|  |  |
| --- | --- |
| **Course Title:** | **Recent approaches in plant analysis** |
| **Course Code:** | **PHGN 524** |
| **Program:** | **Pharmaceutical sciences** |
| **Department:** | **Pharmacognosy** |
| **College:** | **Pharmacy** |
| **Institution:** | **Najran University** |

Table of Contents

[A. Course Identification 3](#_Toc951372)

[6. Mode of Instruction (mark all that apply) 3](#_Toc951373)

[B. Course Objectives and Learning Outcomes 4](#_Toc951374)

[1. Course Description 4](#_Toc951375)

[2. Course Main Objective 4](#_Toc951376)

[3. Course Learning Outcomes 4](#_Toc951377)

[C. Course Content 4](#_Toc951378)

[D. Teaching and Assessment 5](#_Toc951379)

[1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods 5](#_Toc951380)

[2. Assessment Tasks for Students 6](#_Toc951381)

[E. Student Academic Counseling and Support 6](#_Toc951382)

[F. Learning Resources and Facilities 6](#_Toc951383)

[1.Learning Resources 6](#_Toc951384)

[2. Facilities Required 6](#_Toc951385)

[G. Course Quality Evaluation 7](#_Toc951386)

[H. Specification Approval Data 7](#_Toc951387)

# A. Course Identification

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Credit hours:** | | | | **2** | | | | | | | | | | | | |
| **2. Course type** | | | | | | | | | | | | | | | | |
| **a.** | University | | **√** | | College | | | **√** | Department | | | | **√** | Others |  |  |
| **b.** | | Required | | | | **√** | Elective | | |  |  | | | | | |
| **3. Level/year at which this course is offered:** | | | | | | | | | | | | **Level 9** | | | | |
| **4. Pre-requisites for this course** (if any)**:**  PHGN 423 | | | | | | | | | | | | | | | | |
| **5. Co-requisites for this course** (if any)**:** | | | | | | | | | | | | | | | | |
| ------------- | | | | | | | | | | | | | | | | |

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

| **No** | **Mode of Instruction** | **Contact Hours** | **Percentage** |
| --- | --- | --- | --- |
| **1** | **Traditional classroom** | 30 | 100 % |
| **2** | **Blended** |  |  |
| **3** | **E-learning** |  |  |
| **4** | **Correspondence** |  |  |
| **5** | **Other** |  |  |

**7. Actual Learning Hours** (based on academic semester)

|  |  |  |
| --- | --- | --- |
| **No** | **Activity** | **Learning Hours** |
| **Contact Hours** | | |
| **1** | **Lecture** | 35 |
| **2** | **Laboratory/Studio** |  |
| **3** | **Tutorial** |  |
| **4** | **Others** (specify) |  |
|  | **Total** | 35 |
| **Other Learning Hours\*** | | |
| **1** | **Study** | 50 |
| **2** | **Assignments** | 10 |
| **3** | **Library** | 0 |
| **4** | **Projects/Research Essays/Theses** | 0 |
| **5** | **Others** (specify) | 0 |
|  | **Total** | 95 |

**\*** The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

# 

# B. Course Objectives and Learning Outcomes

|  |
| --- |
| Course Description Recent approaches in plant analysis (PHGN 524) course provide the students a Knowledge about plant constituents 1ry and 2ry metabolites origin, structures, extraction, isolation and uses. In addition, their identification, separation and analysis with various chromatographic techniques. |
|  |
| Course Main Objectives  1. Acquire the knowledge about the different plant constituents. 2. Understand the different classes of plant constituents, their identification, extraction, isolation, analysis and uses. |
|  |

## 

## 3. Course Learning Outcomes

| **CLOs** | | **Aligned****PLOs** |
| --- | --- | --- |
| 1 | **Knowledge:** |  |
| 1.1 | - Identify the classes of plant constituents and their properties. | K2 |
| 1.2 | - Describe the structures of different classes of plant metabolites. | K2 |
| **2** | **Skills:** |  |
| 2.1 | - Differentiate between different plant constituents and their isolation and purification. | S1 |
| 2.2 | - Determine the methods of extraction and identification of plant metabolites. | S2 |
| **3** | **Competence:** |  |
| 3.1 | - Suggest the proper method for identification of the different plant constituents | C1 |

# C. Course Content

|  |  |
| --- | --- |
| **List ofTopic** | **Contact**  **hours** |
| - General introduction to phytochemistry.  - General procedure for extraction and purification.  - Chromatography (Introduction, classification, and terminology and mode of  chromatographic separation). | 2 |
| - Adsorption chromatography.  - Column chromatography. | 2 |
| - Thin layer chromatography and Paper chromatography  - Concepts of gas chromatography. | 1 |
| - Alkaloids (introduction). | 2 |
| - Amino- alkaloid and tropolone alkaloids.  - Pyrridine and piperidine alkaloids. | 2 |
| - Tropane alkaloids. | 2 |
| - Opium and quinolone alkaloids. | 2 |
| - Isoquinoline, indole and imidazole alkaloids. | 2 |
| - Purine bases, terpenodal and steroidal alkaloids. | 1 |
| - Glycosides (definition, structure, classification and hydrolysis).  - Extraction, isolation and evaluation of glycosides. | 2 |
| Cardio-active glycosides.  - Flavonoid glycosides.  - Saponin glycosides. | 2 |
| - Antharquinone glycosides.  - Miscellaneous glycosides  - Bitter principles | 2 |
| - Cynogenetic glycosides, Thioglycosides.  - Coumarin and coumarin glycosides.  - Terpene compounds | 1 |
| Tannins. | 1 |
| Volatile oils   * Introduction * Methods of extraction of V.O * Structures of V.O * Classess of V.O | 4 |
| Total | 30 |

# D. Teaching and Assessment

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

| **Code** | **Course Learning Outcomes** | **Teaching Strategies** | **Assessment Methods** |
| --- | --- | --- | --- |
| **1.0** | **Knowledge** | | |
| 1.1 | - Identify the classes of plant constituents and their properties. | Lectures | Written Exams and assignments |
| 1.2 | - Describe the structures of different classes of plant metabolites. | Lectures | Written Exams and assignments |
| **2.0** | **Skills** | | |
| 2.1 | - Differentiate between different plant constituents and their isolation and purification. | Lectures | Written Exams |
| 2.2 | - Determine the methods of extraction and identification of plant metabolites. | Lectures | Practical exams |
| **3.0** | **Competence** | | |
| 3.1 | - Suggest the proper method for identification of the different plant constituents | Lecture | Exams and assignments |

## 2. Assessment Tasks for Students

| **#** | **Assessment task\*** | **Week Due** | **Percentage of Total Assessment Score** |
| --- | --- | --- | --- |
| **1** | 1st mid-term exams | 6-7 | **20**% |
| **3** | Assignment | 12 | **10%** |
| **6** | 2nd Mid term exam | 10 | **20**% |
| **9** | Final theoretical exam | 17 | **50%** |
| **10** | Total |  | **100%** |

**\*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 :**   * Office hours (**2** hours per week + appointments). * Office hours must be announced on the office door and blackboard * Student counselling: as required per week. |
|  |

# F. Learning Resources and Facilities

## 1.Learning Resources

|  |  |
| --- | --- |
| **Required Textbooks** | i- Trease and Evans, Pharmacognosy, T.E, Walis, Pharmacognosy  Ashtosh Kar, Pharmcognosy and Pharmacobiotechnology,  ii- The Hand Books of Natural Flavonoids; Harborne, J., B. and Baxter, H,;  John Wiley &Sons Ltd.(1999).  iii- Natural Products Isolation; Canell, R. J. P, Humana Press.  (1998).  iv- Chromatographic Analysis of pharmaceuticals; Adamovics |
| **Essential References Materials** | 1-Trease and Evans, pharmacognosy, 15t" Ed., Saunders  Company, Nottingham,U.K., Willium Charles Evans.(2003).  2- Handout from power point presentation |
| **Electronic Materials** | **www.dlaf.nu.edu.sa** |
| **Other Learning Materials** | **MS office word and powerpoint** |

## 2. Facilities Required

| **Item** | **Resources** |
| --- | --- |
| **Accommodation**  (Classrooms, laboratories, demonstration rooms/labs, etc.) | * A Suitable lecture room equipped with data show and internet and 25 seats. |
| **Technology Resources**  (AV, data show, Smart Board, software, etc.) | * Computer * Internet access * Effective e-learning system and virtual classe |
| **Other Resources**  (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 | * Head of dept. and students | * Direct (Group discussions with the college teaching lecturers) |
| * Effectiveness of student assessment | * Faculty members and students | * Indirect (questionnaire) |
| * Extent of achievement of course learning outcomes | * Student * Peer review | * Direct * Indirect |
| * Quality of learning resources | * Students | * Indirect (questionnaire) |

**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

|  |  |
| --- | --- |
| **Council / Committee** | **Pharmacognosy dep. council** |
| **Reference No.** | **Council No. 1** |
| **Date** | **25/08/2019** |