |
| 8- | **Language of teaching the course:** | English | | | | |
| 9- | **System of Study:** | Semesters | | | | |
| 10- | **Mode of delivery:** | Regular | | | | |
| 11- | **Location of teaching the course:** | Faculty of Pharmacy- Sana`a university | | | | |

## III. Course Description:

It is an introduction to the scientific study of plant life. This course is to evaluate and understand plant physiology processes, forms, reproduction, morphology and anatomy and how higher plants named and classified. Students will have a basic information in Botany (e.g. Systematic Botany; Plant Morphology and Anatomy and Plant Physiology) with special attention to the pharmaceutical importance of various organisms belonging to plant kingdom. This course will enable students to learn about the biology of medicinal plants, and gain insight as to what makes them useful in treating diseases.

## IV. Intended learning outcomes (ILOs) of the course:

**After completing this course, students will be able to:**

1. Describe the characters of plant cell and different tissues and organs and list the differences between their structures.
2. Explain terminology, nomenclature and classification system in general botany.
3. Explain main concepts of taxonomy
4. Describe different macroscopical and microscopical characters of different medicinal plant parts (e.g. roots, stems, leaves, flowers and fruits) with their pharmaceutical importance
5. Draw parts of plant (leave, flower, seeds, fruits…etc)
6. Recognize the different pathways and metabolism present in plant
7. Distinguish different plant cell types, plant tissues and apply acquired knowledge to identify different plant tissues and organs based on anatomical characters.
8. Classify plant samples according to their morphological and anatomical characters.
9. Identify different cells and its function.
10. Assess the relevance and importance of plant morphology characters to plant identification
11. Handle and dispose chemicals safely
12. Manipulate pharmaceutical instruments and equipment safely and efficiently (microscopes, pipettes, slides and cover slips, ……etc.)
13. Integrate different morphological and anatomical aspects to conclude a scientific classification of plants
14. Apply acquired information to describe morphological characters of real life samples.
15. Apply information technology skills to prepare complete and clear scientific report.
16. Work effectively as a part of a team and independently to perform the required tasks.
17. Develop information technology (IT) skills
18. Acquire effective time-management skills

## I. Course Content:

### 1 – Course Topics/Items:

**a – Theoretical Aspect**

| Order | Topic List / Units | CILOs (symbols) | Sub-topic List | Week Due | Contact hours |
|---|---|---|---|---|---|
| 1 | Introduction | a1, d1-4 | Introduction to botany<br>Classification of the Plant Kingdom | 1 | 2 |
| 2 | Plant Morphology | a1,a5, a6, b2, b4, c3, c4, d1-4 | - Seed and seed germination.<br>- Full morphological description of roots, stems and leaves; and their modifications. | 2-4 | 6 |
| 3 | Histology | a1, a2, a4, a5, a6, b2, b3, d1-4 | - Cell and other cell content<br>- Tissue system<br>- Anatomy of root in di and monocotyledons<br>- Anatomy of stem in di and monocotyledons<br>- Anatomy of leaves in di and monocotyledons | 5-7 | 6 |
| 4 | Midterm exam | a1-2, a4-6 | | 8 | 2 |
| 5 | Plant Physiology | a1,a4, d1-4 | - Enzymes, "Plant pigments and photosynthesis.<br>-Respiration, metabolism of carbohydrates, fats and nitrogen (different metabolic pathways).<br>-Secondary metabolites. | 9-12 | 8 |

| | | | | | |
|---|---|---|---|---|---|
| 6 | Taxonomy of the flowering plants | a1, a3, b1, d1-4 | - Principles of Plant systematic and Nomenclature.<br>- Flower, inflorescence, fruits and study the characteristic features of | 13-15 | 6 |
| | | | some important families of monocot- and dicotyledonous plants.<br>-Demonstration of some representatives with special reference to their pharmaceutical importance. | | |
| 7 | Final exam | a1-6 | | 16 | 2 |
| **Number of Weeks /and Units Per Semester** | | | | **16** | **32** |

## b- Practical Aspect:

| Order | Training Tasks | CILOs (symbols) | Week Due | Contact hours |
|---|---|---|---|---|
| 1 | Morphology<br>-Diversity of plant life -Parts of flowing plants:<br>seed -<br>Stem<br>Leaves-Flowers<br>-Fruits<br>-Root and Rhizomes | c1-4 | 1-3 | 6 |

| | | | | |
|---|---|---|---|---|
| 2 | Histology<br>-Cell and other cell content<br>- Tissue system<br>- Anatomy of root in di and monocotyledons<br>- Anatomy of stem in di and monocotyledons<br>- Anatomy of leaves in di and monocotyledons | c1-4 | 4-6 | 6 |
| 3 | Midterm exam | c1-4 | 7 | 2 |
| 4 | Physiology of plants -<br>Nutrition | c1-4 | 8,9 | |
| | -Respiration<br>- Photosynthesis<br>- Transpiration<br>-Metabolism | | | 4 |
| 5 | Taxonomy<br>- Division and general description<br>- Virus<br>- Bacteria<br>- Fungi<br>- Algae<br>- Bryophyte<br>- Betrediophytes<br>- Gymnosperms<br>- Angiosperms<br>- Selected families of dicotyledons<br>- Selected families of monocotyledons | c1-4 | 10-13 | 8 |
| 6 | Revision | c1-4 | 14,15 | 4 |
| 7 | Final exam | c1-4 | 16 | 2 |
| **Number of Weeks /and Units Pr Semester** | | | **16** | **32** |

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|---|---|---|---|---|---|
| ا.م.د.بشرى محرم | ا.د. محمود البريهي | د.سلوى راوح | د.خالد الشوبة | ا.م.د. هدى العماد | ا.د. القاسم محمد عباس |

## V. Teaching strategies of the course:

Lectures, Practice session, Small group discussions, Tutorials and Practical classes

## VI. Assessment Methods:

Written and Oral exams, Quizzes, homework, participation, Reports , and Practical examination, practical reports, Practical works and presentations

| No. | Type of Assessment Tasks | Week Due | Mark | Proportion of Final Assessment |
|---|---|---|---|---|
| 1 | **Attendance ,Participation and quizzes, Oral Tests and** | **1-16** | **20** | 13% |
| | **Homework-assignments** | | | |
| 2 | **Attendance, Practical Reports and Practical mid-semester exam** | 7-16 | 30 | 20% |
| 3 | **Theoretical Mid-semester exam** | **8** | 30 | 20% |
| 5 | **Final Exam (practical)** | **16** | 20 | 13% |
| 6 | **Final Exam (Theoretical)** | **16** | 50 | 33% |
| | **Total** | | **150** | **100%** |

## VII. Learning Resources:

**1- Required Textbook(s) ( maximum two ).**

| | |
|---|---|
| | **Heber Wilkinson Youngken. 2010. Pharmaceutical Botany:** A Text-Book for Students of Pharmacy and Science. Creative Media Partners, LLC.<br>James D. Mauseth. 2012. Botany: An introduction to plant biology. 5th ed. Jones & Bartlett Publishers ; USA press. |
| **2- Essential References.** | |
| | |
| **3- Electronic Materials and Web Sites *etc.*** | |
| | 1. http/www.Phytomania.org.<br>2. http/www.medicalbotanyintroduction.html.<br>3. http/www.botanical.com<br>4. http://www.pubmed.com<br>Planta Medica, Journal of natural products |


## IX. Course Policies:

**The University Regulations on academic misconduct will be strictly enforced. Please refer to ----------**

| | |
|---|---|
| 1 | **Class Attendance:**<br>▪ Attendance of all lectures and practical sessions is required. Unexcused absence exceeding 25% of the lectures or practical sessions will disqualify the student from entering the final exam. |
| 2 | **Tardy:**<br>- Roll will be called in the very beginning of each lecture and practical class. Retardation for more than three weeks without a reasonable excursion, the student involved shall not be allowed to attend the class any longer and consequently shall be considered to be absent. |
| 3 | **Exam Attendance/Punctuality:**<br>▪ Exam attendance is obligatory unless being excused by the department and faculty.<br>▪ Absence from assignments or exams will be dealt with according to the general policy of the university. |

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| | |
|---|---|
| **4** | **Assignments & Projects:**<br>▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator. ▪ Projects: Not applicable. |
| **5** | **Cheating:**<br>▪ Punishment of cheating will be according to the general policy of the university in this respect. |
| **6** | **Plagiarism:**<br>▪ Plagiarism in written essays, reports, etc. is not accepted, and students who plagiarize the works of others will be punished according to the general policy of the university. |
| **7** | **Other policies:**<br>▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit. |