

## **Peer Revision**

<b>Reviewers</b>	<b>University</b>	<b>Date of Revision</b>
- Prof. Dawlat Salem	Cairo	10/12/2011
- Prof. Ahmad K. Mansur	Mansura	28/11/2011

# Program Specification of Master Degree in Pediatrics

Sohag University

Faculty of Medicine

## Program Specification

### A. Basic Information

1. Program Title: Master degree in Pediatrics
2. Program Type: Single
3. Faculty: Faculty of Medicine
4. Department: Pediatrics
5. Coordinator: Dr. Mostafa Abo Sedara
6. Assistant coordinator: Ahmed Mohamed Monir
7. External Evaluator: Prof. Asmaa Hammed Shourete (professor of pediatrics, Assiut University)
8. Last date of program specifications approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018.

### B. Professional Information

#### 1. Program Aims:

The aim of this program is to provide the postgraduate with the Pediatric knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics through providing:

1. Scientific knowledge essential for the practice of pediatrics according to the international standards.
2. Skills necessary for proper diagnosis and management of patients, including diagnostic, problem solving and decision making skills.
3. Provision of sound ethical principles related to medical practice.
4. Active participation in community needs assessment and problems solving.
5. Maintenance of learning abilities necessary for continuous medical education.
6. Developing research interest and abilities.

#### 2. Attributes of the post graduate:

1. Mastering the basics of scientific research methodologies.
2. The application of the analytical method and used in the field of Pediatrics.
3. The application of specialized knowledge and integrate it with the relevant knowledge in practice.
4. Be aware of the problems and has modern visions in the field of Pediatrics.
5. Identify problems in the field of Pediatrics and find solutions to them.



# Program Specification of Master Degree in Pediatrics

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Faculty of Medicine

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#### 2. Attributes of the post graduate:

1. Mastering the basics of scientific research methodologies.
2. The application of the analytical method and used in the field of Pediatrics.
3. The application of specialized knowledge and integrate it with the relevant knowledge in practice.
4. Be aware of the problems and has modern visions in the field of Pediatrics.
5. Identify problems in the field of Pediatrics and find solutions to them.
6. Mastery of professional skills in this specialty and use of the appropriate recent technologies supporting these skills.

7. Communicate effectively and the ability to lead work teams.
8. Decision-making in his professional contexts.
9. To employ and preserve the available resources to achieve the highest benefit.
10. Awareness of his role in the community development and preservation of the environment at the lights of both international and regional variables.
11. Reflects the commitment to act with integrity and credibility, responsibility and commitment to rules of the profession.
12. Academic and professional self development and be capable of continuous learning.

### **3. Program Intended Learning Outcomes (ILOs)**

#### **a) Knowledge and Understanding:**

By the end of the program, the student is expected to be able to :

- a1. Describe the basic embryology of body systems related to pediatric specialty.
- a2. Illustrate the important biochemical metabolic pathways of normal child .
- a3. List indications, pharmacokinetics and side effects of commonly used drugs in the field of pediatrics.
- a4. Describe the basic pathology of common pediatric diseases .
- a5. Describe the common diagnostic and laboratory techniques necessary to establish diagnosis of common pediatric diseases.
- a6. Describe the basic physiology of body systems related to pediatric specialty .
- a7. Describe the basic microbiology and immunology related to pediatric diseases
- a8. List principles of medical biostatistics and clinical epidemiology .
- a9. Mention common pediatric diseases and their causations .
- a10. Describe methods of diagnosis of pediatric diseases and their complications .
- a11. List principles of the management of pediatric diseases.
- a12. List methods of prevention of pediatric diseases.
- a13. Mention principles of the care of term and preterm newborn babies
- a14. Mention methods of evaluating normal and abnormal patterns of growth and development of infants and children .
- a15. Mention genetic diseases and ways of their diagnosis and the concepts of genetic counseling.
- a16. Describe the nutritional requirements of infants and children and nutritional abnormalities .
- a17. Mention scientific development in the field of pediatrics .
- a18. Mention The mutual influence between professional practice and its impacts on the environment .
- a19. Mention Ethical and legal principles of professional practice in the field of pediatrics.
- a20. List The principles and fundamentals of quality of professional practice in the field of pediatrics.
- a21. List The basics and ethics of scientific research.

#### **b) Intellectual Skills**

By the end of the program, the student is expected to be able to:

- b1. Interpret data acquired through history taking to reach a provisional diagnosis for pediatric problems .
- b2. Select from different diagnostic alternatives the ones that help reaching a final diagnosis for pediatric problems.
- b3. Link between knowledge for professional problem solving .
- b4. Conduct research studies and / or write a scientific study on a research problem.
- b5. Assess Risk in professional practices in the field of pediatrics.
- b6. Plan to develop performance in the field of pediatrics.
- b7. Identify different pediatric problems and find solutions for them.
- b8. Analyze researches related to pediatrics.

**c) Professional and Practical Skills**

By the end of the program the student is expected to be able to:

- c1. Master the basic and modern professional skills in the area of pediatrics.
- c2. Write and evaluate of medical reports.
- c3. Assess methods and tools existing in the area of pediatrics.

**d) General and Transferable Skills**

By the end of the program, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication.
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice.
- d3. Assess himself and identify his personal learning needs.
- d4. Use different sources for information and knowledge.
- d5. Teach others and evaluate their performance.
- d6. Work coherently and successfully as a part of a team and as a team leader.
- d7. Manage time efficiently.
- d8. Maintain Continuous self-learning.

**4. Academic Standards :**

Sohag faculty of medicine adopted the general National Academic Reference Standards (NARS) provided by the national authority for quality assurance and accreditation of education (naqaae) for postgraduate programs . This was approved by the faculty council decree No.6854, in its session No. 177, dated 18/5/2009. Based on these NARS; Academic Reference Standards (ARS) were suggested for this program. These ARS were revised by external evaluator, and approved by the faculty council decree No. 7528, in its session No.191, dated 15/3/2010. The adoption of NARS and the suggested ARS were approved by University council degree No 587, in its session No.60. dated 26-12-2011.

**5. Curriculum Structure and Contents**

- 5.a- Program duration : 6 semesters ( 3 years )
- 5.b- Program structure

Course title	Number of hours / week		
	Lectures	Practica l	Clinical
<u>First part :</u>			
Medical Physiology	2	----	----
Clinical Pharmacology	1	----	----
Medical Biochemistry	1	----	----
Pathology	1	1	1
Clinical and Chemical Pathology	1	2	----
Medical Microbiology and Immunology	1	1	1
Embryology	2	----	----
Medical biostatistics & Epidemiology	1	1	1
<u>Second part :</u>			
Pediatrics	16.6	8	8
Genetics & growth and development	2	1	1
Neonatology & Nutrition	2	1	1

code	Item	No	%	
b.i	Total credit hours	Compulsory	٥٠	١٠٠
		Elective	٠	٠
		Optional	٠	٠
b.iii	credit hours of basic sciences courses	١٥	٣٠	
b.iv	credit hours of courses of social sciences and humanities	٠	٠	
b.v	credit hours of specialized courses:	٢٤	٤٨	
b.vi	credit hours of other course	--	--	
b.vii	Practical/Field Training	٥	١٠	
b.viii	Program Levels (in credit-hours system):			
	Level 1: 1 <sup>st</sup> part	١٥	٣٠	
	Level 2: 2 <sup>nd</sup> Part	٢٤	٤٨	
	Level 3: Thesis	٦	١٢	

6. **Program courses** \* 11 courses are compulsory

**Level of Program**

**Semester...1.....**

**First part :****A. Compulsory:**

Course title	Total number of hours	Number of hours / week			Program ILOs covered (by No)
		Lecture	Practical	Clinical	
Medical Physiology	1	2	----	----	a6,b3,b7,c3,d1,d2,d3,d4,d6,d7,d8
Clinical Pharmacology	1	1	----	----	a3,b3,b7,c1,d1,d2,d3,d4,d7,d8
Medical Biochemistry	1	1	----	----	a2,b1,b2,b3,b7,c1,d1,d2,d3,d4,d7,d8
Pathology	3	1	1	1	a4,b1,b3,b7,c2,c3,d1,d2,d3,d4,d6,d7,d8
Clinical and Chemical Pathology	3	1	2	----	a5,b1,b2,b3,b7,c2,d1,d2,d3,d4,d6,d7,d8
Medical Microbiology and Immunology	3	1	1	1	a7,b1,b2,b3,b7,c2,c3,d1,d2,d3,d4,d6,d7,d8
Embryology	1	2	----	----	a1,b3,b7,c1,d1,d2,d3,d4,d7,d8
Medical biostatistics & research methodology	2	1	1	1	a8,b1,b4,b5,b7,c1,c3,d1,d2,d3,d4,d6,d7,d8

**B- Elective – number required:**

No elective course in the pediatric Master course program

**C- Optional – number required:**

No optional course in the pediatric Master course program

**Second part****A. Compulsory:**

Course title	Total number of hours	Number of hours / week			Program ILOs covered (by No)
		Lecture	Practical	Clinical	
Pediatrics	19	11		8	a9,a10,a11,a12, a17,a18,a19,a20, a21, b1,b2,b3,b4,b5, b6,b7,b8,c1,c2,c3,d1,d2,d3,d4,d5, d6,d7,d8
Genetics & growth and development	3	2		1	a14,a15,b1,b2,b3,b4,b5, b6,b7,b8,c1,c2,c3,d1,d2,d3,d4,d5, d6,d7,d8
Neonatology &	3	2		1	a13,a16, b1,b2,b3,b4,b5, b6,b7,b8,c1,c2,c3,d1,d2,d3,d4,d5,

Nutrition					d6,d7,d8
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**B- Elective – number required:**

No elective course in the pediatric Master course program

**C- Optional – number required:**

No optional course in the pediatric Master course program

**7. Program Admission Requirements**

**I- General Requirements.**

1. Candidate should have either:
  - i. MBBCh degree from any Egyptian Faculty of Medicine or
  - ii. Equivalent Degree from Medical Schools abroad approved by the ministry of high Education.
2. Candidate should pass the house office training year.
3. Those who are not university hospital residents should pass a training for at least 12 months in one of the known hospitals.
4. Follow postgraduate bylaw Regulatory rules of Sohag Faculty of Medicine approved by the ministerial decree No. (44), dated 6/1/2010.

**II- Specific Requirements:**

1. Candidates graduated from Egyptian Universities should have at least “Good Rank” in their final year/cumulative years examination, and grade “Good Rank” in Pediatrics Course too.
2. Candidate should know how to speak & write English well.
3. Candidate should have computer skills.

**8. Regulations for Progression and Program Completion**

Duration of program is 50 credit hours ( $\geq 4$  semesters  $\geq 3$  years), starting from registration till 2<sup>nd</sup> part exam; divided to:

**First Part: (15 Credit hours  $\geq 6$  months  $\geq 1$  semester):**

- Program-related basic & clinical sciences & research Methodology, Ethics & medical reports, Biostatistics and computer.
- At least six months after registration should pass before the student can ask for examination in the 1<sup>st</sup> part.
- Two sets of exams: 1st in October — 2nd in April.
- At least 50% of the written exam is needed to pass in each course.
- For the student to pass the first part exam, a score of at least 60% (Level D) in each course is needed.
- Those who fail in one course need to re-exam it only for the next time only, and if re-fail, should register for the course from the start.

**Thesis/Essay(6 Credit hours  $\geq 6$  months=1 semester):**

- Completion of the 1<sup>st</sup> part credit hours and passing the exams are pre requisites for documentation of the **Thesis/Essay** subject.



- Should be completed, defended and accepted after passing the 1<sup>st</sup> part examination, and at least one month before allowing to enter 2<sup>nd</sup> part final examination.
- Accepting the thesis is enough to pass this part.

**Second Part: (24 Credit hours  $\geq$  18 months= 3 semesters):**

1. Program related specialized sciences of pediatric Courses.

- Completion of the 1<sup>st</sup> part credit hours and passing the exams are pre requisites for documentation of the 2<sup>nd</sup> part courses.
- After passing at least:
  - Practical training: 36 months residency in the department of pediatrics
  - Residents in other places: Completed 36 months residency; 12 months of them training in the department of Obstetrics & Gynecology.
- The students should pass the 1<sup>st</sup> part before asking for examination in the 2<sup>nd</sup> part.
- Fulfillment of the requirements in each course as described in the template and registered in the log book (5 Credit hours; with obtaining  $\geq$ 75% of its mark ) is a prerequisite for candidates to be assessed and undertake part 1 and part 2 examinations; the credit hours of the logbook are calculated as following:
  - Each Cr. Hr.= 60 working Hrs.
  - Logbook= 5 Cr. Hr. X 60 working Hrs = 300 Working Hrs.
  - Collection of working Hrs. is as following:

Activity		Hrs
Grand rounds	اجتماع علمي موسع	٦
Training courses	دورات تدريبية	12/ day
Conference attendance	حضور مؤتمرات علمية داخلي خارجة	١٢/day 18/day
Thesis discussion	حضور مناقشات رسائل	٦
Workshops	حضور ورش عمل	١٢/day
Journal club	ندوة الدوريات الحديثة	٦
Seminars	لقاء علمي موسع	٦
Morbidity and Mortality conference	ندوة تحليل المخاطر المرضية أو الوفاة	٦
Self education program	برنامج التعليم الذاتي	٦

- Two sets of exams: 1st in October - 2nd in April.
- At least 50% of the written exam is needed to pass in each course.
- For the student to pass the 2<sup>nd</sup> part exam, a score of at least 60% (Level D) in each course is needed.

**9. Methods of student assessments:**

Method of assessment	weight	The assessed ILOs
1-Activities		- General transferable skills, intellectual skills

2-Written Exams: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	50%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills
3-OSCE/ OSPE	50%	-Practical skills, intellectual skills, general transferable skills
4-Structured Oral Exams		- Knowledge, Intellectual skills, General transferable skills

**Assessment schedule:**

**Part I:**

- Medical Physiology: Written Exam (2 hours) + Structured oral Exam
- Clinical pharmacology: Written Exam (2 hours) + Structured oral Exam
- Medical Biochemistry: Written Exam (2 hours) + Structured oral Exam
- Pathology: Written Exam (2 hours) + Structured oral Exam +OSPE
- Clinical and Chemical Pathology: Written Exam (2 hours) + Structured oral Exam +OSCE
- Microbiology: Written Exam (2 hours) + Structured oral Exam +OSCE
- Biostatistics & Computer and Research Methodology: Written Exam (2 hours) + Structured oral Exam+ OSPE
- Epidemiology Embryology: Written Exam (2 hours) + Structured oral Exam

**Part II:**

-Four Written Exam (3 hours for each) Two for Pediatrics, one for Genetics & growth and development and one for Neonatology & Nutrition + OSCE for Pediatrics + Structured oral Exam.

**10. Evaluation of Program**

Evaluator	Tool	Sample
1- Senior students	Questionnaire	25
2- Alumni	Questionnaire	15
3- Stakeholders ( Employers )	Questionnaire	60
4-External Evaluator(s) (External Examiner(s))	Report	1
5- Other		

# Course Specifications of Medical Physiology for Master degree in Paediatrics

Sohag University

Faculty of Medicine

- 1- Program Title: Master degree in Pediatrics
- 2- Minor/major element of the program: minor
- 3- Department offering the program: Pediatrics Department
- 4- Department offering the course: Medical Physiology Department
- 5- Academic year/level: First part
- 6- Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

## A. Basic Information

**Title:** Medical Physiology Department for M.D degree in paediatrics

**Code:** PHY 0526-300

**Total hours:**

Module	Lectures	Practical	Total hours	Credit
Physiology	30hours		30 hours	2

## B. Professional information

### 1. Course aims:

The aim of this course is to provide the student with the basic physiological knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

### 2. Intended learning outcomes (ILOs):

#### a) **Knowledge and understanding :**

By the end of the course the student should be able to:

a1. Describe the basic physiology of body systems related to pediatric specialty , by being able to :

- a- Mention mechanisms of fever
- b- Mention the physiology of vomiting & diarrhea.
- c- Describe normal & abnormal heart sounds.
- d- Mention Regulation of arterial blood pressure

#### b) **Intellectual Skills:**

By the end of the course the student should have the ability to:

- b1. link between knowledge for professional problem solving .
- b2. Identify pediatric problems and find solutions based on proper understanding of physiological basis .

#### c) **Professional and Practical Skills:**

By the end of the course the student should have the ability to:

- c1. Assess methods and tools existing in the area of pediatrics based on proper understanding of physiological basis.

**d) General and Transferable Skills:**

By the end of the course the student should have the ability to:

- d1. Communicate effectively by different types of effective communication.  
 d2. Use appropriate computer program packages and the internet to serve the development of professional practice.  
 d3. Assess himself and identify his personal learning needs.  
 d4. Use of different sources for information and knowledge.  
 d5. Work coherently and successfully as a part of a team and team's leadership.  
 d6. Manage time effectively.  
 d7. Maintain Continuous self-learning.

**3. Contents of the course:**

subject	Total number of hours	lectures	practical
I-Cardio-vascular system. -regulation of arterial blood pressure. -regulation of heart rate. -heart sounds.	6	6	
II-Respiration. hypoxia, cyanosis & regulation of respiration.	4	4	
III- Endocrine physiology. -thyroid, adrenal & pituitary.	6	6	
IV-Kidney. -mechanism of urine formation. -acid base balance.	2	2	
V-Blood . -types & functions of white blood cells. -R.B.Cs, erythropoiesis & anemia. -platelets, homeostasis & coagulation.	4	4	
VI-Digestion. -vomiting, deglutition, absorption & intestinal movements.	4	4	
VII-physiology of C.N.S. -pain	2	2	
VIII-metabolism. -fever & its mechanism.	2	2	
Total	30	30	
Credit	2	2	

**4. Teaching Methods:**

- 4.1. Lectures  
 4.2. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills)

## **5. Methods of Students Assessment:**

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

### **Assessment Schedule**

Assessment 2	Final written exam	Week: 24
Assessment 3	Final Structured Oral Exam	Week: 24

### **Weighting of Assessments**

Final-term written examination	00%
Structured Oral Exam	00%
Total	100%

## **6. List of references:**

### **6.1- Essential books (textbooks)**

Guyton textbook of physiology.2010

### **6.2- Recommended Books**

Ganong medical review of physiology.2009

### **6.3- Periodicals, Web Sites, ... etc**

American journal of physiology

Websites :

<http://www.ncbi.nlm.gov/>

Findarticle.com

Freemedicaljournals.com

## **7. Facilities Required for Teaching and Learning**

1- Adequate infrastructure: Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.

2- Teaching tools: Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator: Dr/Hoda Mostafa**

**Head of Department: Dr: Hoda Mostafa**

**Date: 18/12/2011, Revised:1/9/2012, Revised:1/12/2013, Revised:1/12/2018**

# Course Specifications of Clinical Pharmacology for Master degree in Paediatrics

Sohag University

Faculty of Medicine

- 1- Program Title: Master degree in Pediatrics
- 2- Minor/major element of the program: minor
- 3- Department offering the program: Pediatrics Department
- 4- Department offering the course: Clinical Pharmacology Department
- 5- Academic year/level: First part
- 6- Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

## A. Basic Information

**Title:** Clinical Pharmacology Department for M.D degree in paediatrics

**Code:** PHA 0526-300

**Total hours:**

Module	Lectures	Practical	Total hours	Credit
Clinical Pharmacology	30 hours		30 hours	2

## B. Professional information

### 1. Course aims:

The aim of this course is to provide the student with the basic pharmacological knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

### 2. Intended learning outcomes (ILOs):

#### a) **Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. List indications, pharmacokinetics and side effects of commonly used drugs in the field of pediatrics.

#### b) **Intellectual Skills**

By the end of the course, the student is expected to be able to:

- b1. link between knowledge for professional problem solving.
- b2. Identify different pediatric problem and choose the proper drugs and therapeutic measures for them.

#### c) **Professional and Practical Skills:**

By the end of the course, the student is expected to be able to:

- c1. Master the basic and modern professional pharmacological skills needed for the pediatric practice .

#### d) **General and Transferable Skills:**

By the end of the course, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication.

- d2. Use appropriate computer program packages and the internet to serve the development of professional practice
- d3. Assess himself/herself and identify his personal learning needs.
- d4. Use of different sources for information and knowledge.
- d5. Manage time effectively.
- d6. Maintain Continuous self-learning.

**3. Contents of the course:**

Subjects	No. of hours	Lecture	Tutorial/ Practical
- Basic pharmacological principles : pharmacodynamics pharmacokinetics drug interactions	2	2	
- Cardiovascular drugs: - antihypertensive drugs - heart failure drugs - antiarrhythmic drugs - diuretics	4	4	
- respiratory system drugs :	2	2	
- asthma drugs	2	2	
- antitussive drugs	2	2	
- GIT drugs	2	2	
- drug treatment of peptic ulcer	2	2	
- drug treatment of blood diseases	4	4	
- drugs acting on CNS :	4	4	
- sedative-hypnotics	4	4	
- antiepileptic drugs	2	2	
- Non-steroidal anti-inflammatory drugs	8	8	
- Endocrine drugs			
- antimicrobial drugs			
<b>Total</b>	<b>30</b>	<b>30</b>	-----

**4. Teaching Methods:**

- 4.1. Lectures
- 4.2. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills)

## 5. Methods of Students Assessment:

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

### Assessment Schedule

Assessment 2	Final written exam	Week: 24
Assessment 3	Final Structured Oral Exam	Week: 24

### Weighting of Assessments

Final-term written examination	100%
Structured Oral Exam	100%
Total	100%

## 6. List of references:

### 6.1- Essential Books (Text Books)

Goodman and Gilman (2016) Manual of Clinical Pharmacology and therapeutics.  
Mc Graw Hill, Katzung (2018),

### 6.2- Recommended Books

Clinical Pharmacology book, Assiut university.

### 6.3- Periodicals, Web Sites, etc

- 1-American Journal of Pharmacology
- 2- British journals of pharmacology.
- 3- [WWW.Google.COM](http://WWW.Google.COM)
- 4- [WWW.yahoo.com](http://WWW.yahoo.com).
- 5- [www.sciencedirect.com](http://www.sciencedirect.com).

## 7. Facilities Required for Teaching and Learning

- 1- Adequate infrastructure: Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.
- 2- Teaching tools: Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator:** Dr/Hala Ibrahim

**Head of Department:** Dr: Sanaa Abd Elaal

**Date:** 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018



## Course Specifications of Medical Biochemistry for Master degree in Paediatrics

Sohag University

Faculty of Medicine

- 1- Program Title: Master degree in Pediatrics
- 2- Minor/major element of the program: minor
- 3- Department offering the program: Pediatrics Department
- 4- Department offering the course: Medical Biochemistry Department
- 5- Academic year/level: First part
- 6- Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

### A. Basic Information

**Title: Medical Biochemistry Department for M.D degree in paediatrics**

**Code: BIO 0526-300**

**Total hours:**

Module	Lectures	Practical	Total hours	Credit
Medical biochemistry	15 hours		15 hours	1

### B. Professional information

#### 1. Course aims:

The aim of this course is to provide the student with the basic biochemistry knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

#### 2. Intended learning outcomes (ILOs):

##### a) **knowledge and understanding**

By the end of the course, the student is expected to be able to:

- a1. Illustrate the important biochemical metabolic pathways of normal child by being able to:
  1. List the biochemical importance of intermediary metabolism (Anabolic and catabolic)
  2. Discrete the importance of clinical biochemistry and its relation to pediatrics diseases.
  3. Explain the role of vitamin, minerals,
  4. Mention and explain hormonal action
  5. List the beneficial of good nutrition

##### b) **Intellectual Skills**

By the end of the course, the student is expected to be able to:

- b1. Interpret data acquired through biochemical tests to reach a provisional diagnosis for pediatric problems.

- b2. Select from different diagnostic alternatives the ones that help reaching a final diagnosis for metabolic pediatric problems.
- b3. link between knowledge for professional problem solving .
- b4. Identify different metabolic and biochemical pediatric problems and find solutions for them.

**c) Professional and Practical Skills**

By the end of the course, the student is expected to be able to:

- c1. Master the basic and modern professional skills related to the area of pediatrics.

**d) General and Transferable Skills**

By the end of the course, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication.
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice
- d3. Assess himself/herself and identify his personal learning needs.
- d4. Use of different sources for information and knowledge.
- d5. Manage time effectively.
- d6. Maintain Continuous self-learning.

**3. Contents of the course:**

<b>Topic</b>	<b>No. Of hours</b>	<b>Lecture</b>	<b>Tutorial/ Practical</b>
Carbohydrates -Hexose monophosphate pathway -Carbohydrates storage diseases Glucose intolerance, Diabetes and hypoglycemia	3	3	
Lipid -Metabolism (catabolic and anabolic pathways ) of fatty acids -Metabolism of triacylglycerol, phospholipids, glycolipids. -Cholesterol metabolism and steroid hormones. -Lipoproteins mainly LDL, and HDL.	3	3	
Protein Metabolism -General reactions -Mechanism of nitrogen disposal from amino acids -Metabolic inborn errors.	3	3	
Calcium and vitamin-D metabolism	1	1	
Iron metabolism	1	1	
Lactating mothers and general considerations of infant malnutrition	1	1	
Immunoglobulins and gene rearrangement	1	1	
Normal and abnormal hemoglobin	1	1	
Hormonal disturbances in childhood	1	1	
<b>Total</b>	<b>15</b>	<b>15</b>	
<b>Credit</b>	<b>1</b>	<b>1</b>	

#### 4. **Teaching Methods:**

4.1. Lectures

4.2. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills)

#### 5. **Methods of Students Assessment:**

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

#### **Assessment Schedule**

Assessment 2	Final written exam	Week: 24
Assessment 3	Final Structured Oral Exam	Week: 24

#### **Weighting of Assessments**

Final-term written examination	50%
Structured Oral Exam	50%
Total	100%

#### 6. **List of references:**

##### **6.1- Essential Books (Text Books)**

1. Text book of Biochemistry For Medical students 8th edition by DM Vasudevan 2016
2. Harper's illustrated Biochemistry 31 edition by victor Rodwell et al 2018

##### **6.2- Recommended Books**

1. Lectures notes on clinical Biochemistry, Whitby et al 1993
2. Lippincott's illustrated reviews Biochemistry, Champe, PC, Harvey, RA, 2007

##### **6.3- Periodicals, Web Sites, ... etc**

<http://www.ncbi.nlm.gov/>  
<http://www.vlib.org/>  
[www.genome.ad.jp/kegg/regulation.](http://www.genome.ad.jp/kegg/regulation)  
Findarticle.com  
Freemedicaljournals.com

#### 7. **Facilities Required for Teaching and Learning**

- 1- Adequate infrastructure: Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.
- 2- Teaching tools: Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator:** Dr. Amira Morad Foad

**Head of Department:** Prof Dr. Nagwa Sayed Ahmed Hassan

**Date:** 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018

# Course Specifications of Pathology for Master degree in Paediatrics

Sohag University

Faculty of Medicine

1. Program Title: Master degree in Pediatrics
2. Minor/major element of the program: Minor
3. Department offering the program: Pediatrics Department
4. Department offering the course: Pathology Department.
5. Academic year/level: First part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

## A. Basic Information

Title: Pathology, for Master degree in paediatrics

Code: Pat 0526-300

Total hours:

Module	Lectures	Practical	Tutorial/ clinical	Total hours
pathology	15 hours	30 hours	-----	45 hours

## B. Professional Information

### 1. Course aims:

The aim of this course is to provide the student with the basic pathological knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

### 2. Intended Learning Outcomes of Course (ILOs):

#### a) **Knowledge and Understanding:**

By the end of the course the student should be able to:

- a1. Describe the basic pathology of common pediatric diseases , by being able to :
- a2. Mention basis of general and systemic pathology.
- a3. List etiology, pathogenesis and pathologic manifestation of diseases.
- a4. Correlate gross and histopathology with the clinical basis of diseases.
- a5. Mention the fate and complications and prognosis of different diseases.

#### b) **Intellectual Skills:**

By the end of the course the student should have the ability to:

- b1. Interpret data acquired through pathological examination reports to reach a diagnosis for pediatric problems.
- b2. Link between knowledge for professional problem solving .
- b3. Identify pediatric problems and find solutions based on proper understanding of pathological basis.

#### c) **Professional and Practical Skills:**

By the end of the course the student should have the ability to:

- c1. Understands and evaluate pathological reports.
- c2. Assesses pathological methods and tools related to the field of pediatrics.

**d) General and Transferable Skills:**

By the end of the course the student should have the ability to:

- d1. Communicate effectively by different types of effective communication .
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice.
- d3. Assess himself and identify his personal learning needs.
- d4. Use of different sources for information and knowledge.
- d5. Work coherently and successfully as a part of a team and team's leadership.
- d6. Manage time effectively .
- d7. Maintain Continuous self-learning.

**3. Course Contents:**

Topic	No. of hours	Lecture	Practical
<u>1- General Pathology:</u>	9	3	6
1.1. Inflammation	1.5	0.5	1
1.2. Cell injury & apoptosis	1.5	0.5	1
1.3. Repair & healing	1.5	0.5	1
1.4. Circulatory disturbances	1.5	0.5	1
1.5. Immunopathology	1.5	0.5	1
1.6. Infectious diseases	1.5	0.5	1
<u>2- Pathology of Heart:</u>	6	2	4
2.1. Congenital heart diseases	1.25	0.25	1
2.2. Endocarditis & rheumatic fever	1.25	0.25	1
2.3. Valvular heart diseases	1	0.25	0.5
2.4. Myocarditis & cardiomyopathy	1	0.25	0.5
2.5. Heart failure	1	0.5	0.5
2.6. Pericarditis & pericardial effusion	1	0.5	0.5
<u>3- Pathology of Respiratory system:</u>	6	2	4
3.1. Bronchitis & bronchial asthma	1.25	0.25	1
3.2. Bronchiectasis & lung abscess	1.25	0.25	1
3.3. Pneumonias & empyema	1	0.25	0.5
a. Atelectasis & lung collapse	1	0.25	0.5
3.5. Pneumothorax & pleural effusion	1	0.5	0.5
3.6. Pulmonary hypertension	1	0.5	0.5
<u>4- Pathology of Gastrointestinal tract:</u>	6	2	4
4.1. Gastroenteritis & dysentery	1.25	0.25	1
4.2. Malabsorption syndrome	1.25	0.25	1
4.3. Intestinal obstruction	1.5	0.5	1
4.4. Hepatitis	1	0.5	0.5
4.5. Jaundice & cholestasis	1	0.5	0.5
<u>5- Pathology of Kidney:</u>	6	2	4
5.1. Glomerulonephritis	1.25	0.25	1
5.2. Nephrotic syndrome	1.25	0.25	1
5.3. Pyelonephritis	1.5	0.5	1
5.4. Hydronephrosis	1	0.5	0.5
5.5. Renal failure	1	0.5	0.5
<u>6- Pathology of Endocrine system:</u>	3	1	2
6.1. Hyperthyroidism & hypothyroidism	0.75	0.25	0.5

6.2. Grave's disease & goiter	0.75	0.25	0.5
6.3. Adrenocortical hyperfunction	0.75	0.25	0.5
6.4. Adrenal insufficiency	0.75	0.25	0.5
<u>7- Pathology of Nervous system:</u>	3	1	2
a. <u>Hydrocephalus &amp; aneurysms</u>	1.25	0.25	1
b. <u>Meningitis &amp; encephalitis</u>	0.75	0.25	0.5
c. <u>Brain abscess</u>	1	0.5	0.5
<u>8- Diseases of blood, lymph nodes, and spleen:</u>	3	1	2
8.1. <u>Leukemia &amp; lymphoma</u>	1.5	0.5	1
8.2. <u>Hypersplenism &amp; splenomegally</u>	1.5	0.5	1
<u>9- Pathology of Bone:</u>	3	1	2
9.1. <u>Osteomyelitis</u>	1.5	0.5	1
9.2. <u>Arthritis</u>	1.5	0.5	1
<b>Total</b>	<b>45</b>	<b>15</b>	<b>30</b>
<b>Credit</b>	<b>2</b>	<b>1</b>	<b>1</b>

#### 4. Teaching methods:

- 4.1. Lectures
- 4.2. Practical lessons
- 4.3. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills).

#### 5. Methods of Students Assessment:

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

#### Assessment Schedule

Assessment of the candidate is at the end of the course (1st part exam)

Assessment 1	Final written exam (1 paper)	week 24
Assessment 2	Final Structured Oral Exam	week 24

#### Weighting of Assessments

Final-term written examination	00%
Structured Oral Exam	00%
Total	100%

Formative assessment only: simple research assignment, log book, attendance

## **6. List of References**

### **6.1- Essential Books (Text Books):**

- Muir's text book of pathology, 15<sup>th</sup> edition, 2014
- Robbins pathologic basis of diseases, 10<sup>th</sup> edition, 2017

### **6.2- Recommended Books:**

- Rosi & Ackerman text book of pathology, 11<sup>th</sup> edition, 2017
- Sternberg text book of pathology, 6<sup>th</sup> edition, 2015

### **6.3- Periodicals, websites:**

American journal of pathology

Pathology journal

Human pathology journal

Web Sites: <http://www.ncbi.nlm.nih.gov/pubmed/>

## **7. Facilities Required for Teaching and Learning**

**1- Adequate infrastructure:** Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.

**2- Teaching tools:** Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator:** DR: Fatma El Zaharaa

**Head of Department:** DR: Afaf Al- Nashar

**Date:** 18/12/2011, **Revised:** 1/9/2012, **Revised:** 1/12/2013, **Revised:** 1/12/2018



## Course Specifications of Clinical and Chemical Pathology for Master degree in Paediatrics

**Sohag University**

**Faculty of Medicine**

1. Program Title: Master degree in Pediatrics
2. Minor/major element of the program: Minor
3. Department offering the program: Pediatrics Department
4. Department offering the course: Clinical and Chemical Pathology department
5. Academic year/level: First part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

### **A. Basic Information**

Title: Clinical and Chemical Pathology, for Master degree in paediatrics

Code: CLP 0526-300

Total hours:

Module	Lectures	Practical	Tutorial/clinical	Total hours
Clinical and Chemical Pathology	15 hours	30 hours		45 hour

### **B. Professional Information**

#### **1. Course aims:**

The aim of this course is to provide the student with the basic clinical pathology knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

#### **2. Intended Learning Outcomes of Course (ILOs):**

##### **a) Knowledge and Understanding:**

By the end of the course, the student is expected to be able to:

- a1. Describe the common diagnostic and laboratory techniques necessary to establish diagnosis of common pediatric diseases.

##### **b) Intellectual Skills**

By the end of the course, the student is expected to be able to:

- b1. Interpret data acquired through laboratory tests to reach a provisional diagnosis for pediatric problems .
- b2. Select from different diagnostic laboratory tests the ones that help reaching a final diagnosis for pediatric problems.
- b3. Link between knowledge for professional problem solving .
- b4. Identify different pediatric problems and find solutions for them based on proper understanding and evaluation of laboratory tests results.

##### **c) Professional and Practical Skills**

By the end of the course, the student is expected to be able to:

- c1. Understand and evaluate laboratory tests reports.

##### **d) General and Transferable Skills**

By the end of the course, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication .
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice
- d3. Assess himself and identify his personal learning needs.
- d4. Use of different sources for information and knowledge.
- d5. Manage time effectively.
- d6. Maintain Continuous self-learning.

**3. Course Contents:**

Topic	No. Of hours	Lecture	Tutorial/ Practical
Introduction to diagnostic testing	4	2	2
Blood studies : Hematology and coagulation	6	2	4
Urine studies	6	2	4
Stool studies	6	2	4
Cerebrospinal fluid studies	6	2	4
Clinical chemistry studies	6	2	4
Microbiological studies	6	2	4
Immunodiagnostic studies	5	1	4
<b>Total</b>	<b>45</b>	<b>15</b>	<b>30</b>
<b>Credit</b>	<b>2</b>	<b>1</b>	<b>1</b>

**4. Teaching methods:**

- 4.1. Lectures
- 4.2. Practical lessons
- 4.3. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills).

**5. Methods of Students Assessment:**

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

## Assessment Schedule

Assessment of the candidate is at the end of the course (1st part exam)

Assessment 1	Final written exam (1 paper)	week 24
Assessment 2	Final Structured Oral Exam	week 24

## Weighting of Assessments

Final-term written examination	50%
Structured Oral Exam	50%
Total	100%

Formative assessment only: simple research assignment, log book, attendance

## 6. List of References

### 6.1- Essential Books (Text Books)

Manual of laboratory and diagnostic tests , 2002

### 6.2- Recommended Books

Essential hematology, 2006

Tids, Clinical chemistry 2006

### 6.3- Periodicals, Web Sites,

American Journal of hematology

Journal of clinical chemistry

Websites :

<http://www.ncbi.nlm.gov/>

[www.Findarticle.com](http://www.Findarticle.com)

[www.Freemedicaljournals.com](http://www.Freemedicaljournals.com)

## 7. Facilities Required for Teaching and Learning

**1- Adequate infrastructure:** Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.

**2- Teaching tools:** Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator:** Dr. Laila Mohamed Youssef

**Head of Department:** Dr. Hasnaa A. Abo Elwafa

**Date:** 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018

# Course Specifications of Microbiology & Immunology for Master degree in Paediatrics

Sohag University

Faculty of Medicine

1. Program Title: Master degree in Pediatrics
2. Minor/major element of the program: Minor
3. Department offering the program: Pediatrics Department
4. Department offering the course: Medical Microbiology and Immunology department
5. Academic year/level: First part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

## A. Basic Information

Title: Medical Microbiology and Immunology, for Master degree in paediatrics

Code: MIC 0526-300

Total hours:

Module	Lectures	Practical	Tutorial/clinical	Total hours
Microbiology & immunology	15 hours	30 hours		45 hours

## B. Professional Information

### 1. Course aims:

The aim of this course is to provide the student with the basic microbiological and immunological knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

### 2. Intended Learning Outcomes of Course (ILOs):

#### a) Knowledge and Understanding:

By the end of the course the student should be able to:

- a1. Describe the basic microbiology and immunology related to pediatric diseases

by being able to :

- List the microorganisms affecting children all over the world and particularly in Egypt.
- Describe the metabolism and genetics of organisms.
- Describe the pathology, clinical symptoms and complications of each disease.
- Summarize the laboratory tests needed for diagnosis of each case.
- Name the drugs and instructions used for treatment of each case.
- Describe some infection control methods
- Describe the structure and function of immune system

#### b) Intellectual Skills:

By the end of the course the student should be able to:

- b1. Interpret data acquired through microbiological tests to reach a provisional diagnosis for pediatric problems.
- b2. Select from different diagnostic microbiological tests the ones that help reaching a final diagnosis for pediatric problems.
- b3. Link between knowledge for professional problem solving .
- b4. Identify pediatric problems and find solutions based on proper understanding of pathological basis.
- b5. Identify different pediatric problems and find solutions for them based on proper understanding of microbiological and immunological basis .

**c) Professional and Practical Skills:**

By the end of the course the student should have the ability to:

- c1. Understand and evaluate medical microbiological reports.
- c2. Assess methods and tools existing in the area of pediatrics based on proper understanding of microbiological and immunological basis.

**d) General and Transferable Skills:**

By the end of the course the student should have the ability to:

- d1. Communicate effectively by different types of effective communication.
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice.
- d3. Assess himself and identify his personal learning needs.
- d4. Use of different sources for information and knowledge.
- d5. Work coherently and successfully as a part of a team and team's leadership.
- d6. Manage time effectively.
- d7. Maintain Continuous self-learning.

**3. Course Contents:**

Subject	Total number of hours	lectures	Practical
- General bacteriology	3	1	2
- Systematic bacteriology	15	5	10
- General virology	3	1	2
- Systematic virology	6	2	4
Mycology-	3	1	2
- Immunology	9	3	6
- Applied microbiology	6	2	4
=====	=====	=====	=====
Total	45	15	30
Credit	2	1	1

**4. Teaching methods:**

- 4.1. Lectures
- 4.2. Practical lessons

4.3. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills).

### **5. Methods of Students Assessment:**

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

### **Assessment Schedule**

Assessment of the candidate is at the end of the course (1st part exam)

Assessment 1	Final written exam (1 paper)	week 24
Assessment 2	Final Structured Oral Exam	week 24

### **Weighting of Assessments**

Final-term written examination	50%
Structured Oral Exam	50%
Total	100%

Formative assessment only: simple research assignment, log book, attendance

### **6. List of References**

#### **6.1- Essential Books (Text Books)**

Jawetz Medical Microbiology.2010

Roitt Essential Immunology.2011

Abbas Clinical Immunology.2006

Alberts Molecular Biology.2002

#### **6.2- Recommended Books**

Topley and Wilson, colour atlas of Microbiology.2007

#### **6.3- Periodicals, Web Sites, ... etc**

Journal of Microbiology

Journal of Immunology

<http://mic.sgmjournals.org>

### **7. Facilities Required for Teaching and Learning**

**1- Adequate infrastructure:** Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.

**2- Teaching tools:** Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator:** Dr. Ekram Abd El-Rahman

**Head of Department:** Dr. Abeer Shenief

**Date:** 18/12/2011, **Revised:**1/9/2012, **Revised:**1/12/2013, **Revised:**1/12/2018

## Course Specifications of Embryology for Master degree in Paediatrics

Sohag University

Faculty of Medicine

1. Program Title: Master degree in Pediatrics
2. Minor/major element of the program: minor
3. Department offering the program: Pediatric department
4. Department offering the course: Human Anatomy & Embryology department
5. Academic year/level: First part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

### A. Basic Information

**Title: Embryology for Master degree in Paediatrics**

Code: ANA 0526-300

**Total hours:**

Module	Lectures	Practical	Total hours	Credit
embryology	30 hours	--	30 hours	2

### B. Professional Information

#### 1. Course Aims:

The aim of this course is to provide the student with the basic embryology knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

#### 2. Intended Learning Outcomes of Course (ILOs)

##### a) **Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Describe the basic embryology of body systems related to pediatric specialty .

##### b) **Intellectual Skills**

By the end of the course, the student is expected to be able to:

- b1. Link between knowledge for professional problem solving.
- b2. Identify different congenital anomalies and suggest possible mechanisms and causes for them.

##### c) **Professional and Practical Skills:**

By the end of the course, the student is expected to be able to:

- c1. Master the basic and modern professional skills in the area of pediatrics through proper diagnosis of different congenital anomalies..

##### d) **General and Transferable Skills:**

By the end of the course, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication .
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice

- d3. Assess himself and identify his personal learning needs.
- d4. Use of different sources for information and knowledge.
- d5. Manage time effectively .
- d6. Maintain Continuous self-learning.

### 3. Contents

subjects	No. of hours	Lecture	Tutorial/ Practical
Introduction to general Embryology	2	2	
Embryology of cardiovascular system	4	4	
Embryology of respiratory system	4	4	
Embryology of the head and neck	4	4	
Embryology of nervous system	4	4	
Embryology of gastrointestinal system	4	4	
Embryology of genitourinary system	4	4	
Embryology of musculoskeletal system	4	4	
<b>Total</b>	<b>30</b>	<b>30</b>	
<b>Credit</b>	<b>2</b>	<b>2</b>	

### 4. Teaching Methods:

- 4.1. Lectures
- 4.2. Practical lessons
- 4.3. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills)

### 5. Methods of Students Assessment:

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.3-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills

### Assessment Schedule

- 1- Assessment 1: written examination                      week 24
- 2- Assessment 2: Structured Oral Exam                      week 24
- 3- Assessment of attendance & absenteeism throughout the course

### Weighting of Assessments



Final-term written examination	0.0%
Structured Oral Exam	0.0%
Total	100%

Formative only assessments: attendance and absenteeism

## 6. List of References

### 6.1- Essential Books (Text Books)

- Fitzgerald M.J.T. (2016): The anatomical basis of medicine and surgery. By Standing s., ELIS H., Healy J. C., Johnson D. and Williams A. Gray's Anatomy. Elsevier; London, New York. Sydney. Toronto.

### 6.2- Recommended Books

- Stevens A. and Lowe J. S. (2015): Human histology; 5<sup>th</sup> edition; edited by Elsevier Mosby

- Colored Atlas of anatomy.

- Martini F. H., Timmons M. J. and McKinley M.P. (2015): Human anatomy; 10 edition.

- Tortora G. J. and Nielson M.T. (2016): Principles of human anatomy 14 edition; Edited by John Wiley and Sons ; United states.

- McMinn R.M.H. (2017): Lasts anatomy regional and applied chapter 7; 14 edition, edited by Longman group UK.

### 6.3- Periodicals, Web Sites, ... etc

- <http://www.ncbi.nlm.gov/>
- [Findarticle.com](http://findarticle.com)
- [Freemedicaljournals.com](http://freemedicaljournals.com)

## 7. Facilities Required for Teaching and Learning

**1- Adequate infrastructure:** Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.

**2- Teaching tools:** Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator: Dr . Mohamed Al-Badry**

**Head of Department: Dr. Mohamed Al-Badry**

**Date: 18/12/2011, Revised:1/9/2012, Revised:1/12/2013, Revised:1/12/2018**

## Course Specifications of Applied biostatistics (with computer use) and Research Methodology in Master degree of Paediatrics

Sohag University

Faculty of Medicine

1. Program title : Master degree in Pediatrics
2. Major/minor element of the program : Minor
3. Department offering the course: Community Medicine and public Health Dep.
4. Department offering the program: Pediatrics
5. Academic year /level : 1st part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

### A. Basic Information

**Title:** Master degree in Pediatrics Statistics and Computer use for health services **and Research Methodology**

**Code:** COM: 0526-200

**Total Hours:**

Title	Lectures	Practical/ surgical	Total	credit
Applied biostatistics and computers & Research methodology	15	30	45	2

### B. Professional Information

#### Applied Biostatistics Module:

#### 1. Overall Aims of Course

##### Applied Biostatistics Module:

- a. To influence the students to adopt an analytical thinking for evidence based medicine.
- b. To use precisely the research methodology in researches and computer programs SPSS, Epi Info and Excel in data analysis.

##### Research Methodology Module:

The aim of this course is to provide the postgraduate student with the advanced medical knowledge and skills essential for the mastery of practice of specialty and necessary to provide further training and practice in the field of Public health and Community Medicine through providing:

1. Recent scientific knowledge essential for the mastery of practice of Public Health and Community Medicine according to the international standards.
2. Skills necessary for preparing for proper diagnosis and management of community problems, skills for conducting and supervising researches on basic scientific methodology.
3. Ethical principles related to the practice in this specialty.
4. Active participation in community needs assessment and problems identification.

5. Maintenance of learning abilities necessary for continuous medical education.
6. Upgrading research interest and abilities.

## **2. Intended Learning Outcomes of Courses (ILOs)**

### **Applied Biostatistics Module:**

#### **a) Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Mention different programs of analysis of data and statistical packages
- a2. Define the recent advances of sources of data and methods of collection.
- a3. Summarize data, construct tables and graphs
- a4. Calculate measures of central tendency and measures of dispersion
- a5. Describe the normal curves and its uses
- a6. Illustrate selected tests of significance and the inferences obtained from such tests
- a7. Illustrate selected tests of significance for parametric and non parametric inferences
- a8. Identify factor analysis and discrimination analysis.

#### **b) Intellectual Skills**

By the end of the course, the student is expected to be allowed to:

- b1. Mention how to collect and verify data from different sources
- b2. Interpret data to diagnose prevalent problems clinical pathology

#### **c) Professional and Practical Skills:**

By the end of the course, the student is expected to practice the following:

- c1. Perform recent advanced technological methods in collection, analysis and interpretation of data and in management of prevalent problems in clinical pathology

#### **d) General and Transferable Skills:**

By the end of the course, the student is expected to be able to:

- d1. Use appropriate computer program packages.
- d2. Use of different sources for information and knowledge about biostatistics.

### **Research Methodology Module:**

#### **a) Knowledge and understanding:**

By the end of the course, the student is expected to be able to:

- a1. Define the recent advances of screening tests pertinent to selected diseases and the at-risk approach in the application of screening tests.
- a2. Explain the usefulness of screening tests, and calculate sensitivity, specificity, and predictive values.
- a3. Describe the study design, uses, and limitations.
- a4. Mention the recent advances of principles, methodologies, tools and ethics of scientific research.
- a5. Explain the strategies and design of researches.
- a6. Describe bias and confounding.
- a7. Describe sampling techniques and list advantages of sampling
- a8. Identify principles of evidence based medicine.

#### **b) Intellectual Skills**

By the end of the course, the student is expected to be able to:

- b1. Conduct research studies that add to knowledge.
- b2. Formulate scientific papers in the area of public health and community medicine
- b3. Innovate and create researches to find solutions to prevalent community health problems
- b4. Criticize researches related to public health and community medicine
- c) **Professional and Practical Skills:**  
By the end of the course, the student is expected to be able to:
  - c1. Enumerate the basic and modern professional skills in conducting researches in the area of public health and community medicine.
  - c2. Design new methods, tools and ways of conducting researches. .
- d) **General and Transferable Skills:**  
By the end of the course, the student is expected to be able to:
  - d1. Use of different sources for information and knowledge to serve research.
  - d2. Work coherently and successfully as a part of a team and team's leadership in conducting researches and field studies.

### 3. Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
<b>Applied Biostatistics Module:</b>			
Recent advances in collection, analysis and interpretation of data	3	1	2
-Details of Tests of significance: Proportion test	3	1	2
-Chi-square test	1.5	.5	1
-Student T test	1.5	.5	1
-Paired T test	1.5	.5	1
-Correlation	1.5	.5	1
-Regression	2	1	1
-ANOVA test	3	1	2
-Discrimination analysis	3	1	2
-Factor analysis	3	1	2
-Parametric and non parametric tests	4.5	.5	4
<b>Research Methodology Module:</b>			
Details of epidemiological studies (case control, cohort and cross sectional )	3	1	2
Clinical trials, Quasi experimental study	3	1	2
Bias and errors	2	1	1
Setting a hypothesis	1.5	.5	1
Recent advances in screening	1.5	.5	1
- Evidence – based Medicine: Concept and examples Applicability Scientific writing: A protocol A curriculum	3	1	2
Setting an objective - Critical thinking	2	1	1

Formulation of papers	1.5	.5	1
<b>Total hours</b>	<b>45</b>	<b>15</b>	<b>30</b>
<b>Total Credit hours</b>	<b>2</b>	<b>1</b>	<b>1</b>

#### 4. Teaching and Learning Methods

- 4.1- Lectures
- 4.2- Practical sessions
- 4.3- Computer search assignments
- 4.4- Computer application

#### 5. Student Assessment Methods

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2-Written Exams: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills, - Practical skills, intellectual skills
5.3-Structured Oral Exams	- Knowledge
5.4Computer search assignment	- general transferable skills, intellectual skills

#### Assessment Schedule

- Assessment 1....Final written exam      Week: 24
- Assessment 2....Final oral exam      Week: 24
- Assessment 3    Attendance and absenteeism throughout the course
- Assessment 4    Computer search assignment performance throughout the course

#### Weighting of Assessments

Final-term written examination	50%
Final oral Examination	50%
Total	100%

**Formative only assessments: attendance and absenteeism and Computer search assignments performance.**

#### 6. List of References

##### Applied Biostatistics Module:

##### 6.1- Essential Books (Text Books)

1-Maxy-Rosenau Public health and preventive medicine, 2008.,Robert Wallace, publisher McGraw-Hill Medical; 15 edition.

##### 6.2- Recommended

##### Books

- 1- Dimensions of Community Based projects in Health Care, 2018. Arxer, Steven L., Murphy, John W.; 1st edition.
- 2- Parks Text Book of Preventive & Social Medicine. 2017., K. Park. BanarsidasBhanot Publishers; 23 edition.
- 3- Clinical Epidemiology: The Essentials, 2013, Robert F., Suzanne W. Fletcher, Grant S., publisher Lippincott Williams & Wilkins; 5 edition.

##### 6.3- Periodicals, Web Sites, ...etc

- 1-American Journal of Epidemiology
- 2-British Journal of Epidemiology and Community Health

3- WWW. CDC and WHO sites

### **Research Methodology Module:**

#### **6.1- Essential Books (Text Books)**

1-Maxy-Rosenau Public health and preventive medicine, 2008.,Robert Wallace, publisher McGraw-Hill Medical; 15 edition.

#### **6.2- Recommended**

- 1- Dimensions of Community Based projects in Health Care, 2018. Arxer, Steven L., Murphy, John W.; 1st edition.
- 2- Parks Text Book of Preventive & Social Medicine. 2017., K. Park. BanarsidasBhanot Publishers; 23 edition.
- 3- Clinical Epidemiology: The Essentials, 2013, Robert F., Suzanne W. Fletcher, Grant S., publisher Lippincott Williams & Wilkins; 5 edition.

#### **Books**

#### **6.3- Periodicals, Web Sites, ...etc**

1-American Journal of Epidemiology

2-British Journal of Epidemiology and Community Health

3- WWW. CDC and WHO

sites

### **7. Facilities Required for Teaching and Learning:**

#### **Applied Biostatistics Module:**

- Adequate conditioned space for staff and assistants.
- Adequate conditioned teaching facilities.
- Audiovisual Aids: Data show, overhead and slide projectors and their requirements.

#### **Research Methodology Module:**

- ADEQUATE INFRASTRUCTURE: including teaching places (teaching class, teaching halls, teaching laboratory), comfortable desks, good source of aeration, bathrooms, good illumination, and safety & security tools.
- TEACHING TOOLS: including screens, computers including cd (rw), data shows, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printers.

**Course Coordinator: Dr/Rasha Abd El-Hameed**

**Head of Department: Prof/ Ahmed Fathy Hamed**

**Date: 18/12/2011, Revised:1/9/2012, Revised:1/12/2013, Revised:1/12/2018**

## Course Specifications of Paediatrics for Master degree in Paediatrics

Sohag University

Faculty of Medicine

1. Program Title: Master degree in Pediatrics
2. Minor/major element of the program: Major
3. Department offering the program: Pediatrics Department
4. Department offering the course: Pediatrics Department
5. Academic year/level: Second part
6. Date of specification approval: Faculty council No. "317", decree No. "1533" dated 17/12/2018

### A. Basic Information

**Title: Paediatrics for Master degree in Paediatrics**

**Code: PED 0526-200**

**Total hours:**

Module	Lectures	Tutorial/clinical	Total hours
pediatrics	150 hours	240 hours	390hours
Genetics , growth and development	30 hours	30 hours	60 hours
Neonatology , nutrition and child health	30 hours	30hours	60 hours

### B. Professional Information:

#### 1. Course Aims:

##### Pediatrics module

The aim of this course is to provide the student with the basic pediatric knowledge and skills essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

##### Genetics , growth and development module

- The aim of this course is to provide the postgraduate with the basic knowledge and skills of children growth and development and genetic diseases of children essential for the practice of Pediatric specialty and necessary for further training and practice in the field of Pediatrics.

##### Neonatology , nutrition and child health module

The aim of this course is to provide the student with the basic knowledge and skills of neonatology, and knowledge of childhood nutritional requirements and their effects on child health, which are essential for the practice of Pediatric specialty and necessary to gain further training and practice in the field of Pediatrics.

#### 2. Program Intended Learning Outcomes (ILOs)

##### Pediatrics module

##### a) Knowledge and Understanding:

By the end of the program, the student is expected to be able to :

- a1. Mention common pediatric diseases and their causations .
- a2. Describe methods of diagnosis of pediatric diseases and their complications.

- a3. Mention principles of the management of pediatric diseases.
- a4. List methods of prevention of pediatric diseases.
- a5. Mention scientific development in the field of pediatrics .
- a6. Mention the mutual influence between professional practice and its impacts on the environment.
- a7. Mention Ethical and legal principles of professional practice in the field of pediatrics.
- a8. Mention The principles and fundamentals of quality of professional practice in the field of pediatrics.
- a9. Mention The basics and ethics of scientific research.

**b) Intellectual Skills**

By the end of the program, the student is expected to be able to:

- b1. Interpret data acquired through history taking to reach a provisional diagnosis for pediatric problems .
- b2. Select from different diagnostic alternatives the ones that help reaching a final diagnosis for pediatric problems.
- b3. Link between knowledge for professional problem solving .
- b4. Conduct research studies and / or write a scientific study on a research problem.
- b5. Assess Risk in professional practices in the field of pediatrics.
- b6. Plan to develop performance in the field of pediatrics.
- b7. Identify different pediatric problems and find solutions for them.
- b8. Analyze researches related to pediatrics.

**c) Professional and Practical Skills**

By the end of the program, the student is expected to be able to:

- c1. Master the basic and modern professional skills in the area of pediatrics.
- c2. Write and evaluate of medical reports.
- c3. Assess methods and tools existing in the area of pediatrics.

**d) General and Transferable Skills**

By the end of the program, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication.
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice.
- d3. Assess himself and identify his personal learning needs.
- d4. Use different sources for information and knowledge.
- d5. Teach others and evaluate their performance.
- d6. Work coherently and successfully as a part of a team and as a team leader
- d7. Manage time efficiently.
- d8. Maintain Continuous self-learning.

**Genetics , growth and development module**

**a) Knowledge and Understanding:**

By the end of the program, the student is expected to be able to :

- a1. Mention methods of evaluating normal and abnormal patterns of growth and development of infants and children .
- a2. List genetic diseases and ways of their diagnosis and the concepts of genetic counseling.

**b) Intellectual Skills**

By the end of the program, the student is expected to be able to:



- b1. Interpret data acquired through history taking to reach a provisional diagnosis for pediatric problems .
- b2. Select from different diagnostic alternatives the ones that help reaching a final diagnosis for pediatric problems.
- b3. Link between knowledge for professional problem solving .
- b4. Conduct research studies and / or write a scientific study on a research problem.
- b5. Assess Risk in professional practices in the field of pediatrics.
- b6. Plan to develop performance in the field of pediatrics.
- b7. Identify different pediatric problems and find solutions for them.
- b8. Analyze researches related to pediatrics.

**c) Professional and Practical Skills**

By the end of the program, the student is expected to be able to:

- c1. Master the basic and modern professional skills in the area of pediatrics.
- c2. Write and evaluate of medical reports.
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By the end of the program, the student is expected to be able to:

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- d3. Assess himself and identify his personal learning needs.
- d4. Use different sources for information and knowledge.
- d5. Teach others and evaluate their performance.
- d6. Work coherently and successfully as a part of a team and as a team leader
- d7. Manage time efficiently.
- d8. Maintain Continuous self-learning.

**Neonatology , nutrition and child health module**

**a) Knowledge and Understanding:**

By the end of the program, the student is expected to be able to:

- a1. Mention principles of the care of term and preterm newborn babies
- a2. Describe the nutritional requirements of infants and children and nutritional abnormalities.

**b) Intellectual Skills**

By the end of the program, the student is expected to be able to:

- b1. Interpret data acquired through history taking to reach a provisional diagnosis for pediatric problems.
- b2. Select from different diagnostic alternatives the ones that help reaching a final diagnosis for pediatric problems.
- b3. Link between knowledge for professional problem solving .
- b4. Conduct research studies and / or write a scientific study on a research problem.
- b5. Assess Risk in professional practices in the field of pediatrics.
- b6. Plan to develop performance in the field of pediatrics.
- b7. Identify different pediatric problems and find solutions for them.
- b8. Analyze researches related to pediatrics.

**c) Professional and Practical Skills**

By the end of the program, the student is expected to be able to:

- c1. Master the basic and modern professional skills in the area of pediatrics.

- c2. Write and evaluate of medical reports.
- c3. Assess methods and tools existing in the area of pediatrics.

**d) General and Transferable Skills**

By the end of the program, the student is expected to be able to:

- d1. Communicate effectively by different types of effective communication.
- d2. Use appropriate computer program packages and the internet to serve the development of professional practice.
- d3. Assess himself and identify his personal learning needs.
- d4. Use different sources for information and knowledge.
- d5. Teach others and evaluate their performance.
- d6. Work coherently and successfully as a part of a team and as a team leader
- d7. Manage time efficiently.
- d8. Maintain Continuous self-learning.

**3. Course Contents**

**Pediatrics module**

Topic	Total number of hours	lecture	practical
Pediatric emergency	35	10	25
Infectious diseases	35	10	25
Respiratory system	35	10	25
Cardiovascular system	40	15	25
Gastrointestinal system	35	10	25
Liver diseases	20	10	10
Urinary system	20	10	10
Blood	20	10	10
Tumors	20	10	10
Endocrinal system	20	10	10
Metabolic disorders	20	10	10
Nervous system	35	10	25
Immunological, allergic and rheumatic disorders	22	6	16
Bones	22	6	16
Skin	22	6	16
Community problems in pediatric practice in Egypt	6	3	3
Ethical aspects of pediatric practice	6	3	3
Principles and methods of continuous medical education	6	3	3
Principles of evidence based medicine in pediatric practice	6	3	3
<b>Total</b>	<b>390</b>	<b>150</b>	<b>240</b>
<b>Credit</b>	<b>18</b>	<b>10</b>	<b>8</b>

**Genetics, growth and development module**

Subject	Total number of hours	Lectures	Practical
<b>Growth and development:</b>			
-Importance of studying growth and development	1	1	----

-Assessment of growth	4	2	2
-Normal growth	4	1	2
-Growth charts	5	2	2
-Abnormal growth	4	2	2
-Developmental milestones	3	1	1
-Fields of development	3	1	1
-Developmental assessment	4	2	1
-Normal development	3	1	1
-Delayed development	5	2	2
<b>Genetics :</b>			
-Introduction to human genetics	1	1	----
-Structure of chromosome	3	3	----
-Chromosomal abnormalities	11	3	6
-Gene abnormalities	11	3	6
-Methods of genetic diagnosis	10	2	4
-Gene therapy	1	1	----
-Antenatal diagnosis of genetic disease	2	2	----
<b>Total</b>	<b>60</b>	<b>30</b>	<b>30</b>
<b>Credit</b>	<b>3</b>	<b>1</b>	<b>2</b>

#### Neonatology , nutrition and child health module

Subject	Total number of hours	Lectures	Practical
<b>Nutrition:</b>			
-Nutritional requirements	1	1	----
-Breast & formula feeding	1	1	----
-Weaning	2	2	----
-Protein energy malnutrition	10	2	6
-Childhood obesity	4	2	1
-Vitamins in health and diseases	3	1	1
-Food allergy	3	1	1
<b>Neonatology:</b>			
- Maternal drugs and diseases affecting neonate	1	1	----
-Neonatal resuscitation	6	2	3
-Birth trauma	3	1	1
-Birth asphyxia	5	1	3
- Problems of prematurity	6	3	2
-Respiratory diseases of neonate	6	3	2
-Cardiovascular diseases of neonates	5	2	2
-Neonatal jaundice			
-Neonatal sepsis	5	2	2

-Neonatal convulsions	5	2	2
-Dysmorphic neonate	4	1	2
- Ethical problems in neonates	4	1	2
	1	1	----
<b>Total</b>	60	30	30
<b>Credit</b>	3	2	1

#### **4. Teaching Methods:**

- 4.1. Lectures
- 4.2. Clinical lessons
- 4.3. Attending and participating in scientific conferences, workshops and thesis discussions. (To acquire the general and transferable skills)

#### **5. Methods of Students Assessment:**

Method of assessment	The assessed ILOs
5.1- Observation of attendance and absenteeism.	- General transferable skills, intellectual skills
5.2- Log book	- General transferable skills
5.3-Written Exam: -Short essay: 40% -structured questions: 25% -MCQs: 20% -Commentary, Problem solving: 15%	- Knowledge - Knowledge - Knowledge, intellectual skills - Intellectual skills, General transferable skills,
5.4-Structured Oral Exam	- Knowledge, Intellectual skills, General transferable skills
5.5-OSCE	-Practical skills, intellectual skills General transferable skills

#### **Assessment schedule:**

<b>Assessment</b>	final written exam	week96
<b>Assessment</b>	OSCE	week96
<b>Assessment</b>	final Structured Oral Exam	week96

#### **Weighting of Assessments**

Final- written Examination	50%
Structured Oral Examination	30%
OSCE	20%
Total	100%

Formative only assessments: attendance and absenteeism

#### **6. List of References**

##### **6.1- Essential Books (Text Books)**

- 1- Nelson essential of pediatrics, 2018
- 2- Current diagnosis and treatment of pediatrics, 2018

##### **6.2- Recommended Books**

- 1- Nelson textbook of pediatrics, 2018
- 2 – Forfar textbook of pediatrics, 2010

##### **6.3- Periodicals, Web Sites, ... etc**

- American journal of pediatrics  
Archives of diseases of childhood  
New England journal of medicine

**Websites :**

[www.pediatrics.com](http://www.pediatrics.com)  
[www.pediatriceducation.com](http://www.pediatriceducation.com)  
[www.ncbi.nlm.gov](http://www.ncbi.nlm.gov)

**7. Facilities Required for Teaching and Learning**

**1- Adequate infrastructure:** Including teaching places, comfortable desks, good source of aeration, bathrooms, good illumination, safety and security tools.

**2- Teaching tools:** Including screens, computers, data show, projectors, flip charts, white boards, video player, digital video camera, scanner, copier, color and laser printer.

**Course Coordinator:** Dr. Ahmed Mohamed Monir

**Head of the Department:** Dr. Mostafa Abo Sedara

**Date: 18/12/2011, Revised:1/9/2012, Revised:1/12/2013, Revised:1/12/2018**