

**Program SPECIFICATION FOR medical doctorate in experimental surgery****Code: 1714800****University: Alexandria Faculty: Medical Research Institute****Program Specification****A. Basic information****1- Program title: medical doctorate in experimental surgery****2- Program type:** Single  double  multiple **3- Department(s): Experimental and Clinical surgery****4- Coordinator: Medhat Anwar****5- External evaluator(s): Professor Mohamed GABER****6- Last date of program specification approval: 8/1/2017****B. Professional Information****1- Program aims:**

Provide the students with knowledge, skills and critical awareness to make has significant contribution to research and services provided by the department.

1. Acquire and add knowledge through research and reasoning on anatomy and physiology of the pancreas, Islet cell transplantation and pancreas Xeno-transplantation, the principles of immunosuppressive drugs and the immunology of allograft and risk of zoonotic diseases.
2. Describe liver transplant operation, allograft immune response, pre- and post-transplant management of hepatitis C and medical management of the Liver transplant
3. Recognize ethical and legal aspects of medical practice and surgical practitioners, as well as the principles of evidence based surgery, how to write a protocol of a thesis. Surgical pathology.
4. To provide the student with the appropriate knowledge about different types of hernia and repairs, also about benign and malignant breast disorders.
5. To provide the student with the appropriate knowledge about new surgical techniques for GORD and its management, benign and malignant disorders of the esophagus, stomach and duodenum. To provide the student with an appropriate background covering upper GIT bleeding and intestinal fistulae.
6. Gain knowledge about surgical anatomy and physiology of the pancreas, pancreatitis and pancreatic tumors and to provide the student with the required knowledge, and skills to detect cancer pancreas at an early stage and to show the plan of management for various stages of the disease
7. To focus on endocrine surgery: thyroid, parathyroid, adrenal gland surgery and Multiple Endocrine Neoplasia (MEN) and carcinoid tumors. Recognize Acute and chronic limb ischemia, chronic venous insufficiency, diabetic foot disease, Lymphoedema, Varicose vein, Vascular access surgery and sympathectomy and to provide the student with an appropriate background covering surgical anatomy of spleen, splenomegaly, splenectomy and lymphoma.
8. Understand bowel diseases, vascular disorders of colon, functional and structural colorectal disorders and colorectal neoplasia. To provide the student with the principles of anal surgery and intestinal obstruction. To illustrate different types of stomas of GIT.



9. Understand husbandry and animal care (caging, choosing of species and strains and dosing). Origin of predictive animal testing (the "lash lure" case, elixir of sulfanilamide case, thalidomide). Role of animal research in medicine (small animals and nonhuman primates). Production of vaccines and antibiotics, increase the life spans ( kidney transplantation, open heart surgery , malignant hypertension , gastric ulcer neurological diseases ) animal in genetic engineering and their application in the cure of some human diseases
10. To provide the student with the appropriate knowledge about experimental small intestine transplantation in animal models.
11. To provide the student with the appropriate knowledge about different endoscopic equipment, principles in techniques, infection control in endoscopy and risks prevention and management. Monitor the effectiveness of upper and lower gastrointestinal endoscopy to control bleeding, diagnose tumors and their applications on experimental models.
12. Understand motility disorders of oesophagus and the use of oesophageal manometry. To provide the student with an appropriate background covering anal manometry, impedance manometry, sphincter of Oddi dysfunction and 24 h PH monitoring.
13. Describe fundamentals of ERCP in pancreatico-biliary malignancies, motility disorders of the oesophagus and anorectal manometry
14. To provide the student with the appropriate knowledge about fundamentals of laparoscopic surgery and medical malpractice in laparoscopic surgery. To provide the student with an appropriate background covering laparoscopic appendectomy, splenectomy, laparoscopic colorectal surgery, laparoscopic obesity surgery, laparoscopic repair of inguinal and ventral hernias and reflux surgery. Also to illustrate laparoscopic biliary surgery: laparoscopic cholecystectomy, cholangiography and CBD exploration and laparoscopy for abdominal pain.

## 2- Intended learning outcomes (ILOS)

### a- knowledge and understanding:

- a1-Define the main types of pancreatic transplantation, indications, complications and prognosis and principles of Xenotransplantation.
- a2-Outline the liver transplant operation with emphasis on special operative problems for donor and recipient, understand the role of immunosuppressive drugs and their different mechanisms of action
- a3-Recall ethical and legal aspects of medical practice and the principles of evidence based surgery
- a4-List different types of hernias, different hernia mechanisms and have a comprehensive overview of herniotomy, herniorrhaphy and hernioplasty, benign breast diseases and nipple disorders.
- a5-Define GERD, its complications and management, the etiology and classification of upper GIT bleeding colorectal disorders and colorectal neoplasia to reach the appropriate diagnosis and management
- a6- Recall anatomy and physiology of the biliary tract, liver and pancreas, determine investigations of the biliary tract, discuss jaundice with emphasis on obstructive jaundice (benign and malignant), surgical jaundice. Define portal hypertension (pathogenesis, clinical picture, complications and management. and determine causes, clinical picture and management of Acute and chronic limb ischemia.
- a7-Describe laboratory animal as a model of human disease, determine the biological testing and carcinogenesis and Outline operative technique in laboratory animal.
- a8-Recall basics of experimental small intestinal transplantation in animal models.



**a9-Discuss** motility disorders of oesophagus, use of impedance manometry for measurements of gastrointestinal motility and bolus transport based on intraluminal measurements of electrical Impedance.

**a10-Recall** fundamentals of ERCP, risks, prevention and management and role of ERCP in pancreatico-biliary malignancies. Discuss fundamentals of laparoscopic surgery: appendectomy and colorectal surgery, laparoscopic obesity surgery, laparoscopy in managing GERD, hiatal hernia and achalasia.

## **b- Intellectual skills:**

**b1-** Categorize problems of pancreatic transplantation, prioritize them, and generate a list of different solutions for each problem.

**b2-** Gain skills in pre-operative management of patients with end stage liver disease to ensure success of liver transplantation.

**b3** Illustrate the importance of medical ethics and legal aspects of medical practice.

**b4-** Discuss different techniques of hernia repair and breast surgery.

**b5-** Predict causes of upper GIT bleeding and propose the appropriate management and interpret the role of laparoscopy in management of upper GIT bleeding. **Analyze** causes of intestinal obstruction. Interpret the role of new diagnostic tools in managing bile duct stricture and biliary enteric fistulae.

**b6-** Interpret the results of commonly used diagnostic procedures Suspect complications of lower limb ischemia and plan for appropriate management.

**b7-** Predict diseases outcome in laboratory animal used as model for human diseases.

**b8-** Plan for prevention and management of upper and lower gastrointestinal bleeding.

**b9-** Analyze combined impedance manometry for esophageal motility testing to assess simultaneously bolus transport and associated peristalsis, thus allowing detailed analysis of the relationships between bolus transit and esophageal motility.

**b10-** Explain the role of ERCP (diagnostic & therapeutic) in pancreatico-biliary malignancies, CBD stones, cholangitis and in acute pancreatitis. Analyze causes of malpractice in laparoscopic surgery and propose solutions, and different surgical techniques.

## **c- Professional and practical skills:**

C1 Gain skills to use appropriate laboratory animals. Apply techniques to get sample or specimens.

C2 Apply main strategies for pancreatic and islet cell transplantation and choose Strategies to prolong experimental xenograft survival. Illustrate the effectiveness of immunosuppressive drugs to overcome different immunological barriers, and illustrate allograft immunology.

C3 Demonstrate liver transplantation in non-alcoholic Fatty liver disease and long term metabolic complications. Choose operation of liver transplantation. Apply strategies and assessment to optimize pre- and post-transplant management of hepatitis B& C and hepatocellular carcinoma.

C4 Practice Evidence Based Surgery, surgical practitioners, ethical and legal aspects of medical practice. Practice writing of thesis protocol.

C5 Examine diabetic foot infection, functional tumors and paraneoplastic syndrome.

C6 Practice patient examination for hernia and breast, choose techniques for hernia and breast lumps and nipple.

C7 Choose surgical techniques in the management of breast cancer patients.

C8 Apply the effectiveness of GORD therapy and surgical management by identifying clinical and investigative parameters that can be used in assessing the patient's response to treatment and re-evaluate management plan accordingly. Demonstrate main strategies



- to optimize successful management of upper GIT bleeding
- C9 Choose patients with haemorrhoids, rectal prolapsed, colonic infestations, cancer anus and perform appropriate initial therapy.
  - C10 Apply main surgical strategies of management of cholangitis and pancreatic neolasms and cholangiocarcinoma, endocrine diseases, portal hypertension and lymphoma.
  - C11 Practice strategies of management (surgery and endovascular techniques) of acute and chronic venous insufficiency, post phlebitis syndrome, lower limb ischemia, arteriovenous fistulae and diabetic foot disease.
  - C12 Demonstrate lymphatic system and the spleen and lymphoma.
  - C13 Apply main strategies to prolong experimental graft survival and intestinal transplantation and solve problems of graft rejection and animal models.
  - C14 Practice technique skills in gastrointestinal endoscopy and new techniques: endoscopic ultrasound and enteroscopy.
  - C15 Apply main strategies to optimize the use of ERCP as diagnostic and therapeutic tool.
  - C16 Apply the effectiveness of laparoscopy in bariatric surgery, biliary surgery, and splenectomy and in diagnosis & management of colonic malignancies and pain and in management of GERD, hiatal hernia and achalasia.
  - C17 Demonstrate laparoscopic repair for inguinal and ventral hernias and errors.
  - C18 Practice main strategies to optimize laparoscopic biliary surgery: laparoscopic cholecystectomy, cholangiography and CBD exploration and errors.

**d- General and transferable skills:**

- d1 Communicate effectively using scientific language and reasoning.
- d2 Work effectively and cooperatively in a team.
- d3 Maintain an open and questioning mind toward ideas and alternative points of view.
- d4 Manage scientific meetings and Utilize time appropriately.

---

**3- Academic standards**

**3a External references for standards (Benchmarks)**

Generic Academic Reference Standards if the National Authority for Quality Assurance and Accreditation of Education (NAQAAE)

**Date of Academic Reference standards (ARS) approval by Institute Council:  
6/9/2017**



### 3b Comparison of provision to selected external references

NAQAAE	ARS for doctorate in experimental surgery
<b>A1-Basic facts , theories, of the specialty and related subjects/ fields</b>	A1- Describe laboratory animal as a model of human disease, the main types of pancreatic and liver transplant, small intestinal transplantation in animal models, different types of hernias and herniotomy, herniorrhaphy and hernioplasty.
<b>A2- Mutual relation between professional practice and effects on environment</b>	A-2 Have fluent deep knowledge and understanding of benign breast diseases and nipple disorders, principles of evidence based medicine and laparoscopic surgery. A3 Discuss GORD, diagnosis and management of upper GIT bleeding, colorectal disorders and colorectal neoplasia, jaundice, Cystic disease of biliary tract, portal hypertension and management of acute and chronic limb ischemia
<b>A3- Recent advances in the field of practice</b>	A-4 Describe endoscopic equipments, fundamentals of ERCP and motility disorders of oesophagus
<b>A4-Details of ethical &amp; legal practice</b>	A-5 Recognize ethical and legal aspects of medical practice, review the principles of evidence based surgery.
<b>A5 -Quality standards of the practice</b>	A-7 Discuss the impact of surgical care practitioners on surgical training.
<b>A6- Design, conduction &amp; publishing of scientific research</b>	A-6 Define how to write a protocol of a thesis.
<b>A7- Ethical considerations in different types of scientific research</b>	A-5 Recognize ethical and legal aspects of medical practice, review the principles of evidence based surgery.
<b>B1- Analyze, deduce, extrapolate &amp; evaluation of information</b>	B-3 Categorize the different causes of intestinal obstruction, interpret the role of new diagnostic tools in the management of bile duct strictures and suspect complications of lower limb ischemia.
<b>B2- Solve the majority of problems in the specialty according to the available data ( complete or incomplete)</b>	B-4 Plan for prevention and management of upper and lower gastrointestinal bleeding, explain the role of ERCP (diagnostic & therapeutic) in pancreatobiliary malignancies and Analyze combined impedance manometry for esophageal motility testing.
<b>B3- Conduct research studies that add to the existing specialty knowledge</b>	B2 Analyze the importance of medical ethics, and laparoscopic surgery  B-5 Appraise evidence based Surgery, surgical practitioners, ethical and legal aspects of medical practice, and practice writing of thesis protocol.
<b>B4- Publish scientific articles/papers ( in indexed journals)</b>	B-5 appraise Evidence Based Surgery, surgical practitioners, ethical and legal aspects of medical



	practice, and practice writing of thesis protocol.
<b>B5- Plan and implement ( or supervise implementation of) enhancement &amp; Improvement approaches to practice</b>	B-1 Predict diseases outcome in laboratory animal used as model for human diseases, review problems of pancreatic and liver transplantation and importance of experimental small intestinal transplantation in animal models and evaluate techniques of hernia repair
<b>B6- Take decisions in various professional situations ( including dilemmas &amp; controversial issues)</b>	B-4 Plan for prevention and management of upper and lower gastrointestinal bleeding, explain the role of ERCP (diagnostic & therapeutic) in pancreatobiliary malignancies and Analyze combined impedance manometry for esophageal motility testing.
<b>B7- Add to the specialty field through creativity &amp; innovation</b>	B-1 Predict diseases outcome in laboratory animal used as model for human diseases, review problems of pancreatic and liver transplantation and importance of experimental small intestinal transplantation in animal models and evaluate techniques of hernia repair
<b>B8- Manage discussions on basis of evidence and proofs</b>	B-5 Appraise Evidence Based Surgery, surgical practitioners, ethical and legal aspects of medical practice, and practice writing of thesis protocol.
<b>C1- Competent in all basic and all required advanced professional skills ( to be determined according to the specialty board/ department)</b>	C-4 Monitor the effectiveness of GORD therapy , gain skills in practicing gastrointestinal endoscopy, oesophageal manometry, impedance manometry, Sphincter of Oddi manometry & anorectal manometry, optimizing the use of ERCP.
<b>C2- Write and appraise reports</b>	C-2 Practice Evidence Based Surgery and laparoscopic surgery.
<b>C3- Evaluate and improve methods and tools used in specialty</b>	C-3 Apply surgical management for variable colorectal disorders, apply main strategies of management of cholangitis, lower limb ischemia, and diabetic foot disease.
<b>C4- Use technology to advance practice</b>	C-1 Tailoring the new surgical techniques to be tried on animal labs, apply main strategies to prolong experimental xenograft survival and experimental graft survival and gain experience in the management of breast cancer patients
<b>C5- Plan professional development courses to improve practice and enhance performance of juniors</b>	C-5 Gain skills for anesthesia and anatomy, apply techniques to get sample or specimen, and gain skills to use appropriate laboratory animals.
<b>D1- Communicate effectively using all methods</b>	D-1 Communicate effectively using scientific language and reasoning.
<b>D2- Use information technology to improve his/her professional practice</b>	D-3 Maintain an open and questioning mind toward ideas and alternative points of view.
<b>D3- Teach and evaluate others</b>	D-4 Develop skills for oral presentation
<b>D4- Perform self-appraisal &amp; seek continuous learning</b>	D-5 Evaluate their learning and personal planning processes and be resourceful.
<b>D5- Use different sources of information to obtain data</b>	D-5 Evaluate their learning and personal planning processes and be resourceful.
<b>D6- Work in teams as well as a member in larger teams</b>	D-2- Work as a part of team



**D7- Manage scientific meetings and appropriately utilize time**

D-4 Develop skills for oral presentation

#### 4- Curriculum structure and contents

4.a program duration: 5 – 7 years

4.b program structure : 24 credit hours + 24 thesis

4.b.i- No. of hours per week in each year/semester:

Semester	Core Courses	Elective Courses
	No. of hours	No. of hours
First semester	(1714806) 2 credit hours	
Second semester	(1709840- 1714803) 6 credit hours	
Third semester	(1714801-1714814) 2 credit hours	2 credit hours
Fourth semester	(1714804-1714805) 4 credit hours	
Fifth semester	(1714802-807) 4 credit hours	
Sixth semester	(1714808-1710820) 2 credit hours	2 credit hours

4.b.ii- No. of credit hours      Lectures            Clinical            Total     

   Compulsory            Elective            Optional     

4.b.iii- No. of credit hours of basic science courses      No.            %     

4.b.iv- No. of credit hours of courses of social sciences and humanities.      No.            %     

4.b.v- No. of credit hours of specialized courses      No.            %     

4.b.vi- No. of credit hours of other courses      No.            %     

4.b.vii-Practical/Field Training      No            %

**4.b.viii- Program levels (in credit-hours system) :**

Student is required to pass at least 12 credit hours with CGPA not less than C+ before submitting a thesis proposal.

**5- Program Courses****5.1- Compulsory(20 credit hours)**

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Clinical
1709840	Advanced Laboratory Animal Science	2	1	2
1714801	Experimental Pancreas Transplantation	2	1	2
1714802	Experimental Liver Transplantation	2	1	2
1714803	Advanced Science for Applied Surgery	4	2	4
1714804	Updating Surgery I	2	1	2
1714805	Updating Surgery II	2	1	2
1714806	Updating Surgery III	2	1	2
1714807	Updating Surgery IV	2	1	2
1714808	Updating Surgery V	2	1	2

**5.2- Elective I (4 credit hours)**

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Clinical
1714810	Experimental Small Intestine Transplantation	2	1	2
1714811	Gastrointestinal Endoscopy	2	1	2
1714812	Endoscopic retrograde cholangiopancreatography	1	-	2
1714813	Gastrointestinal Motility Studies	1	-	2
1714814	Laparoscopic Surgery II	2	1	2
1710820	Pathology	3	2	2(Practical)



**5.3- Elective II : None****5.4- Optional – (none)**

**6- Program admission requirements:** Postgraduate students with a M.Sc. or an equivalent degree in Surgery or Experimental Surgery.

**7- Regulations for progression and program completion**

For the progression and completion of the program to obtain the degree of master of experimental surgery, the student must:

1. Complete 24 credit hours with CGPA of at least C+.
2. Submit a thesis validity report by an examination committee approved by the department council and their members include at least one external examiner.

**8- Evaluation of Students enrolled in the program.**

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

**Evaluation of the Program**

Evaluator	Tool	Sample
1- Senior students	Interview	At least 50 %
2- Alumni	Interview	Representative sample
3- Stakeholders (Employers)	Interview	Representative sample
4- External Evaluator(S) or External Examiner (s)	Reports	Professor Mohamed Amin Saleh
5- Other		

**Dates of Previous editions/revisions:**

Editions/Revisions Number	Date
---------------------------	------



Edition no.1	2009
Edition no. 2	2011
Edition no.3	5/6/2014
Edition no.3, revision no.1	12/2014
Edition no.3, revision no.2	10/2016

**Program coordinator:**

Name: Medhat Anwar

Signature: .....

**Department Head:**

Name: Ahmad Saad

Signature: .....

**Date of Department Council Approval: 6/9/2017**



### Program Aims vs ILOs matrix

program aims	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>ILOs</b>														
<b>a1</b>	x													
<b>a2</b>		x												
<b>a3</b>			x											
<b>a4</b>				x										
<b>a5</b>					x									
<b>a6</b>						x								
<b>a7</b>							x							
<b>a8</b>								x						
<b>a9</b>									x					
<b>a10</b>										x				
<b>b1</b>	x													
<b>b2</b>		x												
<b>b3</b>			x											
<b>b4</b>				x										
<b>b5</b>					x									
<b>b6</b>						x								
<b>b7</b>							x							
<b>b8</b>								x						
<b>b9</b>									x					
<b>b10</b>										x				
<b>c1-3</b>									x					
<b>c4-6</b>	x													
<b>c7</b>		x												
<b>c8</b>			x											
<b>c9</b>				x										
<b>c10</b>					x									
<b>c11</b>						x								
<b>c12</b>							x							
<b>c13</b>								x						
<b>c14</b>										x				
<b>c15</b>											x			
<b>c16</b>												x		
<b>c17</b>													x	
<b>c18</b>														x
<b>d1</b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x



<b>d2</b>	x	x	x	x	x	x	x	x	x	x	X	x	x	x	x
<b>d3</b>	x	x	x	x	x	x	x	x	x	x	X	x		x	x
<b>d4</b>	x	x	x	x	x	x	x	x	x	x	X	x	x	x	

**Courses vs Program ILOs matrix**

COU	170	171	171	171	171	171	171	171	171	171	171	171	171	171	171
RSE	984	480	480	480	480	480	480	480	480	480	481	481	481	481	481
S	0	1	2	3	4	5	6	7	8	0	1	2	3	4	
<b>ILOs</b>															
<b>a1</b>	x														
<b>a2</b>		x													
<b>a3</b>			x												
<b>a4</b>				x											
<b>a5</b>					x										
<b>a6</b>						x									
<b>a7</b>							x								
<b>a8</b>								x							
<b>a9</b>									x						
<b>a10</b>										X					
<b>b1</b>	x														
<b>b2</b>		x													
<b>b3</b>			x												
<b>b4</b>				x											
<b>b5</b>					x										
<b>b6</b>						x									
<b>b7</b>							x								
<b>b8</b>								x							
<b>b9</b>									x						
<b>b10</b>										X					
<b>c1-3</b>									x						
<b>c4-6</b>	x														
<b>c7</b>		x													
<b>c8</b>			x												
<b>c9</b>				x											
<b>c10</b>					x										
<b>c11</b>						x									
<b>c12</b>							x								
<b>c13</b>								x							
<b>c14</b>										X					
<b>c15</b>											x				
<b>c16</b>												x			
<b>c17</b>														x	



<b>c18</b>														X
<b>d1</b>	x						x							
<b>d2</b>		x				x		x		X		x		x
<b>d3</b>			x		x				x		x		x	x
<b>d4</b>				x			x	x	x	X	x	x	x	x



### ARS vs ILOs matrix

ARS	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6	D7
ILOs	x																											
a1		x			x	x				x		x	x	x	x		x	x			x		x	x	x		x	
a2								x	x		x			x		x			x	x		x			x			x
a3	x		x		x		x																					
a4		x		x		x		x		x		x	x		x		x		x		x		x	x		x	x	
a5				x			x		x		x			x		x		x		x		x			x			x
a6		x	x	x			x						x					x						x		x		
a7	x				x						x	x	x			x	x	x				x	x	x		x		x
a8						x		x		x					x				x		x						x	
a9	x		x						x					x						x					x			
a10		x			x					x		x			x		x				x		x				x	
b1				x				x	x					x					x	x					x			
b2	x		x				x											x										
b3		x			x					x		x	x		x		x				x		x	x		x	x	
b4				x		x		x			x					x			x			x						x
b5	x								x					x				x		x					x			
b6			x		x		x			x					x						x						x	
b7		x						x				x	x				x		x				x	x		x		
b8				x		x	x				x					x						x						x
b9			x						x				x	x				x		x				x	x	x		
b10	x				x		x					x					x						x					
c1-3		x		x	x				x	x		x		x	x		x			x	x		x		x		x	
c4-6																												
c7	x	x	x			x		x		x	x		x		x	x			x		x	x		x		x	x	x
c8				x			x					x						x	x				x					
c9			x		x				x		x			x		x				x		x			x			x



<b>c10</b>	x	x				x				x			x		x					x			x		x	x				
<b>c11</b>			x					x			x				x			x			x							x		
<b>c12</b>			x	x			x				x	x			x	x	x				x	x						x		
<b>c13</b>		x			x		x		x	x				x	x					x	x				x		x			
<b>c14</b>		x		x	x				x	x		x	x		x				x	x		x		x		x		x		
<b>c15</b>	x					x		x							x								x			x				
<b>c16</b>		x		x						x		x		x	x	x				x		x					x			
<b>c17</b>		x		x	x		x			x		x	x	x	x				x		x	x	x	x		x		x		
<b>c18</b>			x		x			x	x		x			x		x			x	x		x				x			x	
<b>d1</b>																														
<b>d2</b>	x	x		x		x	x	x		x		x	x		x		x		x		x		x	x		x	x			
<b>d3</b>			x		x					x		x			x		x			x		x				x			x	
<b>d4</b>	x					x	x	x		x							x									x		x		



**Teaching methods used in each course**

	170984 0	171480 1	171480 2	171480 3	171480 4	171480 5	171480 6	171480 7	171480 8	171481 0	171481 1	171481 2	171481 3	171481 4
<b>Lecture</b>	x	x	x	x	x	x	x	x	x	x	x			x
<b>Clinical</b>	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>Brainstorming</b>	x			x			x	x	x	x	x			x
<b>Discussion Groups</b>		x			x				x			x		
<b>Problem Solving</b>			x			x			x	x			x	
<b>Case Study</b>	x	x				x					x			
<b>Field Training</b>														
<b>Role playing</b>			x											
<b>Training Workshops</b>			x										x	
<b>Self-Directed Learning</b>				x	x			x				x	x	x
<b>e-learning</b>														
<b>Project</b>	x	x								x		x		