**Beni-Suef University**
**Faculty of Veterinary Medicine**
**Department of Toxicology and forensic medicine**

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# Program Specification for Ph Degree
# 2017-2018

## A-Basic information:

**1- Course title:** *PhD VSC.* **Specialty:-**
2- **Program type:** *Single*
3- **Department offering program:**
4- **Academic year:** *2017-2018*
5- **Approval date of Department Council:**
6- **Approval date of Faculty Council:**
**7-External evaluator:**

## B-Professional information:

### 1- Overall aims of the program:

1-The aim of the course is to provide the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……).
2- Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields.
3-It also aims to provide some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology.

## 2- Intended learning outcomes of course (ILOs):

### a- Knowledge and understanding:

### By the end of this PhD program the graduate should be able to:

**a**.1. Recognize the general principles of toxicology, absorption, distribution, metabolism, and excretion of toxicants, classification of toxicants (Nano particles toxicity, heavy metals, insecticides, aflatoxin, animal poison, plant poison….).

a.2. Describe the principles and concepts of mutagenesis and chemical carcinogenicity, reproductive and developmental toxicology.

a3. Recognize the principles of Immunotoxicology, of neurotoxicity, the anatomy and physiology of the lungs, liver, skin, and kidneys, and the mechanisms of related organ toxicity.

a4. Recognize In vitro toxicity testing and the basic principles of risk assessment applications.
a5. Identify the different forensic branches , anthropology, odontology, entomology…..
a6- Describe the science behind physical evidence, including: Hair and fibers, Fingerprints and physical matching, Blood spatter, Serology and DNA ,Ballistics and firearms ,Paint and road traffic accident evidence ,Narcotics ,Clandestine graves.

a7- Identify ill legal usage of doping agents, animal abuse , different methods of animal euthanasia and Necropsy protocols.

a8-Detecte the advanced instrumentation and the analytical methods used

for environmental evaluations

a9. Identify the aquatic toxicology(sources, toxic effects on aquatic system, lab.analysis and assessment, control and management)
a10. Define the different nano particles, radiation and radioactive materials pollutions and the methods for minimizing their effects

### b- Intellectual capacity:

### By the end of this PhD program the graduate should be able to:

- b1. Correlate the main factors affecting the quality of chemical analysis data for environmental systems, including issues affecting accuracy, uncertainty and detection limits in analytical methods. Evaluate risk assessment and environmental monitoring.

b2. Deal with Tools for Complex Data Analysis. Assess the toxicological impacts for aqua culture.

b3.Advanced methods for collect, analyze and document evidence in a forensic case. Differentiate between suicidal, accidental or homicidal injuries

b4- Diagnose different types of **Ballistic imagining techniques. Advanced methods for Gunshot residue chemical analysis**

b5- detect the different **Quantitative PCR in forensic science**

b6. Assess the toxicological impacts for different organ toxicity.

b7. Estimate the socio-economic for ideal poisoning treatment.

## c- Professional and practical skills:
## By the end of this PhD program the graduate should be able to:

c1. Employ to follow the NIH and WHO guidelines of safety.

c2. Practice in different methods of sampling and preparation of samples for laboratory analysis. Perform advanced methods for poison detection.

C3. Control and treat the different expected poisoning cases in animals.

C4. Assesment of cell toxicity.

C5- Write a medico-legal report in English and Arabic..

C6- Apply methods for identification of **Animal cruelty**

C7- Recognize different forensic samples (hair fibers & blood), ideal **DNA extraction techniques for Forensic Analysis,** advanced methods for meat adulteration detection and Interpret the data obtained from the forensic lab.

- C8. Employ the many aspects playing a role in environmental toxicological research and the consequences for a rational choice of toxicological research methods.

C9. Perform different advanced methods of environmental pollutants detection. . Demonstrate awareness of the enormous uncertainties that policy makers are dealing with, and explain how they use the results of toxicological research for risk assessment.

C10. Protect the aqua life from different sources of expected pollutions.

**d- General and transferable skills:**

**On successful completion of this program the graduate should be able to:**

dl- Demonstrate an ability to learn independently in preparation for a career of lifelong learning .

d2- Demonstrate interpersonal skills and team working ability by the successful completion of collaborative learn assignment and the honors researches projects

d3- present research finding in oral and written from using arrange of appropriate soft ware ( e.g., power point , word , excel and data base ).

**3- Academic standers:**

* The faculty mission, vision and strategic objective are confirmed to the academic standard. The learning outcomes are inline with the department and the faculty mission.

* Postgraduates NARS (March 2009) Master degree chapter issued by national authority for quality assurance and accreditation of education (NAQAAE) and Veterinary medicine post graduate academic standards (ARS) for the faculty of veterinary medicine, Beni-Suef University, Beni-Suef, Egypt are selected to confirm the appropriateness of the academic standards .

ARS (National Academic Reference Standards) prepared by NAQAAE.

## 4- Curriculum Structure and Contents

**a-Program duration**: 48 weeks.

**b-Program structure: 3-5 preliminary courses**

☒ **Hours/ week:**

Theoretical | 5-8 | Practical | 6-8 | Total | 11-16

**Preliminary courses**

| Code | Course title | Hours /week | | Academic year | Teaching duration |
|---|---|---|---|---|---|
| | | theoritical | practical | | |
| According to selected courses | Selected (3-5) PhDcourses from the various Faculty Departments programs depending on the thesis title. | 5-8 | 6-8 | Preliminary year | 36 weeks |

**D- Courses contents**

**See courses specification**

## 5- Program Admission Requirements

* According to the Faculty of Veterinary Medicine, Beni-Suef University Bylaws for Post Graduate Programs, applicants should have a master degree in the specialization subject he will register in one of the Egyptian Universities or an equivalent degree from any approved university or another recognized scientific institute.
* According to Beni-Suef University requirements, all applicants for postgraduate studies should fulfill preliminary courses on the following subjects:
1-English language (Toefl or equivalent degree)

* Admission to the program is open during March and September annually.

*The faculty council has the right to suspend the student enrolment for a certain period if he has acceptable

excuse preventing him from continuing his study or research.

## 6. Regulations for Progression and Program Completion

After finishing the preliminary courses, the graduate student will be eligible to sit for the examination according to the following roles:

| No. of course teaching hours/ week | Allowed written examined time | Degree | |
|---|---|---|---|
| | | Theoretical | Practical and oral exam |
| **≥ 3 hours** | 3 hours | 50 | 50 |
| **≤ 3 hours** | 2 hours | 25 | 25 |

-The faculty council has the right to deprive the applicant from entering the exams if his attendance courses is less than 75% .

-Failure or depriving from entering one or more course did not requires reexamination of successful passed courses.

-The applicant should submit a seminar within 2years after registration about his research and specialization subject filed that accepted by a committee of professors and assistant professors(3 in number).

-the applicant should submit the thesis that accepted by the judging committee in an open discussion and the following polices should be met:

-pass all preliminary curriculums successfully.

-acceptance of the seminar presented by the applicant.

-The applicant should publish at least two scientific papers from the thesis in local or international journals

**Qualification grades:**

| | |
|---|---|
| **Excellent** | ≥ 90 |
| **Very good** | ≥80 |

| | |
|---|---|
| **Good** | ≥70 |
| **Pass** | ≥60 |
| **Failed** | 45 to less than 60 weak |
| | Less than 45 Very weak |

After passing, the graduate starts research for Ph.D. Thesis at the beginning of the second year.
The candidate will receive his degree after evaluating and approving the thesis by a committee according to University regulations.

## 7-Graduate student assessment

**A: Assessment Tools**

According the Faculty of Veterinary Medicine, Beni-Suef University Bylaws for Post Graduate, students should be assessed at the end of preliminary year and the thesis should be evaluated and approved by a committee after at least three years from registration date according to University regulations.

**Preliminary year**

| **Assessments methods for each course** | **practical exam** | **Oral exam** | **Written exam** |
|---|---|---|---|
| **Time of Assessments** | By the end of the year | By the end of the year | By the end of the year |
| **Marks** | 25 | 25 | 50 |

**Ph.D. Thesis:**

The Ph.D. students should prepare a thesis in veterinary forensic medicine and toxicology The department and the ethical committees must approve the protocol of the research. The thesis includes a review part with a practical part. The thesis is supervised by two or more staff members and may include other specialties according to the

nature of the research. The thesis should be evaluated and approved by a committee according to University regulations.

| Assessments methods | Matrix alignment of the measured ILOs |
|---|---|

**B- Matrix alignment of the measured ILOs**

## 8- Evaluation of Program Intended Learning Outcomes

| | K&U (a) | I.S (b) | P&P. S (c) | G&T. S (d) |
|---|---|---|---|---|
| **Written exam** | a1,a2,a3,a5,a9,a10 | b1, b6,b7 | c1,c3c,5,c6c,8,c10 | |
| **Practical exam** | | b2.b3.b4.b5. | c2,c4,c7,c9 | d1,d2 |
| **Oral exam** | a1,a2,a3,a4,a5,a9 | b1,b2,b4,b7,b6, | c1,c3,c8,c9,c10 | d1,d3,d4, , |

| Evaluator | Tool | Sample |
|---|---|---|
| 1. Post graduate Students | Questionnaire at the end of the program | All the PG students |
| 4. External Evaluators | Review program and courses Attending the final exam | Once before implementation annual report |
| 5. College Quality Assurance committee | Annual program reviewer | |

# PhD Program Specification Matrix (Program Courses with ILOS)

| Program ILOs | | Courses |
|---|---|---|
| **Knowledge and understanding** | a1 | M149+ M152+88+Thesis |
| | a2 | M149+M151+33 and Thesis |
| | a3 | M148+M151+200 |
| | a4 | M149+M151+33 |
| | a5 | M152+M150 |
| | a6 | M152+M150+39 |
| | a7 | M150+39+212 |
| | a8 | M150+39 |
| | a9 | M149+ M152 |
| | a10 | M149+M151+33 |
| **Intellectual skills** | b1 | M148+M152 and thesis |
| | b2 | M148+M152 and thesis |
| | b3 | M151+M152 |

| | | |
|---|---|---|
| | b4 | M149+M151+33 and thesis |
| | b5 | M149+M151+33 |
| | b6 | M149+M151+33 |
| | b7 | M149+M151+33 and Thesis |
| **Professional and practical skills** | | |
| | c1 | M149+ M152 and thesis |
| | c2 | M149+ M152 and thesis |
| | c3 | M149+ M152 and thesis |
| | c4 | M149+ M152and thesis |
| | c5 | M149+ M152and thesis |
| | c6 | M152+M150+thesis |
| | c7 | M152+M150 |
| | c8 | M149+ M152+88+Thesis |
| | c9 | |
| | c10 | M149+ M152+88+Thesis |
| **General and transferable skills** | | |
| | **d1** | M150+39+212and thesis |
| | **d2** | M149+M151+33and thesis |
| | **d3** | M149+M151and thesis |
| | **d4** | M149+M151and thesis |

## Program aims – ILOS Matrix for the Ph.D Degree
## مصفوفة اهداف البرنامج مع مخرجات التعلم المستهدفة

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| Knowledge and understanding | **a**.1. Recognize the general principles of toxicology, absorption, distribution, metabolism, and excretion of toxicants, classification | | | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | of toxicants (Nano particles toxicity, heavy metals, insecticides, aflatoxin, animal poison, plant poison….). | | | |
| | a.2. Describe the principles | | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | and concepts of mutagenesis and chemical carcinogenicity, reproductive and developmental toxicology. | | | √ |
| | a3. recognize the principles of Immunotoxicology, of neurotoxicity, | √ | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | the anatomy and physiology of the lungs, liverand kidneys, and the mechanisms of related organtoxicity. | | | √ |
| | a4. Recognize the toxic effects in different organs and the corresponding organ toxicity testing and monitor the | √ | √ | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | effects of different environmental hazards.<br>. | | | |
| | a5. Identify the different forensic branches , anthropology, odontology, entomology….. | | √ | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | a6- Describe the science behind physical evidence, including: Hair and fibers, Fingerprints and physical matching, Blood spatter, Serology and DNA ,Ballistics and firearms ,Paint and road traffic accident evidence ,Narcotics ,Clandestine graves. | √ | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | | | | |
| | a7- Identify ill legal usage of doping agents, animal abuse , different methods of animal euthanasia and Necropsy protocols | √ | √ | |
| | a8- detecte the advanced instrumentation and the | | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | analytical methods used for environmental evaluations | | | √ |
| | a9. Identify the aquatic toxicology(sources, toxic effects on aquatic system, lab.analysis and assessment, control and management) | | √ | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | | | | |
| | a10. Define the different nano particles, radiation and radioactive materials pollutions and the methods for minimizing their effects | | | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| Intellectual skills | - b1. Correlate the main factors affecting the quality of chemical analysis data for environmental systems, including issues affecting accuracy, uncertainty and detection limits in analytical methods. | | √ | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | Evaluate risk assessment and environmental monitoring. | | | |
| | b2. Deal with Tools for Complex Data Analysis. Assess the toxicological impacts for aqua culture. | √ | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | b3.Advanced methods for collect, analyze and document evidence in a forensic case. Differentiate between suicidal, accidental or homicidal injuries | | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | b4- Diagnose different types of **Ballistic imagining techniques. Advanced methods for Gunshot residue chemical analysis** | | | √ |
| | b5- detect the different **Quantitative PCR in forensic science** | | | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | | | | |
| | b6. Assess the toxicological impacts for different organ toxicity.<br><br>b7. Estimate the socio-economic for ideal poisoning treatment. | | | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| Practical and professional skills | c1. Employ to follow the NIH and WHO guidelines of safety. | | √ | |
| | c2. Practice in different methods of sampling and preparation of samples for laboratory analysis. Perform advanced methods for | | | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | poison detection. | | | |
| | C3. Control and treat the different expected poisoning cases in animals | | | √ |
| | C4. Assesment of cell toxicity. | | √ | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | | | | |
| | C5- Write a medico-legal report in English and Arabic.. | | √ | |
| | C6- Apply methods for identification of **Animal cruelty** | √ | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | C7- Recognize different forensic samples (hair fibers & blood), ideal **DNA extraction techniques for Forensic Analysis,** advanced methods for meat adulteration detection and Interpret the data obtained from | | | √ |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | the forensic lab | | | |
| | - C8. Employ the many aspects playing a role in environmental toxicological research and the consequences for a rational choice of toxicological research methods. | | √ | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | | | | |
| | C9. Perform different advanced methods of environmental pollutants detection. . Demonstrate awareness of the enormous uncertainties that policy makers are dealing with, and explain how they use the results of toxicological | √ | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | research for risk assessment. | | | |
| | C10. Protect the aqua life from different sources of expected pollutions. | | √ | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | | | | |
| general and transferable skills | dl- Demonstrate an ability to learn independently in preparation for a career of lifelong learning . | | | √ |
| | d2- Demonstrate interpersonal skills and team working ability by the successful completion of collaborative learn assignment and the honors | √ | | |

| Program ILOS | | Program aims | | |
|---|---|---|---|---|
| | | 1- providing the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). | 2 Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects, provide a career jump for many professionals, including those in the medical and criminal justice fields. | 3- providing some information of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology. |
| | researches projects | | | |
| | d3- present research finding in oral and written from using arrange of appropriate soft ware ( e.g., power point , word , excel and data base ). | | √ | |

# PhD Program Specification Matrix (Program ILOS with Academic standers ARS)

| **Academic standers**<br><br>**Program ILOs** | | **Knowledge and understanding** | | | | | Intellectual skills | | | | | | | | | Professional and practical skills | | | | | **General and transferable skills** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **a1** | a2 | **a 3** | a4 | **a5** | **b 1** | **b 2** | **b 3** | **b 4** | **b 5** | **B 6** | **B 7** | **B 8** | **B 9** | **c1** | **c 2** | **c3** | **c4** | **C 5** | **d 1** | **d 2** | **d 3** | **D 4** | **D5** | **D6** | **D7** |
| Knowledge and understanding | a1 | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | |
| | **a2** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **a3** | √ | √ | √ | | | | | | | | | | | | | | | | | | | | | | | |
| | **a4** | | | √ | | √ | | | | | | | | | | | | | | | | | | | | | |
| | **a5** | | √ | | | | | | | | | | | | | | | | | | | | | | | | |
| | **a6** | | √ | | | | | | | | | | | | | | | | | | | | | | | | |
| | **a7** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **a8** | √ | √ | | | | | | | | | | | | | | | | | | | | | | | | |
| | **a9** | | | | | √ | | | | | | | | | | | | | | | | | | | | | |
| | **a10** | | | | | √ | | | | | | | | | | | | | | | | | | | | | |
| Intellectual skills | b1 | | | | | | √ | | | | √ | | | | √ | | | | | | | | | | | | |
| | **b2** | | | | | | √ | | | | | | | | | | | | | | | | | | | | |
| | **b3** | | | | | | | | | √ | | √ | | | | | | | | | | | | | | | |
| | **b4** | | | | | | √ | | | | | | | | | | | | | | | | | | | | |
| | **b5** | | | | | | | | √ | | | | | | | | | | | | | | | | | | |
| | **b6** | | | | | | | | | √ | √ | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **b7** | | | | | | | √ | | √ | | | | √ | | | | | | | | | | | | | | |
| Professional and practical skills | c1 | | | | | | | | | | | | | | | √ | | | | | | | | | | | | |
| | **c2** | | | | | | | | | | | | | | | √ | | | √ | | | | | | | | | |
| | **c3** | | | | | | | | | | | | | | | | | | | √ | | | | | | | | |
| | **c4** | | | | | | | | | | | | | | | | √ | | | | | | | | | | | |
| | **c5** | | | | | | | | | | | | | | | | √ | | | | | | | | | | | |
| | **c6** | | | | | | | | | | | | | | | | | √ | | | | | | | | | | |
| | **c7** | | | | | | | | | | | | | | | | | √ | | | | | | | | | | |
| | **C8** | | | | | | | | | | | | | | | | | | √ | | | | | | | | | |
| | **C9** | | | | | | | | | | | | | | | | | √ | √ | | | | | | | | | |
| | **C10** | | | | | | | | | | | | | | | | | √ | | | | | | | | | | |
| **General and transferable skills** | **d1** | | | | | | | | | | | | | | | | | | | | | | √ | √ | | | | |
| | **d2** | | | | | | | | | | | | | | | | | | | | | | | | √ | | | |
| | **d3** | | | | | | | | | | | | | | | | | | | | | | | | | √ | √ | |

**Course coordinator** **Head of the Department**

Beni-Suef University
Faculty of Veterinary Medicine

# Course Specification of Postgraduate

## 1-Basic information

| | |
|---|---|
| **Course Code:** | Ph-149 |
| **Course title :** | Advanced General Toxicology |
| **Program title:** | Toxicology and Forensic Medicine, Post graduate students (PhD) |
| **Contact hours/ week** | 4 hours/ week, (2 Lect./week, 2 Practical/week) |
| **Approval Date** | |

## 2-Professional information

**Overall aims of course**:

**This course aims to:**

The aim of the course is to provide the student with the fundamental concepts of toxicology as they relate to specific organ and tissue systems (neurotoxicology, nephrotoxicity, hepatotoxicity……). As well as Appropriate risk assessment experimentation and expert judgment to minimize the probability of the occurrence of adverse effects.

## 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

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

**a**.1.Understand the general principles of toxicology.

a.2.Understand the scientific principles of absorption, distribution, metabolism, and excretion of toxicants.

a.3. Recognize classification of toxicants (Nano particles toxicity, heavy metals, insecticides, aflatoxin, animal poison, plant poison….).s

a.4.Understand the principles and use of toxicokinetics.

a.5. Describe the principles and concepts of mutagenesis and chemical carcinogenicity,

a.6. Recognize the principles and concepts related to reproductive and developmental toxicology.

a.7. Understand the principles of Immunotoxicology, including the biology of the immune response, types of immune reactions and disorders.

a.8.Understand the principles and concepts of neurotoxicity.

# Course Specification of Postgraduate

a.9.Understand the anatomy and physiology of the lungs, liver, skin, and kidneys, and the mechanisms of related organ toxicity.

a.10. Understand the principles and concepts behind chemically-induced toxicity of the blood.

A11. Recognize In vitro toxicity testing.

a.12. Recognize the basic principles of risk assessment applications.

**b-Intellectual skills**

**The students will be able to:**

b1. Differentiate agents that affect neuronal and synaptic transmission and appropriate neurotoxicity evaluation.

b2. Evaluate methods of organ damage by toxic agents.

b3. Assess the toxicological impacts for different organ toxicity.
b4. Estimate the socio-economic for ideal poisoning treatment.

**C- Professional and practical skills**

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

c1. Employ to follow the NIH and WHO guidelines of safety.

c2. Practice in different methods of sampling and preparation of samples for laboratory analysis.

c3. Perform advanced methods for poison detection.

c4. Monitor the main organ target for toxicants.

c5. controland treat the different expected poisoning cases in animals.

C6. Assesment of cell toxicity.

C7.Perform clinical and laboratory tests used in detecting different toxic compounds

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

d1. Work effectively in a team work.

d2. Efficiently make use of library facilities and IT tools.

d3. Self learning though explore appropriate computer / keyboard skills including word processing, spreadsheets, presentation packages and graph plotting.

# Course Specification of Postgraduate

d4. Undertake written assignments and oral presentations.

d5.Participate in department projects.

**4-Topics and contents**

| Time/ Week | Topics | No. of hours | Credit Hours/week | |
|---|---|---|---|---|
| | | | T | P |
| 1 | Toxicological concepts and terminology | 4 | 4 | ------- |
| 2 | Methods of dose calculation for toxicological experiments | 4 | 2 | 2 |
| 3 | Toxicological effects on blood | 4 | 2 | 2 |
| 4 | Inhalation toxicity studies (a): anatomy and physiology | 4 | 4 | |
| 5 | Applied inhalation toxicology: Exposure and sampling | 4 | 2 | 2 |
| 6 | Inhalation toxicity studies (a): Proper methods | 4 | 2 | 2 |
| 7 | Hepatotoxicity and Hepatotoxicity testing | 4 | 2 | 2 |
| 8 | In vitro hepatotoxicity testing | 4 | 4 | |
| 9 | Assessment of Cell Toxicity (a): Current concepts in cell toxicity | 4 | 2 | 2 |
| 10 | Assessment of Cell Toxicity (b): Determination of apoptosis and necrosis | 4 | 2 | 2 |
| 11 | Assessment of Cell Toxicity (c): Detection of covalent binding | 4 | 2 | 2 |
| 12 | Toxicants induce oxidative stress: Assessment of different antioxidant levels | 4 | 2 | 2 |
| 13 | Nephrotoxicity and Nephrotoxicity testing | 4 | 2 | 2 |
| 14 | Neuronopathy and axonopathy | 4 | 4 | |
| 15 | Toxic effects on synapsis and channels | 4 | 4 | ------- |
| 16 | Immunotoxicity | 4 | 2 | 2 |
| 17 | Cardiovascular toxicity | | 4 | ------- |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| | | 4 | | |
| 18 | Male reproductive toxicity | 4 | 2 | 2 |
| 19 | Female reproductive toxicity | 4 | 2 | 2 |
| 20 | Toxic responses of endocrine system | 4 | 4 | |
| 21 | Toxic responses of skin, Dermal sensitization and irritation studies | 4 | 2 | 2 |
| 22 | Toxic responses of respiratory system | 4 | 4 | |
| 23 | Toxic responses of digestive system | 4 | 4 | -- |
| 24 | Toxic responses of ocular and visual system | 4 | 4 | ------- |
| 25 | Toxic responses of the musculoskeletal Ssystem | 4 | 4 | ------- |
| 26 | Mutagenesis | 4 | 4 | ------- |
| 27 | Advanced studies on heavy metal toxicity and lab. diagnosis | 4 | 2 | 2 |
| 28 | Advanced studies on Aflatoxin toxicity and lab. diagnosis | 4 | 2 | 2 |
| 29 | Advanced studies on Pesticides toxicity and lab. diagnosis | 4 | 2 | 2 |
| 30 | Carcinogenesis | 4 | 4 | ------- |
| 31 | Nano-Toxicology | 4 | 4 | |
| 32 | Assessment of toxic effects of nano-particles in the lab. | 4 | 2 | 2 |
| 33 | Methods of Risk Assessment | 4 | 2 | 2 |
| 34 | Seminar and oral presentation | 4 | 2 | 2 |
| 35 | Practical Revision | 4 | | 4 |
| total | | 140 | 92 | 48 |

## 5-Teaching and learning methods

**5.1-** Lecture using PowerPoint presentations.

**5.2-** Learning through tutorials.

**5.3-** Independent reading throughout basic Text books and research papers.

**5.4-** small group discussion

# Course Specification of Postgraduate

## 6-Student assessment

### 6.1. Assessments methods:

| Method | Matrix alignment of the measured ILOs/ Assessments methods | | | |
|---|---|---|---|---|
| | K&U | I.S | P&P.S | G.S |
| Final Exam | a1,a2,a3,a4,a5,a6,a7,a8,a9,a10,a11,a12 | b1-b3 | c1- c2-c4 | d2-d3 |
| Practical Exam | A6-a7,a8 | b1- b2 | C3- c6-c7 | D1-D5 |
| Oral Exam | a1-a2,a3,a4,a9,a10,a12 | b4 | c1- c4- c5 | D4 |

### 6.2. Assessment schedules

| Method | Week(s) |
|---|---|
| Practical exams | according to faculty exam schedule |
| Final exams | according to faculty exam schedule |
| Oral Exam | according to faculty exam schedule |

### 6.3. Weight of assessments

| Assessment | Weight of assessment |
|---|---|
| Practical exams | 25% |
| Final exams | 50 % |
| Oral Exam | 25 % |
| total | 100 % |

## 7- List of references

### 7.1. Notes and books

**Course Notes:** Prepared by departments' staff

- Notebook: Advanced General Toxicology

### 7.2. Essential books:

- Casarett and Doull's Toxicology. The Basic Science of Poisons: Klaassen, C.D., McGraw-Hill, New York.7*th* ed., 2008.
- Introduction to toxicology. Timbrell, J., - 3rd ed., Taylor & Francis, USA< 2003.

### `7.3. Recommended texts:

- Principles and Methods of Toxicology: Hayes, A.W., 5th ed., CRC Press, New York, 2007.
- Handbook of Toxicology: Derelanko, M.J. and Hollinger, M.A., 2nd ed., CRC Press , Boca Raton, 2002.

- **Web Sites, … etc**

- *Toxicol. Appl. Pharmacol.*
- *Toxicol. In vitro.*
- *http://www.toxicology.org/*
- *http://www.ivis.org/advances/Beasley/*
- *http://www.sciencedirect.com/*
-

# Course Specification of Postgraduate

**Course Coordinators** **Head of Department**
Dr. Walaa A. Moselhy Prof. Dr. Khaled Abdou

Assessment of Cell Toxicity (d): Measurement of lipid peroxidation products

Measurement of glutathione and glutathione disulfide

Measurement of glutathione transferases and GGT.

Antioxidant enzymes (a): glutathione peroxidase and catalase

Antioxidant enzymes (b):Superoxide dismutase and glutathione reductase
Antioxidant enzymes (b):Superoxide dismutase and glutathione reductase

# Course specification

| | Topics | week | Intended learning outcomes of course (ILOs) | | | |
|---|---|---|---|---|---|---|
| | | | K and U (a) | I.S (b) | P. P.S. (c) | G.T.S (d) |
| 1 | Toxicological concepts and terminology | 1 | 1 | 1 | 1,2 | 1 |
| 2 | Dose-response relationship | 2 | 2 | 1,2 | 2 | 2 |
| 3 | Classification of poisons and toxic effects | 3 | 2,3 | 1,2 | 2 | 2 |
| 4 | Common causes of animal poisoning | 4 | 3 | 1 | 2 | 1,2 |
| 5 | Transport of poisons across membranes | 5 | 3 | 1 | 2 | 3,4 |
| 6 | Absorption of poisons | 6 | 2 | 1 | 2 | 1 |
| 7 | Distribution and excretion of poisons | 7 | 2 | 1 | 1,2 | 2 |
| 8 | Biotransformation: Phase I | 8 | 2,3 | 1,2 | 2 | 3 |
| 9 | Biotransformation: Phase II | 9 | 3 | 1,2 | 1,2 | 2 |
| 10 | Bioactivation: Free radicals and electrophiles formation | 10 | 3 | 1,2 | 2 | 1 |
| 11 | Mechanistic toxicology (a): Lipid peroxidation and antioxidants | 11 | 2 | 1,2 | 1,2 | 1 |
| 12 | Mechanistic toxicology (b): covalent and non-covalent bindings | 12 | 2,3 | 1,2 | 1,2 | 1 |
| 13 | Mechanistic toxicology (c): Reaction with enzymes | 13 | 2 | 1,2 | 2 | 2,4 |
| 14 | Mechanistic toxicology (d): Interaction with receptor | 14 | 3 | 1,2 | 2 | 1 |
| 15 | Factors affecting toxicological action | 15 | 3 | 1,2 | 2 | 1,3 |
| 16 | Diagnosis of toxicosis | 16 | 8 | 3,4 | 5 | 4 |
| 17 | Treatment of poisoning (a): Supportive | 17 | 3,4 | 5 | 3 | |

# Course specification

| | | | | | | |
|---|---|---|---|---|---|---|
| | measures | | | | | |
| 18 | Treatment of poisoning (b): decontamination | 18 | 24 | 1,4 | 2 | 2 |
| 19 | Treatment of poisoning (c): Common antidotes in veterinary practice | 19 | 3 | 3,5 | 1 | 3 |
| 20 | Toxic responses of blood | 20 | 6 | 3 | 3,5 | 2,4 |
| 21 | Hepatotoxicity | 21 | 7 | 2 | 3 | 1,3 |
| 22 | Nephrotoxicity | 22 | 4 | 5 | 2 | 2,4 |
| 23 | Neuronopathy and axonopathy | 23 | 5,7 | 3,4 | 1 | 3 |
| 24 | Treatment of poisoning (b): decontamination | 24 | 3,8 | 1,3 | 5 | 1 |
| 25 | Treatment of poisoning (c): Common antidotes in veterinary practice | 25 | 3,5 | 5 | 3 | 3 |
| 26 | Toxic responses of blood | 26 | 6,8 | 4 | 2 | 4 |
| 27 | Hepatotoxicity | 27 | 4,7,8 | 3 | 4 | 2,4 |
| 28 | Female reproductive toxicity | 28 | 5,7 | 1 | 2 | 3 |
| 29 | Toxic responses of endocrine system | 29 | 4,7 | 3 | 1,5 | 2 |
| 30 | Toxic responses of skin | 30 | 7,8 | 5 | 3,5 | 1 |
| 31 | Toxic responses of respiratory system | 31 | 4,7 | 3 | 2,3 | 3 |
| 32 | Female reproductive toxicity | 32 | 2,8 | 5 | 4,5 | 4 |
| 33 | Toxic responses of endocrine system | 33 | 1,5 | 3 | 2 | 2 |
| 34 | Toxic responses of skin | 34 | 3,5 | 1 | 5 | 4 |
| 35 | Mutagenesis | 35 | 6,7 | 5 | 3 | 1,2 |
| 36 | Carcinogenesis | 36 | 2,6,8 | 3,4,5 | 1 | 3 |

Beni-Suef University
Faculty of Veterinary Medicine

# Course Specification of Postgraduate

## 1-Basic information

| | |
|---|---|
| **Course Code:** | Ph-150 |
| **Course title :** | Environmental pollution |
| **Program title:** | Toxicology and Forensic Medicine |
| **Contact hours/ week** | 4 hours/ week, (2 Lect./week, 2 Practical/week) |
| **Approval Date** | |

## 2-Professional information

**Overall aims of course**:

**This course aims to:**

Ecotoxicology aims to investigate effects of chemicals on biological systems in order to develop methods for risk assessment and management, as well as to predict ecological consequences. The international Master of Science in Ecotoxicology therefore integrates concepts of Environmental Chemistry, Toxicology, and Ecology and includes Social Sciences and Economics, as well.

It aims to provide fundamental knowledge on major classes of chemicals of environmental concern; the properties of these chemicals; how they are released and transported in the environment; how they interact with living systems to cause a toxic response. It also aims to provide some understanding of how toxic responses can be measured and how chemical and toxicological data can be combined to enable better risk assessment and environmental management decision making, in addition to aquatic toxicology.

**By completion of the course, students should be able to:**

- demonstrate insight into basic principles of environmental toxicology
- describe the different origins, sources and types of environmental pollutants
- Describe
- Describe the chemistry of the environmentally important gases in the atmosphere
- Describe
- Explain the main mechanisms of action of representative examples of environmental toxicants in causing a toxic response in living organisms.
- Describe
- Realize how representative examples of environmental toxicants can be experimentally detected and quantified in complex environmental samples.
- Demonstrate awareness of the great differences between the many possible biological endpoints in environmental toxicology.
- Explain the relatively important role of indirect and/or subtle chronic effects in ecosystems compared to the relatively low importance of acute toxicity

## 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

# Course Specification of Postgraduate

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

a1. Understand the Principles of Ecotoxicology (Sources, classification,contol)

- a2. Recognize the chemical properties and environmental fate of important classes of organic compounds (e.g. pesticides, aromatic hydrocarbons) and inorganic compounds (e.g. heavy metals, organometallic compounds)
- a3. Summarize the effects of anthropogenic chemicals on the chemistry of the troposphere and stratosphere and relate this knowledge to the understanding of major atmospheric pollution issues, namely ozone depletion, the greenhouse effect and photochemical smog.
- a4. Realize how synergistic and antagonistic effects can influence the toxic response to mixtures of chemicals in the environment (toxicant interaction).
- A5. Understand the consequences of substance and ecosystem characteristics for the disposal of these substances in the environment, and their uptake by organisms (including human)

A6. Understand the advanced instrumentation and the analytical methods used for environmental evaluations

a7. Understand the aquatic toxicology(sources, toxic effects on aquatic system, lab.analysis and assessment, control and management)

a8. Define the different nano particles, radiation and radioactive materials pollutions and the methods for minimizing their effects

**b-Intellectual skills**

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

- b1. Correlate the main factors affecting the quality of chemical analysis data for environmental systems, including issues affecting accuracy, uncertainty and detection limits in analytical methods.
  b2. Deal with Tools for Complex Data Analysis
  b3. Assess the toxicological impacts for aqua culture.
- b4. Discuss the applicability of chemical analysis and toxicity data, both individually and together, in risk assessment and environmental monitoring.

**C- Professional and practical skills**

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

- c1. perform methods of analysis for representative examples of environmental toxicants, based on a combination of practical experience and general principles learned in the course.
- c2. Employ the many aspects playing a role in environmental toxicological research and the consequences for a rational choice of toxicological research methods.

  c3. Perform different advanced methods of environmental pollutants detection.
- c4. Demonstrate awareness of the enormous uncertainties that policy makers are dealing with, and explain how they use the results of toxicological research for risk assessment.

  c5. Protect the aqua life from different sources of expected pollutions.

# Course Specification of Postgraduate

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

d1. Work effectively in a team work.

d2. Efficiently make use of library facilities and IT tools.

d3. Self learning though explore appropriate computer / keyboard skills including word processing, spreadsheets, presentation packages and graph plotting.

d4. Undertake written assignments and oral presentations.

d5.Participate in department projects.

**4-Topics and contents**

| Time/ Week | Topics | No. of hours | Credit Hours/week | |
|---|---|---|---|---|
| | | | T | P |
| 1 | Recall Types and sources of environmental pollutants | 4 | 4 | ------- |
| 2 | Risk assessment of environmental pollution (acute exposure) | 4 | 2 | 2 |
| 3 | Risk assessment of environmental pollution (chronic exposure) | 4 | 2 | 2 |
| 4 | Optimum storage methods for environmental samples (short-term and long-term) | 4 | 2 | 2 |
| 5 | Atmospheric layers and importance of each layer | 4 | 4 | ------- |
| 6 | Different types of air pollution samples | 4 | 2 | 2 |
| 7 | analytical methods used for air pollution assessments | 4 | 2 | 2 |
| 8 | Case study of the toxic effects of air pollution acute and chronic effects | 4 | 2 | 2 |
| 9 | Field study to areas has significant air pollution | 4 | 2 | 2 |
| 10 | Interpretation and conclusion from the field study, trying to map the air pollution areas | 4 | 2 | 2 |
| 11 | advanced methods for minimization of air pollution | 4 | 2 | 2 |
| 12 | Case study dealing with hydrocarbons adverse effects | 4 | 2 | 2 |
| 13 | Nano-particles as air pollutants, sources and its major effects | 4 | 2 | 2 |
| 14 | assays and open discussion on air pollution | 4 | 2 | 2 |
| 15 | water sampling | 4 | 2 | 2 |
| 16 | Instrumentation used for water assessments | 4 | 2 | 2 |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| 17 | analytical methods used for water pollution assessments | 4 | 2 | 2 |
| 18 | Case study of the toxic effects of water pollution acute and chronic effects | 4 | 2 | 2 |
| 19 | Adverse effects of water pollution on aquatic life | 4 | 4 | ------- |
| 20 | Aqua culture sampling | 4 | 2 | 2 |
| 21 | Sampls collection from fish farms (field study) | 4 | 2 | 2 |
| 22 | Soil pollution sources | 4 | 4 | ------- |
| 23 | Soil sampling | 4 | 2 | 2 |
| 24 | Soil pollution classification and hazards | 4 | 4 | ------- |
| 25 | Instrumentation used for soil assessments | 4 | 2 | 2 |
| 26 | Soil adsorption, bioaccumulation and degradation and erosion | 4 | 4 | ------- |
| 27 | analytical methods used for soil pollution assessments | 4 | 2 | 2 |
| 28 | Field study to show miss-use of pesticides | 4 | 2 | 2 |
| 29 | Pesticides Laws and Regulations | 4 | 4 | |
| 30 | Sources and types of radiation and dose calibrations | 4 | 2 | 2 |
| 31 | Mechanism of action ionizing radiation | 4 | 2 | 2 |
| 32 | Biological effects (early and delayed effects | 4 | 2 | 2 |
| 33 | Hazard effects of toxicants interaction | 4 | 4 | |
| 34 | Seminar and oral presentation | 4 | 2 | 2 |
| 35 | Practical Revision | 4 | | -4 |
| total | | 140 | 84 | 56 |

## 5-Teaching and learning methods

**5.1-** Lecture using PowerPoint presentations.

**5.2-** Learning through tutorials.

**5.3-** Independent reading throughout basic Text books and research papers.

## 6-Student assessment

**6.1. Assessments methods:**

| Method | Matrix alignment of the measured ILOs/ Assessments methods | | | |
|---|---|---|---|---|
| | K&U | I.S | P&P.S | G.S |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| Final Exam | a1-a2-a3-a4-a5-a8 | b1-b3 | C2- c4 –c5 | d2-d4 |
| Practical Exam | A6-a7-a8 | B2- b4 | c1- c3 | d1 |
| Oral Exam | a1-a2-a5-a8 | b1-b4-b3 | C2- c4-c3-c5 | d3 |

**6.2. Assessment schedules**

| Method | Week(s) |
|---|---|
| Practical exams | During the last month |
| Final exams | During the last month |
| Oral Exam | During the last month |

**6.3. Weight of assessments**

| Assessment | Weight of assessment |
|---|---|
| Practical exams | 25% |
| Final exams | 50 % |
| Oral Exam | 25 % |
| total | 100 % |

## 7- List of references

**7.1. Notes and books**

**Course Notes:** Prepared by departments' staff

- Notebook: Environmental Toxicology

**7.2. Essential books:**

- Environmental hazards: assessing risk and reducing disaster, by Keith Smith (2004)

- Principles and methods of toxicology, by Andrew Wallace Hayes (2007)

- Casarett and Doull's toxicology: the basic science of poisons, by Louis J. Casarett,Curtis D. Klaassen,John Doull (2008)

**7.3. Recommended texts**:

- Fundamentals of Air Pollution, Third Edition by Richard W. Boubel , Donald L. Fox ،Bruce Turner, Arthur C. Stern (2004)

- Chemical Principles of Environmental Pollution, B.J. Alloway and D.C. Ayres (1998)

- **Web Sites, … etc**

- Environmental pollution (http://www.sciencedirect.com/science/journal/02697491)

# Course Specification of Postgraduate

- United states of environmental agencies (http://www.epa.gov)

**Course Coordinators** **Head of Department**
Dr. Walaa A. Moselhy Prof. Dr. Khaled Abdou

# Course specification

Beni-Suef University
Faculty of Veterinary Medicine

# Course Specification of Postgraduate

## 1-Basic information

| | |
|---|---|
| **Course Code:** | Ph-152 |
| **Course title :** | **Clinical Toxicology** |
| **Program title:** | Toxicology and Forensic Medicine |
| **Contact hours/ week** | 4 hours/ week, (2 Lect./week, 2 Practical/week) |
| **Approval Date** | |

## 2-Professional information

**Overall aims of course**:

**This course aims to:**

This course prepares students to investigate and understand the effects of toxic agents on animal and human health as well as analytical methods for its monitoring. The main goal of the course is to build the competencies of the graduate medical student to manage cases of poisoning that will face them after graduation during the general medical practice, in addition to different studies on fish as biomarker for toxicosis.

**By completion of the course, students should have an understanding of:**

- Cite examples of practical importance of pharmacokinetics and pharmacogenetics in clinical toxicology.
- Identify and recognize cases of poisoning as regard the emergency stabilization, proper diagnosis and proper management.
- Consider the procedure of obtaining samples for toxicological analysis.
- Identify & Recognize common toxic plants in Egypt (Pharmacognosy).

## 3- Intended learning outcomes of course (ILOs)

**a- Knowledge and understanding:**

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

a1- Identify specific and crucial laboratory investigations and antidotal management of particular poisonings,

a2- Understand adverse effects, diagnosis and management of the most common poisonings.

A3- Realize examples of practical importance of pharmacokinetics and pharmacogenetics in clinical toxicology.

A4- Recognize the different animal venoms and mycotoxin poisoning and treatment.

A5-. Realize the toxicological methods for mutagencity and carcinogenicity studies

A6-Be able to collect suspected samples and detect the expected toxicants.

A7-. Emphasize the toxic effects and management of aqua culture toxicity.

A8-Recognize the different methods for diagnosis and treatment of poisoning

# Course Specification of Postgraduate

A9- Summarize the toxic effects of different industrial toxicants.

**b-Intellectual skills**

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

b1 Deal with cases of poisoning for proper diagnosis and proper management
b2- Utilize the advanced procedure of obtaining samples for toxicological analysis.
b3- Perform rapid simple tests that help diagnosis of the common poisons.
b4. Estimate the socio-economic for ideal poisoning treatment.

**C- Professional and practical skills**

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

C1- Consider patients with immediately life threatening conditions and select initial course of management for them.
C2 Perform advanced methods for toxicant Analysis (atomic absorption ,TLC,HPLC..)
C3- Predict factors that place individuals at risk for poisoning and select appropriate tests for detecting them at early stages.
C4- Communicate effectively, both orally and in writing, with animal owner and others with whom physician must exchange information.
C5- Retrieve (from electronic database and other resources), and utilize these information for solving problems and making decisions that are relevant to care of poisoned patient.
C6- Engage in life-long self directed learning to catch up the scientific evolution.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

d1. Work effectively as part of a team, demonstrating decision making and time management.
d2. Efficiently make use of library facilities and IT tools.
d3. Explore appropriate computer / keyboard skills including word processing, spreadsheets, presentation packages and graph plotting.
d4. Undertake written assignments and oral presentations.

**4-Topics and contents**

| Time/ Week | Topics | No. of hours | Credit Hours/week | |
|---|---|---|---|---|
| | | | T | P |
| 1 | Mutagenicity testing (a): Somatic mutation | 4 | 2 | 2 |
| 2 | Mutagenicity testing (b): Germinal mutation | 4 | 2 | 2 |
| 3 | Carcinogenicity testing | 4 | 2 | 2 |
| 4 | Tumor Markers | 4 | 2 | 2 |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| **5** | Assessment of gastrointestinal and pancreatic Toxicities | **4** | **2** | **2** |
| **6** | Assessment of cardiotoxicity | **4** | **2** | **2** |
| **7** | Fungicides detection | **4** | **2** | **2** |
| **8** | Mycotoxin detection | **4** | **2** | **2** |
| **9** | Analysis of ingredients in herbal Nnutritional s | **4** | **2** | **2** |
| **10** | Rodenticides part (a): Zinc phosphide, Anticoagulants | **4** | **2** | **2** |
| **11** | Rodenticides part (b): Fluoroacetic acid and its derivatives, thioureas (ANTU), | **4** | **2** | **2** |
| **12** | Hypersensitive measurement of proteins by capillary isoelectric focusing and liquid chromatography-Mass Sspectrometry | **4** | **2** | **2** |
| **13** | Measurements of catecholamines | **4** | **2** | **2** |
| **14** | Determination of amino acid neurotransmitters | **4** | **2** | **2** |
| **15** | Measurement of ALA synthase and dehydratase activity | **4** | **2** | **2** |
| **16** | Measurement of ALA synthase and dehydratase activity | **4** | **2** | **2** |
| **17** | Measurement of ferrochelatase activity | **4** | **2** | **2** |
| **18** | Toxic effects of solvents and vapors | **4** | **2** | **2** |
| **19** | Toxicity of animal venoms | **4** | **2** | **2** |
| **20** | Plant poisoning (a): General toxic effects on different organs and tissues | **4** | **2** | **2** |
| **21** | Plant poisoning (b): Some individual plants | **4** | **2** | **2** |
| **22** | Testing for Organophosphate-Induced Delayed Polyneuropathy | **4** | **2** | **2** |
| **23** | Hormone Assays (a): Pituitary and thyroid hormones | **4** | **2** | **2** |
| **24** | Hormone Assays (b): Corticosteroids | **4** | **2** | **2** |
| **25** | Hormone Assays (c): male & Female Sex Hormones | **4** | **2** | **2** |
| **26** | Stem cell in predictive toxicology | **4** | **2** | **2** |
| **27** | Toxic effects and diagnosis of feed additives | **4** | **2** | **2** |
| **28** | Toxic effects and diagnosis of bacterial toxins | **4** | **2** | **2** |
| **29** | Mycotoxicosis (a): Classification –aflatoxins, trichothecenes | **4** | **2** | **2** |
| **30** | Mycotoxicosis (b): Ochratoxins, citrinin , ergot, zearalenone, | **4** | **2** | **2** |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| **31** | Industrial toxicants (a): Polychlorinated biphenyls, polybrominated biphenyls | **4** | **2** | **2** |
| **32** | Industrial toxicant (b): polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans | **4** | **2** | **2** |
| **33** | Fish (a): General toxicity studies, Biomarkers for toxicosis, Reproductive toxicity studies, Hormonal disrupting studies | **4** | **2** | **2** |
| **34** | Fish toxicology (b): Toxic effects of metals, Toxic effects of pesticides | **4** | **2** | **2** |
| **35** | Seminar and oral presentation | **4** | **2** | **2** |
| **36** | Revision | **4** | **2** | **2** |
| **Total** | | **140** | **70** | **70** |

## 5-Teaching and learning methods

**5.1-** Lecture using PowerPoint presentations.

**5.2-** Learning through tutorials.

**5.3-** Independent reading throughout basic Text books and research papers.

## 6-Student assessment

**6.1. Assessments methods:**

| **Method** | Matrix alignment of the measured ILOs/ Assessments methods | | | |
|---|---|---|---|---|
| | **K&U** | **I.S** | **P&P.S** | **G.S** |
| Final Exam | **A2-a4-a7-a9** | **b1-b4** | **c1- c2-c3-c6** | **d2-d4** |
| Practical Exam | **A1-a3-a5-a6-a8** | **B2- b3** | **C2- c5-c4** | **d1** |
| Oral Exam | **A2-a4-a7-a8-a5** | **b1-b4-b3** | **c1- c6-c2-c3** | **d3** |

**6.2. Assessment schedules**

| **Method** | **Week(s)** |
|---|---|
| Practical exams | **according to faculty exam schedule** |
| Final exams | **according to faculty exam schedule** |
| Oral Exam | **according to faculty exam schedule** |

**6.3. Weight of assessments**

| Assessment | Weight of assessment |
|---|---|
| Practical exams | 25% |
| Final exams | 50 % |
| Oral Exam | 25 % |

# Course Specification of Postgraduate

| | |
|---|---|
| total | 100 % |

## 7- List of references

### 7.1. Notes and books

**Course Notes:** Prepared by departments' staff

- Notebook: - Clinical Toxicology

### 7.2. Essential books:

- Veterinary Forensics: Animal Cruelty Investigation. Merck, M.D., Wiley-Blackwell, USA, 2007.
- Introduction to Veterinary and Comparative Forensic Medicine. Cooper, J.E. and Cooper, M.E., Wiley-Blackwell, USA, 2007.
- Animal Abuse and Unlawful Killing: Forensic veterinary pathology. Munro, R. and Munro, H.M.C., Saunders Ltd, China, 2008.

### 7.3. Recommended texts:

- Nonhuman DNA Typing: Theory and Casework Applications (Forensic Science Series). Coyle, H.M., CRC Press, Boca Raton, 2007.
- Forensic Entomology. The Utility of Arthropods in Legal Investigations. Byrd, J.H. and Castner, J.L., CRC Press, Boca Raton, 2009.
- Color Atlas of Forensic Medicine and Pathology. Catanese, C.A., CRC Press, Boca Raton, 2010.
- **Web Sites, … etc**

- *Toxicol. Appl. Pharmacol.*
- *Toxicol. In vitro.*
- http://www.toxicology.org/
- http://www.ivis.org/advances/Beasley/
- http://www.sciencedirect.com/

**Course Coordinators**
Dr. Walaa A. Moselhy

**Head of Department**
Prof. Dr. Khaled Abdou

# Course specification

Beni-Suef University
Faculty of Veterinary Medicine

# Course Specification of Postgraduate

## 1-Basic information

| | |
|---|---|
| **Course Code:** | Ph-151 |
| **Course title :** | Forensic Toxicology |
| **Program title:** | Toxicology and Forensic Medicine |
| **Contact hours/ week** | 4 hours/ week, (2 Lect./week, 2 Practical/week) |
| **Approval Date** | |

## 2-Professional information

**Overall aims of course**:

**This course aims to:**

- Collecting, management and identification of different biological samples.
- Measurement of drugs and other toxic substances in the biological specimens along with the interpretation of the results in medico-legal contexts.
- Detection of drugs and other toxic substances present in the biological first by an initial screening and then a further confirmation of the right compound and the quantification of the compound by using different analytical methods.
- Writing toxicology reports.

**By completion of the course, students should be able to:**

- Equipmentation of forensic toxicology laboratories.
- Using different methods and techniques for analysis.
- Interpretation of obtained results of analysis.
- Writing a toxicological report.
- Mange the biological samples.
- Screening and confirm toxic substances in biological samples either qualitatively and quantitatively.

## 3- Intended learning outcomes of course (ILOs)

### a- Knowledge and understanding:

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

$a_1$- Recognize advanced methods of; samples collection, identification, preservation and management.

$a_2$Realize using different advanced apparatuses ,new techniques and modern methods used in forensic toxicology laboratory.

$a_3$- Recognize how to interpret ate the obtained results.

$a_4$- trained to write toxicological reports.

### b-Intellectual skills

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

$b_1$- Deal with the different instruments and glass ware of the laboratory and safety.

$b_2$- Handling, labeling, preservation and management of samples.

$b_3$- detecting toxic materials in different samples qualitatively and quantitatively.

# Course Specification of Postgraduate

$b_4$- Interperitate the obtained analysis data.
$b_5$- Writing toxicological report.

**C- Professional and practical skills**

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

$c_1$- Flow the guidelines of safety.
$c_2$- Manipulation, identification and preservation of samples.
$c_3$- Perform different types of equipments.
$c_4$- Perform different methods of analysis
$c_5$- Interpretation of the results of analysis
$c_6$- Writing toxicological reports.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

$d_1$-work as a part of a team in effective manner, demonstrating decision making and time management.
$d_2$- Use of library facilities and its tools.
$d_3$- Use of computers and its programmes specially word, excel sheet and plotting graphs.
$d_4$- Undertake written assignments and oral presentation.

## 4-Topics and contents

| Time / week | Topics | No. of hours | Credit Hours | |
|---|---|---|---|---|
| | | | T | P |
| 1 | Overview and safety | 4 | 4 | -- |
| 2 | manipulation and preservation of samples | 4 | 2 | 2 |
| 3-5 | Equepmentation of forensic toxicology laboratory | 9 | 6 | 3 |
| 6-8 | New methods Qualitative detection of narcotics | 9 | 6 | 3 |
| 9-11 | Quantitative analysis of narcotics | 9 | 6 | 3 |
| 12 | Interpretation of analysis | 4 | 2 | 2 |
| 13 | Reporting | 4 | 2 | 2 |
| 14-16 | Qualitative detection of metalloids | 9 | 6 | 3 |
| 16-19 | Advanced methods for Quantitative analysis of metalloids | 9 | 6 | 3 |
| 20 | Interpretation of analysis | 4 | 2 | 2 |
| 21 | Reporting | 4 | 2 | 2 |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| 22-24 | Qualitative detection of pesticides | 9 | 6 | 3 |
| 25-26 | Quantitative analysis of pesticides (advanced methods) | 9 | 6 | 3 |
| 27 | Interpretation of analysis | 4 | 2 | 2 |
| 28 | Reporting | 6 | 4 | 2 |
| 29-30 | Qualitative analysis of plants active principals | 9 | 6 | 3 |
| 31-32 | Quantitative analysis of plants active principals | 9 | 6 | 3 |
| 33 | Interpretation of analysis | 4 | 2 | 2 |
| 34 | Seminar and oral presentation | 4 | 2 | 2 |
| 35 | Revision | 4 | 2 | |
| Total | | 127 | 82 | 45 |

## 5-Teaching and learning methods

**5.1-** Lecture using PowerPoint presentations.

**5.2-** Learning through tutorials.

**5.3-** Independent reading throughout basic Text books and research papers.

## 6-Student assessment

**6.1. Assessments methods:**

| Method | Matrix alignment of the measured ILOs/ Assessments methods | | | |
|---|---|---|---|---|
| | **K&U** | **I.S** | **P&P.S** | **G.S** |
| Final Exam | A3-a4 | B4-b5 | C1-c5-c6 | d2-d4 |
| Practical Exam | A1-a2 | B1-b2-b3 | C2-c3-c4 | d1 |
| Oral Exam | A3-a4-a2 | B4-b5-b3 | C1-c6-c3-c4 | d3-d5 |

**6.2. Assessment schedules**

| Method | Week(s) |
|---|---|
| Practical exams | During the last month |
| Final exams | During the last month |

# Course Specification of Postgraduate

| | |
|---|---|
| Oral Exam | During the last month |

**6.3. Weight of assessments**

| Assessment | Weight of assessment |
|---|---|
| Practical exams | 25% |
| Final exams | 50 % |
| Oral Exam | 25 % |
| total | 100 % |

## 7- List of references

**7.1. Notes and books**

**Course Notes:** Prepared by departments' staff

- Notebook: -Forensic Toxicology Note

**7.2. Essential books:**

- Principles of Forensic Toxicology: Barry Levine, Taylor and Francis, Philadelphia, 2009
- Principles of Forensic Toxicology: Paperback, Barry Leume and Barry Levine, Logman group limited, London, 2008

**7.3. Recommended texts**:

- - Handbook of Forensic Toxicology for Medical Examiners: D. K. Molina, Johan Wiley & sons, Inc., Sydney 2007
- - Progress of Capillary Electrophoresis in Therapeutic Drug Monitoring and Clinical and Forensic Toxicology: Thormann, Wolfgang, Blackwell Scienti c Publications, Oxford, 2009
- - Drug Testing in Alternate Biological Specimens: Amanda J. Jenkins, Churchill Livingstone, London, 2007
- - Clarke's Analytical Forensic Toxicology: Sue Jickells and Adam Negrusz, University of Illinois, Chicago, USA, 2009
- **Web Sites, … etc**

-The international association of forensic toxicology
http://www.tiaft.org

**Course Coordinators**
Dr. Walaa A. Moselhy

**Head of Department**
Prof. Dr. Khaled Abdou

Beni Suef University
Faculty of Veterinary Medicine

# Course specification

| | Topics | week | Intended learning outcomes of course (ILOs) | | | |
|---|---|---|---|---|---|---|
| | | | K and U (a) | I.S (b) | P. P.S. (c) | G.T.S (d) |
| 1 | Overview and safety | 1 | 1 | 1 | 1,2 | 1 |
| 2 | Identification, manipulation and preservation of samples | 2 | 2 | 1,2 | 2 | 2 |
| 3 | Equepmentation of forensic toxicology laboratory | 3 | 2,3 | 1,2 | 2 | 2 |
| 4 | Qualitative detection of narcotics | 4 | 3 | 1 | 2,3 | 1,2 |
| 5 | Quantitative analysis of narcotics | 5 | 3 | 4 | 2,5 | 3,4 |
| 6 | Interpretation of analysis | 6 | 2 | 1 | 2 | 1 |
| 7 | Reporting | 7 | 2 | 1 | 1,2 | 2 |
| 8 | Qualitative detection of metalloids | 8 | 2,3 | 1,2 | 2,6 | 3 |
| 9 | Quantitative analysis of metalloids | 9 | 3 | 1,2 | 1,2 | 2 |
| 10 | Interpretation of analysis | 10 | 3 | 3,4 | 2 | 1 |
| 11 | Reporting | 11 | 2 | 1,2 | 1,2 | 1 |
| 12 | Qualitative detection of pesticides | 12 | 2,3 | 1,2 | 1,2 | 1 |
| 13 | Quantitative analysis of pesticides | 13 | 2 | 3 | 2 | 2,4 |
| 14 | Interpretation of analysis | 14 | 3 | 1,2 | 4 | 1 |
| 15 | Reporting | 15 | 3 | 2 | 2 | 1,3 |
| 16 | Qualitative analysis of plants active principals | 16 | 4 | 3,4 | 5 | 4 |
| 17 | Quantitative analysis of plants active principals | 17 | 3,4 | 2 | 3 | |
| 18 | Interpretation of analysis | 18 | 24 | 1,4 | 2 | 2 |
| 19 | Overview and safety | 19 | 3 | 3 | 6 | 3 |
| 20 | Identification, manipulation and preservation of | 20 | 4 | 3 | 3,5 | 2,4 |

# Course specification

| | | | | | | |
|---|---|---|---|---|---|---|
| | samples | | | | | |
| 21 | Equepmentation of forensic toxicology laboratory | 21 | 1 | 2 | 6 | 1,3 |
| 22 | Qualitative detection of narcotics | 22 | 4 | 5 | 2 | 2,4 |
| 23 | Quantitative analysis of narcotics | 23 | 2 | 3,4 | 1 | 3 |
| 24 | Interpretation of analysis | 24 | 3 | 1,3 | 5 | 1 |
| 25 | Reporting | 25 | 3,4 | 2 | 3 | 3 |
| 26 | Qualitative detection of metalloids | 26 | 3 | 4 | 4 | 4 |
| 27 | Quantitative analysis of metalloids | 27 | 4 | 3 | 4 | 2,4 |
| 28 | Interpretation of analysis | 28 | 3 | 1 | 2 | 3 |
| 29 | Reporting | 29 | 4 | 3 | 1,5 | 2 |
| 30 | Qualitative detection of pesticides | 30 | 1,3 | 2 | 3,6 | 1 |
| 31 | Quantitative analysis of pesticides | 31 | 4 | 3 | 2,3 | 3 |
| 32 | Interpretation of analysis | 32 | 2 | 2 | 4,5 | 4 |
| 33 | Reporting | 33 | 1 | 3 | 2,3 | 2 |
| 34 | Qualitative analysis of plants active principals | 34 | 3 | 1 | 5 | 4 |
| 35 | Quantitative analysis of plants active principals | 35 | 3 | 5 | 3,3 | 1,2 |

Beni-Suef University
Faculty of Veterinary Medicine

# Course Specification of Postgraduate

## 1-Basic information

| | |
|---|---|
| **Course Code:** | Ph-148 |
| **Course title :** | Forensic medicine |
| **Program title:** | Toxicology and Forensic Medicine (PhD) |
| **Contact hours/ week** | 3 hours/ week, (2 Lect./week, 1 Practical/week) |
| **Approval Date** | |

## 2-Professional information

**Overall aims of course**:

**This course aims to:**

- A PhD degree in forensic medicine can provide a career jump for many professionals, including those in the medical and criminal justice fields

**By completion of the course, students should be able to:**

- Acquaint with various Medicolegal problems in civil and criminal cases.
- Identify living & dead bodies, blood and semen stain (by chemical & serological tests).
- Acquaint with the postmortem examinations (Autopsy) and to write a medicolegal report.
- Acquaint with the histopathological examination of any suspicious tissue to identify the cause of death.
- Acquaint with forgery and falsification.

## 3- Intended learning outcomes of course (ILOs)

### a- Knowledge and understanding:

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

a1- Describe and analyzes medical facts in civil or criminal cases
a2- Describe common hypothesis of medicolegal aspects in different causes of death
a3- Identify the different forensic branches , anthropology, odontology, entomology…..
a4- Describe the science behind physical evidence, including: Hair and fibers, Fingerprints and physical matching, Blood spatter, Serology and DNA ,Ballistics and firearms ,Paint and road traffic accident evidence ,Narcotics ,Clandestine graves.

a5- Identify ill legal usage of doping agents
a6- Define the animal abuse .
a7- identify different methods of animal euthanasia .
a8- Identify the Necropsy protocols.
A9- **Forensic investigation of explosions (histopathological and biochemical analysis)**

### b-Intellectual skills

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

b1- Differentiate between natural ,homicidal suicidal and accedental death.

# Course Specification of Postgraduate

b2- Advanced methods for collect, analyze and document evidence in a forensic case.
b3- Differentiate between suicidal, accidental or homicidal injuries
b4- Diagnose different types of **Ballistic imagining techniques**
b5- detect the different **Quantitative PCR in forensic science**
**b6- Advanced methods for Gunshot residue chemical analysis**

**C- Professional and practical skills**

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

c1- Write a medico-legal report in English and Arabic..
c2- Apply methods for identification of **Animal cruelty**
c3- Recognize different forensic samples (hair fibers & blood).
c4- Perform ideal **DNA extraction techniques for Forensic Analysis**
c5- Recognize advanced methods for meat adulteration detection .
c6- Interpret the data obtained from the forensic lab.

**d- General and transferable skills**

**By the end of studying the course, the student should be able to:**

d1. Work effectively as part of a team, demonstrating decision making and time management.
d2. Efficiently make use of library facilities and IT tools.
d3. Explore appropriate computer / keyboard skills including word processing, spreadsheets, presentation packages and graph plotting.
d4. Undertake written assignments and oral presentations.

**4-Topics and contents**

| Time/ Week | Topics | No. of hours | Credit Hours/week | |
|---|---|---|---|---|
| | | | T | P |
| 1 | **Writing of medico-legal report** | 3 | 3 | ------- |
| 2 | **Animal cruelty (abuse)** | 3 | 3 | |
| 3 | **Crime scene investigation** | 3 | 3 | ------- |
| 4 | **Forensic animal hair examination** | 3 | 2 | 1 |
| 5 | **Fibers as a forensic evidence** | 3 | 2 | 1 |
| 6 | **Death certification** | 3 | 3 | - |
| 7 | **Detection of meat adulteration** | 3 | 2 | 1 |
| 8 | **Forensic entomology: Collection of entomological evidence** | 3 | 3 | 1 |
| 9 | **Autopsy :External and internalexamination** | 3 | 2 | 1 |

# Course Specification of Postgraduate

| | | | | |
|---|---|---|---|---|
| 10 | Forensic entomology: Estimating the postmortem interval | 3 | 2 | 1 |
| 11 | Autopsy :Individual organ examination | 3 | 2 | 1 |
| 12 | Entomological alteration of bloodstain evidence | 3 | 2 | 1 |
| 13 | Death due to natural diseases | 3 | 2 | 1 |
| 14 | sudden death: Infectious diseases | 3 | 2 | 1 |
| 15 | Sudden death: Chemical causes | 3 | 2 | 1 |
| 16 | Laboratory determination of time since death | 3 | 2 | 1 |
| 17 | Laboratory examination of entomological evidence | 3 | 2 | 1 |
| 18 | Trace evidence in forensic laboratory | 3 | 2 | 1 |
| 19 | Forensic examination of other body fluids (urine, feces, vomitus, etc.) | 3 | 2 | 1 |
| 20 | Forensic significance of digital images | 3 | 2 | 1 |
| 21 | Forensic investigation of explosions | 3 | 2 | 1 |
| 22 | Ballistic imagining techniques | 3 | 2 | 1 |
| 23 | DNA extraction techniques for Forensic Analysis | 3 | 2 | 1 |
| 24 | Quantitative PCR in forensic science | 3 | 2 | 1 |
| 25 | DNA testing of animal evidence | 3 | 2 | 1 |
| 26 | Forensic canine STR analysis | 3 | 2 | 1 |
| 27 | Forensic significance of DNA typing | 3 | 2 | 1 |
| 28 | Forensic feline STR analysis | 3 | 2 | 1 |
| 29 | Protein Profiling for Forensic applications | 3 | 2 | 1 |
| 30 | Fetal and perinatal death | 3 | 2 | 1 |
| 31 | Doping agent | 3 | 2 | 1 |
| 32 | Animal euthanasia | 3 | 3 | - |
| 33 | Histopathological and Biochemical analysis of forensic evidence | 3 | 2 | 1 |
| 34 | Seminar and oral presentation | 3 | | 3 |
| 35 | Practical Revision | 3 | | -3 |
| Total | | 108 | 72 | 36 |

## 5-Teaching and learning methods

**5.1-** Lecture using PowerPoint presentations.

# Course Specification of Postgraduate

**5.2-** Learning through tutorials.

**5.3-** Independent reading throughout basic Text books and research papers.

**5.4-** small group discussion

## 6-Student assessment

**6.1. Assessments methods:**

| Method | Matrix alignment of the measured ILOs/ Assessments methods | | | |
|---|---|---|---|---|
| | **K&U** | **I.S** | **P&P.S** | **G.S** |
| Final Exam | a1-a8 | b1-b5 | c1- c5 | d2-d4 |
| Practical Exam | a1,a4, a5, a7 | b1- b5 | c1- c5 | d1 |
| Oral Exam | a1-a8 | b1-b4 | c1- c5 | d3 |

**6.2. Assessment schedules**

| Method | Week(s) |
|---|---|
| Practical exams | according to faculty exam schedule |
| Final exams | according to faculty exam schedule |
| Oral Exam | according to faculty exam schedule |

**6.3. Weight of assessments**

| Assessment | Weight of assessment |
|---|---|
| Practical exams | 25% |
| Final exams | 50 % |
| Oral Exam | 25 % |
| total | 100 % |

## 7- List of references

**7.1. Notes and books**

**Course Notes:** Prepared by departments' staff

- Notebook: Forensic Medicine

**7.2. Essential books:**

- **Fundamental of Analytical Toxicology.** Flanagan, R.J., Taylor, A., Watson, I.D. and Whelpton, R., John Wiley & Sons Ltd, England, 2007.
- **Clarke's Analysis of Drugs and Poisons.** Moffat,A.C., Osselton, M.D., Widdop, B., and Galichet, L.W., 3rd ed, Pharmaceutical Press., London, 2005.

**`7.3. Recommended texts**:

- **Forensic Chemistry.** Bell, S., 1st ed., Prentice Hall, New Jersy, 2006.
- **Handbook of Forensic Drug Analysis.** Smith, F. and Siegel, J.A., Elsevier Academic Press, USA, 2005.
- **Handbook of Forensic Toxicology for medical Examiners**. Molina, D.K., CRC Press, Boca Raton, 2010.

- **Web Sites, … etc**

# Course Specification of Postgraduate

- http://www.ivis.org/advances/Beasley/
- http://www.sciencedirect.com/

**Course Coordinators**
Dr. Walaa A. Moselhy

**Head of Department**
Prof. Dr. Khaled Ab