



Course Specification of Pharmacognosy – I

I. Course Identification and General Information:						
1	Course Title:	Pharmacognosy – I				
2	Course Number & Code:	Ph352				
3	Credit hours:	C.H				Total
		Theoretical	Practical	Training	Seminar	
		2	2			3
4	Study level/ semester at which this course is offered:	3 rd level /1 st semester				
5	Pre –requisite (if any):	Pharmaceutical Organic Chemistry and Medicinal Botany				
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				
	The department in which the course is offered:	Department of Pharmacognosy				
9	Location of teaching the course:	Faculty of Pharmacy				
10	Prepared by:	Dr. Bushra Moharam				
11	Date of approval:					

Course description:

This course involves of basic principles of pharmacognosy, including introduction and definitions, scope of pharmacognosy, historical review of medicinal plants and natural products. It is concerned with medicinal plants classification, geographical distribution, cultivation, collection and preparation, drying, processing and storage, standardization, adulteration of crude drugs. The course includes identification of major active constituents and use of medicinal plants.



Also it includes the macro- and micro-morphological characteristics of different plant organs (morphological and histological examination, and chemical identification, leaves, flowers, seeds, barks and woods).

- at the end of this course, the students should have the knowledge and skills related to drugs of plant sources from different organs including leaves, barks, root and rhizomes and herbs, which are known to be used in traditional medicine and have curative values.

III. Intended Learning Outcomes (ILOs) of the Course:

At the end of this course, the students will be able to:

1. know the modern concept and scope of Pharmacognosy
2. Enumerate the factors affecting cultivation of medicinal plants
3. Recognize botanical aspects, nomenclature, and classification of crude drugs
4. Recognize the morphology and anatomy of different plant organs
5. Identify the active constituents using chemical tests
6. Differentiate the different types of plant tissues.
7. Determine microscopical methods and knowledge for qualitative evaluation of natural drugs.
8. Investigate the morphology and anatomy of different plant organs.
9. Analyse herbal drugs to identify the adulteration of herbal drugs.
10. Identify different classes of natural compounds chemically
11. Handle and dispose chemicals and broken glasses safely and effectively
12. Work effectively in team and independently to perform the required tasks
13. Demonstrate written and oral communication skills
14. Use technology in collecting data and information
15. Acquire effective time-management skills.

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, clinical, social, behavioral, health and pharmaceutical sciences.	a1-	know the modern concept and scope of Pharmacognosy
A4-	Recognize the pharmaceutical dosage form design and the quality control of pharmaceutical formulations according to GMP and pharmacopeial requirements to support the pharmaceutical industries and research.	a2-	Enumerate the factors affecting cultivation of medicinal plants
		a3-	Recognize botanical aspects, nomenclature, and classification of crude drugs
		a4-	Recognize the morphology and anatomy of different plant organs

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-	Lectures, group discussion	Written exam, homework, Quizzes, and participation.
a2-		
a3-		
a4-		

(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-	Identify the active constituents using chemical tests
		b2-	Differentiate the different types of plant tissues.



B4-	Plan a modern system for administration of medical foundations and merge the ethics to business during the drug marketing.	b3-	Determine microscopical methods and knowledge for qualitative evaluation of natural drugs.
		b4-	Investigate the morphology and anatomy of different plant organs.

Teaching And Assessment Methods For Achieving Learning Outcomes:

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

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	Oral presentation, Written and Practical examination for assessment
b1-	Identify the active constituents using chemical tests		
b2-	Differentiate the different types of plant tissues.		
b3-	Determine microscopical methods and knowledge for qualitative evaluation of natural drugs.		
b4-	Investigate the morphology and anatomy of different plant organs.		

(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-	Analyse herbal drugs to identify the adulteration of herbal drugs.
		c2-	Identify different classes of natural compounds chemically
C3-	Extract, isolate, purify, identify and formulate the natural products and assure their rational use.	c3-	Handle and dispose chemicals and broken glasses safely and effectively

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,	practical reports, Practical works and presentations based on their experimental work.
c1-	Analyse herbal drugs to identify the adulteration of herbal drugs.		
c2-	Identify different classes of natural compounds chemically		
c3-	Handle and dispose chemicals and broken glasses safely and effectively		

(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-	Work effectively in team and independently to perform the required tasks
D3	Develop financial, market management, writing, presentation and time management skills as well as creativity, critical thinking, problem solving and decision making abilities.	d2-	Demonstrate written and oral communication skills.
		d3-	Use technology in collecting data and information
		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, practical classes. Discussions in groups	Reports, presentations and communication with the lecturer and his colleagues.
d1-	Work effectively in team and independently to perform the required tasks		
d2-	Demonstrate written and oral communication skills.		



d3-	Use technology in collecting data and information		
d4-	Acquire effective time-management skills.		

Course Content:					
1 – Course Topics/Items:					
a – Theoretical Aspect					
Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction to Pharmacognosy	a1-3,d2-3	History of pharmacognosy, Scope of pharmacognosy and modern aspects. Classification of crude drugs.	2	4
2	Drugs Preparation:	a3,b3,c1-3,d1-3	cultivation of medicinal plants, factors affecting plant growth and production of drug, Adultration of drugs, Chemistry of the active constituent	2	4
3	Leaves	a2,a4, b1-4 , c2-3, d2-3	Introduction, Morphology and anatomy, active constituents, chemical test, uses of Digitalis, Senna, belladonna, stramonium, hyoscyamus, jaborandi and boldo, tea, Bucho, Coca leaves	2	4
4	Midterm exam	a1-4, b1-2		1	2
5	Barks	a2,a4, b1-4, c2-3,	Introduction, Morphology and anatomy, active	3	6



		d2-3	constituents, chemical test, uses of Cinnamon, Cassia, Cinchona, Frangula, cascara quillaia, Pomegranate, Hamamelis and galls barks		
6	Root and rhizomes;	a2,a4, b1-4, c2-3, d2-3	Introduction, Morphology and anatomy, active constituents, chemical test, uses of aconite, jalap, liquorice, ipecacuanha, rhubarb, rauwolfia, ginger, ginseng, curcuma, podophyllum,	2	4
7	Herbs	a2,a4, b1-4, c2-3, d2-3	History, collection, characters, constituent, uses of Ergot, Indian hemp, Catharanthus, Lobelia, peppermint, thyme herps	2	4
8	Revision	a2,a4, b1-4, c2-3, d2-3		1	2
9	Final exam	a1-4, b1-2		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	Introduction, Laboratory safety measures - The use of light microscope.	c1,d1,d2,d4	1	2
2	Morphology - microscopical identification of henna, datura, Digitalis, senna, leaves	a2,a4,b1-4, c1-3,d1-4	3	6



3	Morphology - microscopical identification of bark; Cinchona, Cinnamon, pomegranate	a2,a4,b1-4, c1-3,d1-4	3	6
4	Midterm exam	c1-3	1	2
5	Morphology - microscopical identification of liquorice, rhubarb, ginger, turmeric	a2,a4,b1-4, c1-3,d1-4	3	6
6	Morphology - microscopical examination of medicinal herbs; mentha, thyme, cannabis, hyoscyamus,	a2,a4,b1-4, c1-3,d1-4	3	6
7	Revision	a2,a4,b1-4, c1-3,d1-4	1	2
8	Final exam	c1-3	1	2
Number of Weeks /and Units Per Semester			16	32

a- Teaching Strategies of the Course:

- Lectures, Practice session, solving problem, Small group discussions, Tutorials and Practical classes

b-Assessment Methods:

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

. 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	1-16	20	13%	a1,a4,b3-4
2	Attendance, Practical Reports and Practical mid-semester exam	8-16	30	20%	c1,c2,c3
3	Theoretical Mid-semester exam	8	30	20%	a1-4, b1, b2
5	Final Exam (practical)	16	20	13%	c1-3
6	Final Exam (Theoretical)	16	50	33%	a1-4, b1, b2
Total			150	100%	



Students' Support:	
Office Hours/week	Other Procedures (if any)
Two contact hours per week	None

Learning Resources (MLA style or APA style):	
1- Required Textbook(s) (maximum two)	
	1- Jarald E.E. and Jarald S. E., (2009); "Textbook of Pharmacognosy and Phytochemistry" CBS Publishers & Distributors, New Delhi 2- Evans W.C., Evans D. & Trease E., Saunders "Trease and Evans(2009); 'Pharmacognosy" 16th ed. Elsevier, New York
2- Recommended Readings and Reference Materials	
	1- Steven M. Colegate and Russell J. Molyneux. (2008); "Bioactive Natural Products : Detection, Isolation, and Structural Determination" 2nd ed., 2- Cordell G.A. (2002); "The Alkaloids: Chemistry and Biology" Volume 59, Elsevier, New York 3- 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
5- Other Learning Material:	
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Facilities Required:	
1 - Accommodation:	- Well-equipped lecture halls with data show facilities, whiteboards, net connection, etc. - Well-equipped laboratories with all required equipment and reagents.
2 - Computing resources:	- Computer laboratory with internet facilities.



Course Improvement Processes:	
1- Strategies for obtaining student feedback on effectiveness of teaching	
	<ul style="list-style-type: none"> ▪ 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.	
	<ul style="list-style-type: none"> ▪ 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.	
	<ul style="list-style-type: none"> ▪ 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	
	<ul style="list-style-type: none"> ▪ 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	
	<ul style="list-style-type: none"> ▪ Student rating and feedback ▪ Peer rating and feedback ▪ Regular meeting of the Curriculum Committee of the faculty.
6- Course Development Plans	
	<ul style="list-style-type: none"> ▪ Conducting regular workshops for the staff for improving their course specification skills.



	▪ Regular revision of course specification and syllabus items.
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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: <ul style="list-style-type: none">▪ 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: <p>- 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.</p>
3	Exam Attendance/Punctuality: <ul style="list-style-type: none">▪ Exam attendance is obligatory unless being excused by the department and faculty.▪ Absence from assignments or exams will be dealt with according to the general policy of the university.
4	Assignments & Projects: <ul style="list-style-type: none">▪ Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator.▪ Projects: Not applicable.
5	Cheating: <ul style="list-style-type: none">▪ Punishment of cheating will be according to the general policy of the university in this respect.
6	Plagiarism: <ul style="list-style-type: none">▪ 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: <ul style="list-style-type: none">▪ General policies of the Students' Affairs of the University and the Quality Assurance Unit.



Course Plan of Pharmacognosy – I

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:	Pharmacognosy I				
2-	Course Number & Code:	Ph352				
3-	Credit hours:	C.H			Total	
		Th.	Seminar	Pr.		F. Tr.
		2	-	2		3
4-	Study level/year at which this course is offered:	3 rd Level / 1 st Semester				
5-	Pre –requisite (if any):	Medicinal Botany				
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:

This course **involves basic** principles of pharmacognosy, including introduction and definitions, scope of pharmacognosy, historical review of medicinal plants and natural products. It is concerned with medicinal plants classification, geographical distribution, cultivation, collection and preparation, drying, processing and storage, standardization, **and** adulteration of crude drugs. It includes identification of major active constituents and use of medicinal plants.

It also includes the macro- and micro-morphological characteristics of different plant organs (morphological and histological examination, and chemical identification, leaves, flowers, seeds, barks and woods).

- **At** the end of this course, the students should have the knowledge and skills related to drugs of plant sources from different organs including leaves, barks, root and rhizomes and herbs, which are known to be used in traditional medicine and have curative values.

IV. Intended Learning Outcomes (ILOs) of the Course:



After completing this course, students will be able to:

1. know the modern concept and scope of Pharmacognosy
2. Enumerate the factors affecting cultivation of medicinal plants
3. Recognize botanical aspects, nomenclature, and classification of crude drugs
4. Recognize the morphology and anatomy of different plant organs
5. Identify the active constituents using chemical tests
6. Differentiate the different types of plant tissues.
7. Determine microscopical methods and knowledge for qualitative evaluation of natural drugs.
8. Investigate the morphology and anatomy of different plant organs.
9. Analyse herbal drugs to identify the adulteration of herbal drugs.
10. Identify different classes of natural compounds chemically
11. Handle and dispose chemicals and broken glasses safely and effectively
12. Work effectively in team and independently to perform the required tasks
13. Demonstrate written and oral communication skills
14. Use technology in collecting data and information
15. Acquire effective time-management skills.

Course Content:

1 – Course Topics/Items:

a – Theoretical Aspect

Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Week Due	Contact hours
1	Introduction to Pharmacognosy	a1-3,d2-3	History of pharmacognosy, Scope of pharmacognosy and modern aspects.	1,2	4



			Classification of crude drugs.		
2	Drugs Preparation:	a3,b3,c1-3,d1-3	cultivation of medicinal plants, factors affecting plant growth and production of drug, Adultration of drugs, Chemistry of the active constituent	3,4	4
3	Leaves	a2,a4, b1-4, c2-3, d2-3	Introduction, Morphology and anatomy, active constituents, chemical test, uses of Digitalis, Senna, belladonna, stramonium, hyoscyamus, jaborandi and boldo, tea, Bucho, Coca leaves	5,6	4
4	Midterm Exam	a1-4, b1-2		7	2
5	Barks	a2,a4, b1-4, c2-3, d2-3	Introduction, Morphology and anatomy, active constituents, chemical test, uses of Cinnamon, cassia, Cinchona, Frangula, cascara quillaia, Pomegranate, Hamamelis and galls barks	8-10	6
6	Root and Rhizomes;	a2,a4, b1-4, c2-3, d2-3	Introduction, Morphology and anatomy, active constituents, chemical test, uses of aconite, jalap, liquorice, ipecacuanha, rhubarb, rauwolfia, ginger,	11,12	4



			ginseng, curcuma, podophylum,		
7	Herbs	a2,a4, b1-4, c2-3, d2-3	History, collection, characters, constituent, uses of Ergot, Indian hemp, Catharanthus, Lobelia, peppermint, thyme herps	13,14	4
8	Revision	a2,a4, b1-4 , c2-3, d2-3		15	2
9	Final exam	a1-4, b1-2		16	2
Number of Weeks /and Units Per Semester				16	32

b- Practical Aspect:				
Order	Training Tasks	CILOs (symbols)	Week Due	Contact hours
1	Introduction, Laboratory safety measures - The use of light microscope.	c1,d1,d2,d4	1	2
2	Morphology - microscopical identification of henna, datura, Digitalis, senna, leaves	a2,a4,b1-4, c1-3,d1-4	2-4	6
3	Morphology - microscopical identification of bark; Cinchona, Cinnamon, pomegranate	a2,a4,b1-4, c1-3,d1-4	5-7	6
4	Midterm exam	c1-3	8	2
5	Morphology - microscopical identification of liquorice, rhubarb, ginger, turmeric	a2,a4,b1-4, c1-3,d1-4	9-11	6
6	Morphology - microscopical examination of medicinal herbs; mentha, thyme, cannabis, hyoscyamus,	a2,a4,b1-4, c1-3,d1-4	12-14	6
7	Revision	a2,a4,b1-4, c1-3,d1-4	15	2
8	Final exam	c1-3	16	2
Number of Weeks /and Units Per Semester			16	32



V. Teaching strategies of the course:

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

VI. Assessment Methods:

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance ,Participation and quizzes	All	20	13%
2	Attendance, Practical Reports and Practical mid-semester exam	All	30	20%
3	Theoretical Mid-semester exam	8 th	30	20%
4	Final Exam (practical)	16 th	20	13%
5	Final Exam (Theoretical)	16 th	50	33%
Total			150	100%

VII. Learning Resources:

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

- 1- Jarald E.E. and Jarald S. E., (2009); "Textbook of Pharmacognosy and Phytochemistry" CBS Publishers & Distributors, New Delhi
- 2- Evans W.C., Evans D. & Trease E., Saunders "Trease and Evans(2009); 'Pharmacognosy" 16th Elsevier, New York

2- Essential References.

3- Electronic Materials and Web Sites etc.

1. <http://www.Phytomania.org>.
2. <http://www.medicalbotanyintroduction.html>.
3. <http://www.botanical.com>



VIII. Course Policies:	
1	Class Attendance: <ul style="list-style-type: none">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: <p>- 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.</p>
3	Exam Attendance/Punctuality: <ul style="list-style-type: none">Exam attendance is obligatory unless being excused by the department and faculty.Absence from assignments or exams will be dealt with according to the general policy of the university.
4	Assignments & Projects: <ul style="list-style-type: none">Assignments: Written and oral; Laboratory logbook signed by the responsible demonstrator.Projects: Not applicable.
5	Cheating: <ul style="list-style-type: none">Punishment of cheating will be according to the general policy of the university in this respect
6	Plagiarism: <ul style="list-style-type: none">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: <p>General policies of the Students' Affairs of the University and the Quality Assurance Unit.</p>

Republic of Yemen
Ministry of Higher
Education and Scientific
Research
Sana'a University
Faculty of Pharmacy
Quality Assurance Unit



الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة - صنعاء
كلية الصيدلة
وحدة ضمان الجودة

رئيس الجامعة
ا.د. القاسم محمد عباس

مركز التطوير الأكاديمي وضمان الجودة
ا.د. هدى العماد

عميد الكلية
ا.د. خالد الشويه

وحدة ضمان الجودة
ا.د. محمود البريهي