

Program specification for Doctorate Degree in Parasitology

Code: 1707800

University: Alexandria

Faculty: Medical Research Institute

Program Specification

A- Basic information

1- Program title: Doctorate of Philosophy in Applied and Molecular Parasitology

2- Program type: single double multiple

3- Department(s) :

4- Coordinator : Ass. Prof Dr. Mona Tolba

5- External evaluator(s): Prof Dr: Sherif Abaza, prof. of Parasitology, Faculty of Medicine, Suez canal University

6- Last date of program specification approval: 5/6/2014

B- Professional Information

1- Program aims to:

- Equip the students with scientific knowledge through research and reasoning, the student should be competent in basic practical and advanced procedures.
- Guide students to the proper management of difficult professional problems and have clinical skills to recognize, diagnose and manage many parasitological diseases adequately.
- Help students to be proficient in conducting research.
- Improve procedures using technology and innovation

By the end of the program the students should be able to:

- 1-List and recognize the advanced knowledge about different parasitic diseases.
- 2-Describe the importance of advanced diagnostic techniques in the recognition of different parasites.
- 3-Describe the knowledge about molecular biology and identify its important role in diagnosis and recognition of different parasites.

- 4-Relate host parasite relationship as an essential part in the study of parasitic diseases.
- 5-List the basic concepts of immunology in parasitic disorders and discuss the regulation and disordered functions of the immune system.
- 6- Interpret and understand the importance of cultural methods as good tools in investigation of various aspects in parasitology.
- 7-Demonstrate pathology and pathogenesis of different parasitic diseases.
- 8-Describe different anti-parasitic drug groups and recall their mechanism of action in the treatment of parasitic infections.
- 9-Recognize importance of quality control; review its tools and its application in diagnosis of parasitic diseases.
- 10-Recognize and assess prevention and control of different parasitic infections.
- 11- List different types of zoonotic diseases that infect human and identify the different methods of their prevention and control.
- 12-Interpret surveillance data about different parasites and its application to decrease parasite load in the environment and affect incidence of parasitic diseases.
- 13-Use systematic approach to design and conduct scientific research
- 14-Conduct research studied add to the existing specialty knowledge.

2- Intended learning outcomes (ILOS)

a- knowledge and understanding:

- a1-** Identify morphological features ,different hosts, life cycle, mode of transmission of helminths and protozoa and understand host- parasite relationships.
- a2-** List arthropods and snails of medical importance and explain their roles as causative agents and vectors of some parasitic diseases. Recognize and solve the problems of zoonotic parasitic diseases.
- a3 -** Recognize the importance of field study and parasitological laboratory techniques in samples collection, preparation, transportation and instrumentation.
- a4-** Recognize the principals of molecular biology and discuss its applications in diagnosis, species identification and preparation of important parasitic antigens .
- a5-** Describe the pathogenesis and clinical picture of different parasitic infections.
- a6-** Recall the immunological defense mechanisms against a different groups of parasites. Describe different immune responses against helminthic and protozoal parasitic infections
- a7-** Design ,conduct and publish scientific research. Describe the ethical considerations in different types of scientific research.

- a8-** Recall the mutual relation between professional practice and effects on the environment.
- a9-** Recognize the recent advances in the field of diagnostic medical parasitology and the details of ethical and legal practice.
- a10-** Review information about snail taxonomy and anatomy. Identify different stages of parasite infecting the snail and applications of different methods of snail control.
- a11-** Define methods for prevention and control of parasite transmission between animal and human and understand reasons for their success or failure.
- a12-** Define different types of experimental animals used for parasitic infections and recognition of biology, biochemistry and pathology of parasites inside the animals.
- a13-** Describe different cultural methods and different types of media used as tools of research and diagnosis for various parasitic diseases.
- a14-** Define role of history taking and clinical examination for exact management of parasitic diseases. Review impact of parasites in the etiology of system-oriented tropical diseases. Review health implications of parasitic diseases which should receive attention especially in our country.

b- Intellectual skills:

- b1-** Interpret and analyze the impact of parasitic infections in tropical diseases, their effect on different body systems, pathogenic mechanisms, different diagnostic methods and evaluate information to solve these problems.
- b2-** Evaluate the values of different parasitological laboratory techniques and analyze the results, apply quality control measures and add to the specialty through creativity and innovation.
- b3-** Apply the basic concepts of molecular parasitology and its role in diagnosis of light infections, antigen preparations and species identification.
- b4-** Interpret the results of serological and coprological techniques and relate them to clinical findings.
- b5-** Compare the signs and symptoms and interpret host parasite relationship of different parasitic diseases.
- b6-** Solve problems in the management of parasitic infections. Take decisions in various professional situations on the basis of evidence and proofs.
- b7-** Interpret drug-drug interactions in parasitological chemotherapy.
- b8-** Discuss the role of experimental animals and in vitro cultivation in the study of new therapeutics.
- b9-** Design protocols for infection of different snail vectors in the laboratory with parasites and illustrate the role of snail control in eradication of parasitic infections.
- b10-** Compare different immunological response to different protozoan and helminth parasites and demonstrate the interaction of parasites with the humans and its impact on pathology of the disease.

b11- Analyze factors affecting transmission of parasitic infections in the community level and select appropriate methods for prevention and control of parasitic diseases.

b12- Compare and select different anti-parasitic drugs based on mechanism of action, efficacy to calculate dosage and relate patients response to therapy.

b13- Write a thesis protocol using a scientific systematic approach to a research problem.

b14- Prepare scientific articles/papers to be published in the indexed journals.

c- professional and practical skills:

c1- Apply different diagnostic laboratory techniques (iodine smears, concentration, staining). Apply basic and advanced professional skills through proper stool, urine and blood sample collections, transportation and preparation.

c2- Develop skills in preparing and using different stains. Perform different parasitological tests and improve methods and tools used.

c3- Design different surveys to study and control different parasitic diseases.

c4- Gain experience to solve epidemiological problems related to parasitic diseases.

c5- Identify different snails transmitting various parasites and applying snail surveys for controlling parasitic infections.

c6- Perform different immunological techniques for better diagnosis of various parasitic infections.

c7- Perform proper clinical examination and history taking. Design treatment plans for cases infected with more than one parasite.

c8- Prepare experimental animals for breeding, infection and develop experience in their care.

c9- Perform different molecular techniques (conventional PCR, real time PCR) and interpretation of various findings.

d- General and transferable skills:

d1- Develop skills in self appraisal and seek continuous learning.

d2- Develop team work skills ,work as team leader as well as a member in larger teams.

d3- Use information technology to improve professional practice and use different sources of information to obtain data.

d4- Develop skills in communication using all methods. Manage scientific meeting.

3- Academic standards

3a External references for standards (Benchmarks)

Generic Academic Reference Standards of the National Authority for Quality Assurance and Accreditation of Education (NAQAAE) adopted at MRI council 12/2/2014 and re-adopted at 15/1/2023

Last date of Academic Reference standards (ARS) approval by Institute Council: 15/1/2023

3b Comparison of provision to selected external references:

Generic Academic Standards	ARS of PhD of Parasitology
A1-Basic facts , theories, of the specialty and related subjects/ fields	<p>a1- Identify morphological features, different hosts, life cycle, mode of transmission of helminthes and protozoa , list arthropods and snails of medical importance, review information about snail taxonomy and anatomy and recognize and solve the problems of zoonotic parasitic diseases.</p> <p>a2 - Recognize the importance of field study and parasitological laboratory techniques in samples collection, preparation, transportation and instrumentation.</p> <p>a3- Describe the pathogenesis and clinical picture of different parasitic infections and define methods for prevention and control of parasite transmission and define role of history taking and clinical examination for exact management of parasitic diseases.</p> <p>a4- Recall the immunological defense mechanisms against different groups of parasites. Describe different immune responses against helminthic and protozoal parasitic infections</p> <p>a7- Define different types of experimental animals used for parasitic infections and describe different cultural methods and different types of media used as tools of research and diagnosis for various parasitic diseases.</p>
A2- Mutual relation between professional practice and effects on environment	<p>a3- Describe the pathogenesis and clinical picture of different parasitic infections and define methods for prevention and control of parasite transmission and define role of history taking and clinical examination for exact management of parasitic diseases.</p> <p>a8- Recognise the impact of adequate diagnosis of parasites causing tropical diseases and recall the mutual relation between professional practice and effects on the environment.</p>
A3- Recent advances in the field of practice	a6- Recognize the recent advances in the field of diagnostic medical parasitology and the details of ethical and legal practice and recognize the principals of molecular biology .
A4- Details of ethical & legal practice	a5- Design ,conduct and publish scientific research. Describe the ethical considerations in different types of scientific research.
A5 -Quality standards of the practice	a8- Recognise the impact of adequate diagnosis of parasites causing tropical diseases and recall the mutual relation between professional practice and effects on the environment.
A6- Design, conduction & publishing of scientific	a5- Design, conduct and publish scientific research through different thesis and innovative studies. Consider the ethical aspects in different

research	types of scientific research.
A7- Ethical considerations in different types of scientific research	a5- Design, conduct and publish scientific research through different thesis and innovative studies. Consider the ethical aspects in different types of scientific research.
B1 - Analyze, deduce, extrapolate & evaluation of information	b1- Interpret and analyze the impact of parasitic infections in tropical diseases and analyze factors affecting transmission of parasitic infections in the community level and select appropriate methods for prevention and control of parasitic diseases. b3- Interpret the results of serological and coprological techniques and relate them to clinical findings and apply the basic concepts of molecular Parasitology. b6- Compare different immunological response to different protozoan and helminth parasites and demonstrate the interaction of parasites with the humans and its impact on pathology of the disease.
B2- Solve the majority of problems in the specialty according to the available data (complete or incomplete)	b2- Evaluate the values of different parasitological laboratory techniques and analyze the results, apply quality control measures and add to the specialty through creativity and innovation. b3- Interpret the results of serological and coprological techniques and relate them to clinical findings and apply the basic concepts of molecular Parasitology. b4- Compare the signs and symptoms, interpret host parasite relationship of different parasitic diseases and solve problems in the management of parasitic infections. b6- Compare different immunological response to different protozoan and helminth parasites and demonstrate the interaction of parasites with the humans and its impact on pathology of the disease. b7- Compare and select different anti-parasitic drugs and interpret drug-drug interactions in parasitological chemotherapy. Discuss the role of experimental animals and in vitro cultivation in the study of new therapeutics
B3- Conduct research studies that add to the existing specialty knowledge	b5- Conduct research studies that add to the existing specialty knowledge, publish scientific articles/papers in indexed journals and design protocols.
B4- Publish scientific articles/papers (in indexed journals)	b5- Conduct research studies that add to the existing specialty knowledge. Publish scientific articles/papers in indexed journals and design protocols.
B5- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice	b4- Compare the signs and symptoms, interpret host parasite relationship of different parasitic diseases and solve problems in the management of parasitic infections. b5- Conduct research studies that add to the existing specialty knowledge. Publish scientific articles/papers in indexed journals and design protocols
B6- Take decisions in various professional situations (including dilemmas & controversial issues)	b1- Interpret and analyze the impact of parasitic infections in tropical diseases and analyze factors affecting transmission of parasitic infections in the community level and select appropriate methods for prevention and control of parasitic diseases. b7- Compare and select different anti-parasitic drugs and interpret drug-drug interactions in parasitological chemotherapy. Discuss the role of

	experimental animals and in vitro cultivation in the study of new therapeutics
B7- Add to the specialty field through creativity & innovation.	b8- Add to the specialty field through thesis & innovation studies.
B8-Manage discussions on basis of evidence and proofs	b4- Discuss and compare the signs and symptoms, interpret host parasite relationship of different parasitic diseases and solve problems in the management of parasitic infections.
C1- Competent in all basic and all required advanced professional skills (to be determined according to the specialty board/ department)	c1- Apply different diagnostic laboratory techniques. Apply basic and advanced professional skills through proper stool, urine and blood sample collections, transportation and preparation. c3- Prepare lists of snails transmitting various parasites, apply snail surveys for controlling parasitic infections and prepare experimental animals for breeding, infection and develop experience in their care. c4- Perform different immunological techniques, different molecular techniques (conventional PCR, real time PCR) and interpretation of various findings. c5- Perform proper clinical examination and history taking. Design treatment plans for cases infected with more than one parasite.
C2- Write and appraise reports	c3- Prepare lists of snails transmitting various parasites, apply snail surveys for controlling parasitic infections and prepare experimental animals for breeding, infection and develop experience in their care. c5- Perform proper clinical examination and history taking. Design treatment plans for cases infected with more than one parasite.
C3-Evaluate and improve methods and tools used in specialty	c1- Apply different diagnostic laboratory techniques. Apply basic and advanced professional skills through proper stool, urine and blood sample collections, transportation and preparation. c4- Perform different immunological techniques, different molecular techniques (conventional PCR, real time PCR) and interpretation of various findings.
C4- Use technology to advance practice	c4- Perform different immunological techniques, different molecular techniques (conventional PCR, real time PCR) and interpretation of various findings.
C5- Plan professional development courses to improve practice and enhance performance of juniors	c2- Design different surveys to study and control different parasitic diseases and gain experience to solve epidemiological problems related to parasitic diseases. c5- Perform proper clinical examination and history taking. Design treatment plans for cases infected with more than one parasite.
D1- Communicate effectively using all methods	d2- Develop team work skills ,work as team leader as well as a member in larger teams. d4- Develop skills in communication for teaching and evaluation of others. Manage scientific meeting.
D2- Use information technology to improve his/her professional practice	d3- Use information technology to improve professional practice and use different sources of information to obtain data.
D3- Teach and evaluate others	d4- Develop skills in communication for teaching and evaluation of others. Manage scientific meeting.

5- Program Courses

5.1- Compulsory (17 Credit Hours)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1707801	Advanced parasitology I	3	2	2
1707802	Advanced parasitology II	3	2	2
1707803	Zoonosis	2	2	-
1707804	Host-Parasite Relationship	2	2	-
1707805	Field Studies	2	1	2
1707806	Quality Control	1	1	-
1707813	Advanced Molecular Parasitology	2	1	2
1705814	Prevention and Control of parasitic Diseases	2	2	-
Total		17	13	10

5.2- Elective I (7 Credit Hours)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1707808	Advanced Clinical Parasitology I	2	1	2
1707809	Advanced Clinical Parasitology II	1	1	-
1707810	Treatment of parasitic infections	1	1	-
1707811	Advanced Experimental Parasitology	3	2	2
1707812	In Vitro Cultivation	2	1	2
1707807	Malacology	3	2	2
1721821	Computer	3	2	2
1701821	Biochemistry	3	2	2
1704820	Pharmacology	3	2	2
1705820	Hematology	3	2	2
1708820	Immunology	3	2	2
1710820	Pathology	3	2	2
1706820	Bacteriology	3	2	2

5.3- Elective II – (none)

5.4- Optional – (none)

6- Program admission requirements

- The student applying for doctorate degree should have had a master degree with at least a grade of C or an equivalent degree in Parasitology, Biochemistry, Public Health.

Teaching hours for the program

- In order to be granted the doctorate degree in various fields, the student must fulfill and pass the specified number of credit hours for each degree.
- The student can select a number of courses from within other optional courses at the Medical Research Institute or from other faculties within the University of Alexandria or other universities.

7-Teaching and Learning Methods

Lecture, Practical/Clinical, Brainstorming, Discussion Groups, Problem Solving, Case Study, Field Training, Training Workshops, Self-Directed Learning

8-- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of PhD, the student must:

- 1- Complete **24** credit hours with CGPA of at least C+ through courses .
- 2- Complete 24 credit hours with through thesis.
- 3- Submit a thesis validity report by an examination committee approved by the department council and their members include at least two external examiners.

9- Evaluation of Students enrolled in the program.

Tool evaluation	Intended learning outcomes being assessed
Written	ILOs a &b
Practical	ILOs c
Oral	ILOs a ,b &d
Semester Work	ILOs b & d

Evaluation of the Program

Evaluator	Tool	Sample
1- Senior students	questionnaire	At least 50 %
2- Alumni	questionnaire	Representative sample
3- Stakeholders (Employers)	meeting	Representative sample
4- External Evaluator(S) or External Examiner (s)	Report	Prof.Dr. Sherif Abaza
5- Other		

***Program coordinator :**Name: **Prof. Dr : Mona Tolba**

Signature :


***Department Head:**Name: **Prof.Dr: Hend Eltaweel**

Signature:

Date of Department Council Approval:**28/8/2023**


***Generic Attributes * Program Attributes * Program Aims Matrix**

Generic Graduate Attributes of NAQAAE	Graduate Attributes of Doctor of Philosophy in <i>Applied and Molecular Parasitology</i>	Program Aims
	By the end of this program, Graduate of Doctor of Philosophy in <i>Applied and Molecular Parasitology</i> , should be able to	
Master the basics and methodologies of scientific research.	1-Design, conduct and publish scientific research and describe the ethical considerations in different types of scientific research. 2-Conduct research studies that add to the existing specialty knowledge and publish scientific articles/papers in indexed journals.	13-Use systematic approach to design and conduct scientific research. 14-Conduct research studied add to the existing specialty knowledge.
Work continuously to add to his/her knowledge in the field of specialty.	3-List and recognize the advanced knowledge about different parasitic diseases. 4-Describe the importance of advanced diagnostic techniques in the recognition of different parasites.	1-List and recognize the advanced knowledge about different parasitic diseases. 2-Describe the importance of advanced diagnostic techniques in the recognition of different parasites.
Apply the analytical and critical approach to knowledge in the field of specialty and related fields.	5-Interpret and analyze the impact of parasitic infections in tropical diseases, their effect on different body systems, pathogenic mechanisms, different diagnostic methods and evaluate information to solve these problems. 6-Evaluate the values of different parasitological laboratory techniques and analyze the results, apply quality control measures and add to the specialty through creativity and innovation.	3-Describe the knowledge about molecular biology and identify its important role in diagnosis and recognition of different parasites. 10-Recognize and assess prevention and control of different parasitic infections. 11- List different types of zoonotic diseases that infect human and identify the different methods of their prevention and control.
Integrate knowledge in the field of specialty with related knowledge, deduce and develop relationships between them.	7-Recall the mutual relation between professional practice and effects on the environment. 8-Compare the signs and symptoms and interpret host parasite relationship of different parasitic diseases.	4-Relate host parasite relationship as an essential part in the study of parasitic diseases. 5-List the basic concepts of immunology in parasitic disorders and discuss the regulation and disordered functions of the immune system.
Demonstrate a deep awareness of current problems and modern theories in the field of specialty.	9-Gain experience to solve epidemiological problems related to parasitic diseases.	12-Interpret surveillance data about different parasites and its application to decrease parasite load in the environment and affect incidence of parasitic diseases.
Identify professional problems and find innovative solutions to solve them.	10-Solve problems in the management of parasitic infections	7-Demonstrate pathology and pathogenesis of different parasitic diseases. 8-Describe different anti-parasitic drug groups and recall their mechanism of action in the treatment of parasitic infections.
Master a wide range of professional skills in the field of specialty.	11-Apply different diagnostic laboratory techniques with mastering the basic and advanced professional skills through proper stool, urine and blood sample collections using different stains, transportation and preparation.	2-Describe the importance of advanced diagnostic techniques in the recognition of different parasites.

Develop new methods, tools and methods for professional practice.	12-Describe different cultural methods and different types of media used as tools of research and diagnosis for various parasitic diseases.	6- Interpret and understand the importance of cultural methods as good tools in investigation of various aspects in parasitology.
Use appropriate technological means to serve his professional practice.	13-Recognize and emphasize the more complex approach in clinical parasitology encompassing several disciplines and sophisticated technology. 14-Use information technology to improve professional practice and use different sources of information to obtain data	7-Demonstrate pathology and pathogenesis of different parasitic diseases. 8-Describe different anti-parasitic drug groups and recall their mechanism of action in the treatment of parasitic infections.
Communicate efficiently and lead work teams in various professional scenarios.	15-Organize seminars with oral and written presentations and group discussion and work as a part of a team e.g lab team work	13-Use systematic approach to design and conduct scientific research
Take Decision in light of available data.	16-Take decisions in various professional situations on the basis of evidence and proofs and interpret surveillance data about different parasites and its application to decrease parasite load in the environment and affect incidence of parasitic diseases.	12-Interpret surveillance data about different parasites and its application to decrease parasite load
Employ and develop available resources efficiently and work to find new resources.	17-Perform different molecular techniques (conventional PCR, real time PCR) and interpretation of various findings.	3-Describe the knowledge about molecular biology and identify its important role in diagnosis and recognition of different parasites.
Show awareness of his/her role in community development and environmental preservation	16-Take decisions in various professional situations on the basis of evidence and proofs and interpret surveillance data about different parasites and its application to decrease parasite load in the environment and affect incidence of parasitic diseases.	12-Interpret surveillance data about different parasites and its application to decrease parasite load
Act in a manner that reflects a commitment to integrity, credibility, and professionalism.	18-Recognize importance of quality control; review its tools and its application in diagnosis of parasitic diseases. 19-Evaluate important ethical guidelines in research involving man or experimental animals	9-Recognize importance of quality control; review its tools and its application in diagnosis of parasitic diseases.
Commit to continuous self-development and transfer his/her knowledge and experiences to others.	20-Understand the value of scientific research and importance of continuous self-learning and transfer his experience to others.	14-Conduct research studied add to the existing specialty knowledge.

***Program Aims vs ILOs matrix**

IL O / Aim s	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	b11	b12	b13	b14	C1	C2	C3	C4	C5	C6	C7	C8	C9	d1	d2	d3	d4							
1	x	x			x				x	x					x		x		x	x																		x			x							
2			x	x			x						x						x										x	x									x		x							
3				x													x																							x		x						
4						x		x							x				X					x																x								
5						x																		x											x						x							
6							x		x				x			x														x													x		x			
7					x									x	x																										x			x	x			
8																							x	x																				x	x			
9				x					x				x			x																											x			x		
10								x																	x																			x	x	x		
11		x																																										x		x		
12			x											x																																x		x
13																																																
14																																																

*** Courses & thesis vs Program ILOs matrix:**

Course title	a 1	a 2	a 3	a 4	a 5	a 6	a 7	a 8	a 9	a 10	a 11	a 12	a 13	a 14	b 1	b 2	b 3	b 4	b 5	b 6	b 7	b 8	b 9	b 10	b 11	b 12	b 13	b 14	c 1	c 2	c 3	c 4	c 5	c 6	c 7	c 8	c 9	d 1	d 2	d 3	d 4						
Advanced parasitology I	X	X			X	X			X						X					X									X	X										X							
Advanced parasitology II	X	X			X	X			X						X					X									X	X										X							
Zoonosis		X									X									X				X																		X	X				
Host-Parasite Relationship	X				X	X									X				X																						X	X					
Field Studies			X					X																X							X	X									X						
Quality Control									X							X																								X	X	X	X				
Advanced Molecular Parasitology																																								X							
Prevention and Control of parasitic Diseases								X												X				X																							
Advanced Clinical Parasitology I , II					X				X					X	X			X	X									X			X	X		X	X		X					X					
Treatment of parasitic infections																				X	X				X																						
Advanced Experimental Parasitology											X										X	X																	X			X					
In Vitro Cultivation									X			X				X												X											X		X						
Malacology										X				X										X																		X					
Thesis							X																				X	X																X			

***Program ARS vs ILOs matrix**

ILO ARS	a 1	a 2	a 3	a 4	a 5	a 6	a 7	a 8	a 9	a 10	a 11	a 12	a 13	a 14	b 1	b 2	b 3	b 4	b 5	b 6	b 7	b 8	b 9	b 10	b 11	b 12	b 13	b 14	c 1	c 2	c 3	c 4	c 5	c 6	c 7	c 8	c 9	d 1	d 2	d 3	d 4								
A1	X	X																																															
A2			X																																														
A3					X																																												
A4						X																																											
A5							X																																										
A6			X						X																																								
A7									X		X	X																																					
A8							X			X			X																																				
B1														X										X																									
B2															X																																		
B3																X	X																																
B4																	X	X																															
B5																			X						X																								
B6																																																	
B7																				X		X	X		X																								
B8																					X					X																							
C1																												X																					
C2																														X																			
C3																															X	X																	
C4																																X	X																
C5																																																	
D1																																																	
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D3																																																	
D4																																																	
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***Teaching methods vs Course matrix**

	1707801	1707802	1707803	1707804	1707805	1707806	1707807	1707808	1707809	1707810	1707811	1707812	1707813	1707814
Lecture	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Practical/Clinical	X	X					X	X	X		X	X	X	
Brainstorming	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Discussion Groups	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Problem Solving								X	X					
Case Study								X	X					
Field Training					X									
Training Workshops	X	X												
Self-Directed Learning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
e-learning														
Project														