國立台灣大學醫學院
107 學年度學習指引；3-1

大體解剖學及實驗上、組織學上、生理學甲上、胚胎學上

臺大醫學院共同教育及教師培訓中心　編印

編 輯 緣 起

本院自八十一學年度起開始編輯及出版學習指引系列。其最主要目的是讓學生對於各學科的學習內容，以及教師的教學進度、教學方式、作業或評量要求等有一全面性的瞭解，以加強學習效果。

編輯學習指引系列的另一目的是希望能藉其使不同學科的教師及同一學科的授課老師，彼此了解授課的內容及教學的方式，加強學習內容的協調，避免不必要的重複或遺漏，以提昇本院的教學品質。

完整的學習指引，其內容應包括：①該學科的教學目標，②教學進度，③所涵蓋的單元主題，④教學方法及詳細的教學活動方式，⑤詳細的作業及成績評量規定，⑥參考資料，⑦教師的其他要求。

本指引每年均根據老師與學生反應由相關單位的授課教師提供修正資料，以期更能充實內容；同時希望使用本指引的同學能夠繼續提出修正的建議，使學習指引系列的內容更能符合同學的學習需求。

臺大醫學院　共同教育及教師培訓中心

民國 107 年 8 月

序

醫學系的教育目標是讓學生在七年的修業期間之內能夠學習到做為一個醫師所必須具備的知識、技能、態度並培養終生學習的動機和主動學習的習慣。此一目標的達成必須依賴教師與學生的共同合作；教師方面以積極的熱忱提供各種教學活動，學生方面則應有充分的配合意願與行動。除了知識與技能之外，豐富的人性與積極的社會使命感等做為醫師必須具備的人格、科學的思考能力以及適當判斷力的養成，尤其需要學生方面的體能及力行。

本手冊的主要目的在於讓學生了解本系目前的課程、教學計畫、及教學主題，希望他有助於促進師生間良好的溝通，學生能夠了解而且善盡自己的學習責任，教師能夠妥適規劃教學內容，以提昇醫學系的教學品質。

自八十三學年度開始，本院醫學系一年級至六年級的學生均按照新課程實施教學；已將臨床預備階段的傳統型課程轉變為整合型課程，將臨床階段的傳統型課程轉變為核心、選修型課程；啟發式小班教學也全面實施並逐漸落實。在這新階段的開始，希望教師同仁們繼續在教學方面加以改進，使本院的新課程能夠展示其效果。

教學改進的成功有賴於事前的充分準備、學生的充分了解、教師的充分配合，以及不斷的檢討改進，希望本手冊的編印能對於提昇本院的教學品質，提高本院的教學成效有所協助。

敬請使用本手冊的教師同仁以及同學，對於本書在內容方面的缺失及應改進的地方，提出高見，以便修正。

臺大醫學院　共同教育及教師培訓中心

民國 107 年 8 月

目　　錄

壹、醫學系三年級整合課程教學時間表

107 學年度第 1 學期

第一週－Introduction & [Integumentary /Muscloskeletal]

日期	時間	科別	主題	教師
09/10 Mon	08:10-08:30	組織	Introduction (20 min)	王淑慧
	08:00-08:45	組織	LM technique (15 min)	龔秀妮
	08:45-09:00	組織	EM technique (15 min)	龔秀妮
	09:10-10:00	組織	Cell (I)	黃敏銓
	10:20-12:10	組織	Lab orientation; Microscope check-out (三東) Slide box check-out (三東)	全體教師
	13:20-15:10	小組討論	解剖、生理小組討論(含課前教育)	小班老師
09/11 Tue	08:10-08:40	大體解剖	**Introduction** (501)	李立仁
	08:40-12:10	大體解剖	Basic terms in Anatomy (501) Skeletal system **I**: Vertebrae and Thoracic cage (501)	謝松蒼
	13:20-15:10	組織	Cell (II)	黃敏銓
	15:30-17:20	組織	Epithelial Tissue	龔秀妮
09/12 Wed	13:20-15:10	組織	Muscular Tissue	王淑慧
	15:30-17:20	組織	***Muscular Tissue Lab and Epithelial Tissue***	全體教師
09/13 Thu				
09/14 Fri				

備註：

＊為尊重大體老師及感謝家屬，除特殊理由請假外，請同學務必出席大體老師之重要儀式。

＊本校成績優良書卷獎獲獎基本資格，當學期修課不得少於十五學分。

1. 大講堂上課教室：基礎醫學大樓 501、302 講堂
2. 107 年 09 月 10 日（星期一）本學期上課開始
3. 107 年 09 月 24 日（星期一）中秋節放假日
4. 107 年 10 月 10 日（星期三）國慶紀念日
6. 107 年 11 月 15 日（星期四）本校校慶(停課一天)
7. 107 年 12 月 31 日（星期一）調整放假(於 12 月 22 日星期六補上班、上課)
8. 108 年 01 月 01 日（星期一）開國紀念日
9. 108 年 01 月 04 日（星期五）本學期上課最後一天

第二週－Introduction & [Muscloskeletal] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
09/17 Mon	08:10-10:00	組織	Connective Tissue	龔秀妮
	10:20-12:10	組織	***Connective Tissue Lab***	全體教師
	13:20-15:10	小組討論	解剖、生理小組討論 單元一：遺傳基因 I（人文社會）	小班老師
09/18 Tue	08:10-10:00	大體解剖	**Lab: Skeletal system: Vertebrae and Thoracic cage** (三東) 分發骨箱	謝松蒼
	10:20-12:10	胚胎	Introduction; Bilaminar and trilaminar germ disk	黃敏銓
	13:20-17:20	大體解剖	Skeletal system **II**: Cranial skeleton (501) 大體老師家庭訪視行前輔導 03:30-05:20	謝松蒼 ***蔡詩力***
09/19 Wed	13:20-15:10	大體解剖	Lab Cranial skeleton (三東)	謝松蒼
	15:30-17:20	胚胎	Embryonic and fetal period	賴逸儒
09/20 Thu				
09/21 Fri	13:05-13:20	生理	Introduction	胡孟君
	13:20-17:20	生理	Ion channels & Membrane excitability	郭鐘金

第三週－[Muscloskeletal] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
09/24 Mon	中秋節(放假日)			
09/25 Tue	08:10-10:00 10:20-12:10 13:20-17:20	組織 組織 大體解剖	Cartilage & Bone & Bone Formation ***Cartilage & Bone & Bone Formation Lab*** Skeletal system **II**: Facial skeleton (501) Lab Facial skeleton (三東) 03:30-05:20	王淑慧 全體教師 謝松蒼
09/26 Wed	13:20-17:20	大體解剖	Skeletal system III: Upper limb (501) Lab Upper limb (三東) 15:10-17:20	謝松蒼
09/27 Thu				
09/28 Fri	13:20-17:20	生理	Muscle	郭鐘金

第四週－[Muscloskeletal/Nervous] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
10/01 Mon	08:10-10:00	胚胎	Placenta and fetal membrane	賴逸儒
	10:20-12:10	大體解剖	Skeletal system IV: Lower limb (501)	謝松蒼
	13:20-15:10	小組討論	解剖、生理小組討論 單元一：遺傳基因 I（人文社會） 單元二：安寧緩和醫療（人文社會）	小班老師
10/02 Tue	08:10-10:00	組織	Blood	黃敏銓
	10:20-12:10	組織	***Blood Lab and lab review***	全體教師
	13:20-15:10	胚胎	Skeletal and muscular system	李立仁
	15:30-17:20	大體解剖	***Lower limb Lab***	謝松蒼
10/03 Wed	09:10-12:10	生理	Blood	余佳慧
	13:20-15:10	大體解剖	Vascular system **I** (501)	陳玉怜
	15:30-17:20	大體解剖	***Vascular system I Lab***	全體教師
10/04 Thu				
10/05 Fri	13:20-17:20	生理	Heart	李宗玄

第五週－ [Muscloskeletal/Nervous] & [Blood/Heart/Circulation]

日期	時間	科別	主題	教師
10/08 Mon	08:10-10:00	大體解剖	Vascular system **II** (501)	陳玉怜
	10:20-12:10	大體解剖	***Vscular system II Lab***	
	13:20-15:10	小組討論	解剖、生理小組討論 單元二：安寧緩和醫療（人文社會）	小班老師
10/09 Tue	08:10-12:10	大體解剖	Muscular system I (501)	李立仁
	13:20-15:10	組織	Cardiovascular System	陳玉怜
	15:30-17:20	組織	***Cardiovascular System Lab***	全體教師
10/10 Wed	國慶紀念日			
10/11 Thu				
10/12 Fri	13:20-15:10	生理	Heart	李宗玄
	15:30-17:20	生理	心臟電生理綜合討論	湯志永

第六週－[Integumentary /Muscloskeletal/Nervous] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
10/15 Mon	08:10-10:00 10:20-12:10 13:20-15:10	組織 組織 小組討論	Nervous Tissue (PNS) ***Nervous Tissue (PNS) Lab*** 解剖、生理小組討論 單元二：安寧緩和醫療（人文社會） 單元三：遺傳基因 II（人文社會）	謝松蒼 全體教師 小班老師
10/16 Tue	08:10-10:00 10:20-12:10 13:20-17:20	組織 組織 大體解剖	Integumentary System ***Integumentary System Lab*** Muscular system **II** (501)	龔秀妮 全體教師 李立仁
10/17 Wed	10:20-12:10 13:20-15:10 15:30-17:20	生理 組織 大體解剖	Clinical ECG **Quiz (I)**； Lab Review (三東) ***Muscular system Lab***	蔡佳醍 全體教師 李立仁
10/18 Thu				
10/19 Fri	13:20-15:10	生理	Lab 1: 動物保定、消防安全與 Chart 軟體介紹	

第七週－[Integumentary /Muscloskeletal/Nervous] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
10/22 Mon	08:10-12:10	組織	**Histology Exam (Lec and Lab)**	全體教師
	13:20-15:10	小組討論	解剖、生理小組討論 單元三：遺傳基因 II（人文社會）	小班老師
10/23 Tue	08:10-09:00	胚胎	Integumentary system	龔秀妮
	09:10-12:10	大體解剖	Nervous system **I** (501)	謝松蒼
	13:20-15:10	組織	Nervous Tissue (CNS)	謝松蒼
	15:30-17:20	組織	***Nervous Tissue (CNS) Lab***	全體教師
10/24 Wed	09:10-12:10	生理	Circulation	張哲逢
	13:20-15:10	大體解剖	Nervous system **II** (501)	謝松蒼
	15:30-17:20	大體解剖	***Skeletal and Muscular systems Lab II*** ***Lab Review***	李立仁
10/25 Thu				
10/26 Fri	13:20-16:20	生理	Circulation	張哲逢

第八週–[Muscloskeletal/Nervous] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
10/29 Mon	08:10-12:10	大體解剖	**Midterm Exam: Skeletal, Muscular, Nervous, Vascular system (Lec + Lab)**	**全體教師**
	13:20-15:10	小組討論	解剖、生理小組討論 單元三：遺傳基因 II（人文社會） 單元四：下肢（解剖）	小班老師
10/30 Tue	08:10-09:50	大體解剖	**Pectoral region and Axilla (I) (Lec) (501) Upper limb**	黃敏銓
	09:50-10:10	大體解剖	針扎割傷處理 Lab safety and skin preparation	葉啟娟
	10:10-11:00	大體解剖	啟用儀式預演	全體教師
	11:00-12:10	大體解剖	大體老師啟用儀式	
	13:20-17:20	大體解剖	***Lab orientation*** (501) ***Pectoral region Lab***	黃敏銓
10/31 Wed	09:10-11:10	生理	Circulation	張哲逢
	11:20-12:10	生理	Lab 2: Cardiovascular simulation	張哲逢
	13:20-17:20	大體解剖	***Axilla Lab***	黃敏銓
11/01 Thu				
11/02 Fri	13:20-17:20	生理	Lab 3 : 心電圖描記術&動脈血壓及寒冷檢壓試驗	

第九週－[Muscloskeletal/Nervous] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
11/05 Mon	08:10-12:10	大體解剖	Arm and cubital region & Superficial back and scapular region (Lec + Lab) ***Brachial and Anterior cubital regions Lab*** ***Back & Scapular and deltoid regions Lab***	黃敏銓
	13:20-15:10	小組討論	解剖、生理小組討論 單元四：下肢（解剖）--與物治系跨學系討論	小班老師
11/06 Tue	08:10-12:10	大體解剖	Forearm (I) (Lec + Lab) ***Back & Scapular and deltoid regions Lab***	黃敏銓
	13:20-17:20	大體解剖	***Forearm (II) Lab***	黃敏銓
11/07 Wed	10:20-12:00	生理	期中考	
	13:20-17:20	大體解剖	Hand (Lec + Lab) ***Hand Lab***	黃敏銓
11/08 Thu				
11/09 Fri	12:30-17:20	生理	Lab 4-1: 影響動脈血壓之諸多因素&神經刺激與肌肉收縮	

第十週－[Respiratory] &[Blood/Heart/Circulation]

日期	時間	科別	主題	教師
11/12 Mon	08:10-10:00 10:20-12:10 13:20-15:10	大體解剖 大體解剖 小組討論	Joints of shoulder girdle and upper limb Lec ***Joints of shoulder girdle and upper limb Lab*** 解剖、生理小組討論 單元四：下肢（解剖）-與物治系跨學系討論 單元五：心血管循環系統（生理、解剖） --與物治系跨學系討論	曾國藩 曾國藩 小班老師
11/13 Tue	08:10-09:00 09:10-12:10 13:20-15:10 15:30-17:20	大體解剖 大體解剖 大體解剖 大體解剖	***Clinical lecture*** **Lab review** Thoracic wall and Lungs ***Thoracic wall Pleural cavities and Lungs Lab***	***謝榮賢*** 李立仁
11/14 Wed	13:20-15:10 15:30-17:20	組織 組織	Respiratory System ***Respiratory System Lab***	陳玉怜 全體教師
11/15 Thu	本校校慶停課一天			
11/16 Fri	12:30-17:20	生理	Lab 4-2: 影響動脈血壓之諸多因素&神經刺激與肌肉收縮	

第十一週－[Respiratory] & [Digestion]

日期	時間	科別	主題	教師
11/19 Mon	08:10-12:10	大體解剖	Middle mediastinum and Heart (I) ***Middle mediastinum and Heart Lab***	李立仁
	13:20-15:10	小組討論	解剖、生理小組討論 單元五：心血管循環系統（生理、解剖） --與物治系跨學系討論	小班老師
11/20 Tue	08:10-10:00	胚胎	Respiratory system	陳玉怜
	10:20-12:10	大體解剖	Middle mediastinum and Heart (II) ***Middle mediastinum and Heart Lab***	李立仁
	13:20-15:10	組織	Lymph Node & Thymus	許書豪
	15:30-17:20	組織	***Lymph Node & Thymus Lab***	全體教師
11/21 Wed	13:20-15:10	組織	Spleen, Tonsil & Haemopoiesis	許書豪
	15:30-17:20	組織	***Spleen, Tonsil & Haemopoiesis Lab***	全體教師
11/22 Thu				
11/23 Fri	13:20-16:20	生理	Respiration	賴亮全

第十二週－[Respiratory] & [Digestion]

日期	時間	科別	主題	教師
11/26 Mon	08:10-10:00 10:20-12:10 13:20-15:10	胚胎 大體解剖 小組討論	Cardiovascular system (I) Superior and Posterior mediastinum; Joints of thorax ***Superior and Posterior mediastinum Lab*** 解剖、生理小組討論 單元五：心血管循環系統（生理、解剖） --與物治系跨學系討論 單元六：血液系統（生理）	黃敏銓 李立仁 小班老師
11/27 Tue	08:10-12:10 13:20-17:20	大體解剖 大體解剖	Anterior abdominal wall (I) **Abdomen** ***Anterior abdominal wall Lab*** Anterior abdominal wall (II) and The abdominal cavity (I)	賴逸儒 賴逸儒
11/28 Wed	09:10-12:10 13:20-17:20	生理 大體解剖	Respiration The abdominal cavity (II) ***Abdomino-pelvic cavity in situ Lab***	賴亮全 賴逸儒
11/29 Thu				
11/30 Fri	13:20-14:10 14:20-15:10	生理 生理	Respiration Lab 5: 呼吸生理學模擬軟體	賴亮全 賴亮全

第十三週－[Respiratory] & [Digestion]

日期	時間	科別	主題	教師
12/03 Mon	08:10-10:00 10:20-12:10 13:20-15:10	胚胎 大體解剖 小組討論	Cardiovascular system (II) Detailed examination of abdominal viscera(I) ***Detailed examination of abdominal viscera Lab*** 解剖、生理小組討論 **英文口頭報告**	黃敏銓 賴逸儒 小班老師
12/04 Tue	08:10-12:10 13:20-15:10 15:30-17:20	大體解剖 組織 組織	Detailed examination of abdominal viscera(II) ***Detailed examination of abdominal viscera Lab*** Oral cavity & Teeth ***Oral cavity & Teeth Lab***	賴逸儒 錢宗良 全體教師
12/05 Wed	09:10-12:10 13:20-15:10 15:30-17:20	生理 組織 組織	Digestion Major salivary gland, Esophagus & Stomach ***Major salivary gland, Esophagus & Stomach Lab***	余佳慧 王淑慧 全體教師
12/06 Thu				
12/07 Fri	13:20-16:20	生理	Lab 6: 人體呼吸之化學調節	

第十四週－[Respiratory] & [Digestion] & [Uro-genitary and affiliate]

日期	時間	科別	主題	教師
12/10 Mon	08:10-10:00	組織	Intestine and Pancreas	陳玉怜
	10:20-12:10	組織	***Intestine and Pancreas Lab***	全體教師
	13:20-15:10	小組討論	解剖、生理小組討論 單元六：血液系統（生理）	小班老師
12/11 Tue	08:10-09:00	胚胎	Congenital heart disease	王主科
	09:10-12:10	大體解剖	Kidney and Suprarenal gland	賴逸儒
			Kidney and Suprarenal gland Lab	
	13:20-15:10	組織	Liver & Gall Bladder	許書豪
	15:30-17:20	組織	***Liver & Gall Bladder Lab***	全體教師
12/12 Wed	09:10-12:10	生理	Digestion	余佳慧
	13:20-15:10	組織	Kidney & Lower Urinary tract	陳玉怜
	15:30-17:20	組織	***Kidney & Lower Urinary tract Lab***	全體教師
12/13 Thu				
12/14 Fri	13:20-17:20	生理	Kidney	林水龍

第十五週－[Digestion] & [Uro-genitary and affiliate]

日期	時間	科別	主題	教師
12/17 Mon	08:10-12:10 13:20-15:10	大體解剖 小組討論	Posterior abdominal wall and Diaphragm (Lec+ Lab) 解剖、生理小組討論 單元六：血液系統（生理） 單元七：胸腔系統（生理、解剖）	王淑慧 小班老師
12/18 Tue	08:10-10:00 10:20-12:10 13:20-17:20	胚胎 組織 大體解剖	Digestive System **Lab Review (三東)** Gluteal region (Lec+ Lab) **Pelvis & Perineum**	賴逸儒 全體教師 陳玉怜
12/19 Wed	08:10-10:00 13:20-17:20	生理 大體解剖	Kidney Blood vessels, nerves and muscles of pelvis (Lec+ Lab) (I) ***Pelvic wall; Scrotum, spermatic cord, and testis Lab***	林水龍 陳玉怜
12/20 Thu				
12/21 Fri	12:30-17:20	生理	Lab 7-1: 腸道雙醣酶活性實驗&腎臟調控體液的能力	
12/22 Sat	08:10-12:10	大體解剖	Blood vessels, nerves and muscles of pelvis (Lec+ Lab) (II) Pelvic viscera (I) (Lec+ Lab) ***Pelvic wall; Scrotum, spermatic cord, and testis Lab***	陳玉怜

第十六週－[Uro-genitary and affiliate]

日期	時間	科別	主題	教師
12/24 Mon	08:10-09:00 09:10-12:10 13:20-15:10	組織 大體解剖 小組討論	**<u>Quiz(II)</u>** Pelvic viscera (II) (Lec+ Lab) 解剖、生理小組討論 單元七：胸腔系統（生理、解剖）	全體教師 陳玉怜 小班老師
12/25 Tue	08:10-09:00 09:20 -17:20	大體解剖 大體解剖	***Clinical lecture*** Perineum (I and II) (Lec+ Lab) ***Anal triangle and Urogenital triangle Lab***	***梁金銅*** 呂俊宏
12/26 Wed	13:20-17:20	組織	**第一學期 Exam (Lec+Lab)**	全體教師
12/27 Thu				
12/28 Fri	12:30-17:20	生理	Lab 7-2: 腸道雙醣酶活性實驗&腎臟調控體液的能力	

第十七週－[Uro-genitary and affiliate]

日期	時間	科別	主題	教師
12/31 Mon	調整放假(於 12 月 22 日星期六補上班上課)			
01/01 Tue	開國紀念日(放假日)			
01/02 Wed	13:30–15:10 15:30–17:20	胚胎 大體解剖	**Final Exam** Perineum (III) (Lec + Lab) ***Urogenital triangle Lab***	全體教師 呂俊宏
01/03 Thu				
01/04 Fri				

107 年 12 月 31 日（星期一）調整放假(於 12 月 22 日星期六補上班上課)
108 年 1 月 1 日（星期一）開國紀念日(放假日)
108 年 1 月 4 日（星期五）本學期上課最後一天

第十八週-【期末考週】

日期	時間	科別	主題	教師
01/07 Mon	08:10-12:10 13:20-15:10	大體解剖 小組討論	**Lab review** 解剖、生理小組討論 單元七：胸腔系統（生理、解剖） 學期末老師總結討論	 小班老師
01/08 Tue	08:10-12:10	大體解剖	**Gross Exam : Lec and Lab**	全體教師
01/09 Wed	09:20-12:00	生理	正課、實驗期末考	
01/10 Thu	08:10-10:00 13:20-15:10			
01/11 Fri	08:10-10:00			

備註： 108 年 01 月 07 日（星期一）期末考試開始
108 年 01 月 11 日（星期五）期末考試結束

貳、大體解剖學及實驗上

教學內容：

課程內容融合系統解剖學與局部解剖學。上學期前八週簡單介紹骨骼、肌肉、神經與脈管系統，尤其著重於骨骼系統，配合骨骼標本分組實習；上學期前七週後十週與下學期十五週進行局部解剖之實際操作，包括頭頸、胸腹、骨盆、上肢及下肢。每次實習前由老師就當日實習內容做重點提示與扼要講解。

學分數：4 / 3 學分（上下學期）。

上課時間：2018 年 9 月 11 日至 2019 年 6 月 28 日，每半天為一單元

上午 8:10-12:10 及下午 1:20-5:20(上學期) -6:20(下學期)

Date	Time	Topics	Lab	Lecturer
09-11 Tue-AM	08:10 – 08:40 08:40 – 12:10	**Introduction** (501) Basic terms in Anatomy (501) Skeletal system **I**: Vertebrae and Thoracic cage (501)		李立仁 謝松蒼
09-18 Tue-AM	08:10 – 10:00	**Lab: Skeletal system: Vertebrae and Thoracic cage** (三東)	分發骨箱 (三東實習室) 08:10–10:00	謝松蒼
09-18 Tue-PM	01:20 – 05:20	Skeletal system **II**: Cranial skeleton (501) 大體老師家庭訪視行前輔導 03:30-05:20		謝松蒼 ***蔡詩力***
09-19 Wed-PM	01:20 – 03:10	Lab Cranial skeleton (三東)		
09-25 Tue-PM	01:20 – 05:20	Skeletal system **II**: Facial skeleton (501)	Lab Facial skeleton (三東) 03:30-05:20	謝松蒼
09-26 Wed-PM	01:20 – 05:20	Skeletal system III: Upper limb (501)	Lab Upper limb (三東) 03:30-05:20	謝松蒼
10-01 Mon-AM	10:20 – 12:10	Skeletal system IV: Lower limb (501)		謝松蒼
10-02 Tue-PM	03:30 – 05:20		Lab Lower limb (三東) 03:30-05:20	謝松蒼
10-03 Wed -PM	01:20 – 05:20	Vascular system **I** (501) + **Lab vascular system I**	Lab (三東實習室) 03:30-05:20	陳玉怜
10-08 Mon-AM	08:10 – 12:10	Vascular system **II** (501) + **Lab vascular system II**	Lab (三東實習室) 10:20-12:10	陳玉怜
10-09 Tue-AM	08:10 – 12:10	Muscular system I (501)		李立仁
10-16 Tue-PM	01:20 – 05:20	Muscular system **II** (501)		李立仁
10-17 Wed-PM	03:30 – 05:20		Lab Muscular system (三東)	李立仁
10-23 Tue-AM	09:10 – 12:10	Nervous system **I** (501)		謝松蒼
10-24 Wed-PM	01:20 – 03:10	Nervous system **II** (501)		謝松蒼
10-24 Wed-PM	03:30 – 05:20	**Lab V: Skeletal and Muscular systems and Review** (三東)	Lab (三東實習室) 03:30-05:20	謝松蒼 李立仁
10-29 Mon-AM	08:10 – 12:10	**Midterm Exam: Skeletal, Muscular, Nervous, Vascular system** (**Lec** + **Lab**)		**全體教師**
10-30 Tue-AM	08:10 – 09:50	**Pectoral region and Axilla (I) (Lec) (501)** **Upper limb**	Pectoral region	黃敏銓
10-30 Tue-AM	09:50 – 10:10	針扎割傷處理 Lab safety and skin preparation		葉啟娟
10-30 Tue-AM	10:10 – 11:00 11:00 – 12:10	啟用儀式預演 大體老師啟用儀式		全體教師
10-30Tue-PM	01:20 – 05:20	**Lab orientation** (501) +Pectoral region (Lab)	Pectoral region	黃敏銓

10-31 Wed-PM	01:20 – 05:20	Axilla (Lab)	Axilla	黃敏銓
11-05 Mon-AM	08:10 – 12:10	Arm and cubital region & Superficial back and scapular region (Lec + Lab)	Brachial and Anterior cubital regions Back & Scapular and deltoid regions	黃敏銓
11-06 Tue-AM	08:10 – 12:10	Forearm (I) (Lec + Lab)	Back & Scapular and deltoid regions	黃敏銓
11-06 Tue-PM	01:20 – 05:20	Forearm (II) (Lab)	Forearm	黃敏銓
11-07 Wed–PM	01:20 – 05:20	Hand (Lec + Lab)	Hand	黃敏銓
11-12 Mon–AM	08:10 – 10:00	Joints of shoulder girdle and upper limb (Lec)	Joints of upper limbs	曾國藩
11-12 Mon-AM	10:20 – 12:10	Joints of shoulder girdle and upper limb (Lab)	Joints of upper limbs	曾國藩
11-13 Tue-AM	08:10 – 09:00	***Clinical lecture***		***謝榮賢***
11-13 Tue-AM	09:10 – 12:10	**Lab review**		
11-13 Tue-PM	01:20 – 05:20	Thoracic wall and Lungs **Thorax**	Thoracic wall Pleural cavities and Lungs	李立仁
11-19 Mon-AM	08:10 - 12:10	Middle mediastinum and Heart (I)	Middle mediastinum and Heart	李立仁
11-20 Tue-AM	10:20 - 12:10	Middle mediastinum and Heart (II)	Middle mediastinum and Heart	李立仁
11-26 Mon-AM	10:20 –12:10	Superior and Posterior mediastinum; Joints of thorax	Superior and Posterior mediastinum	李立仁
11-27 Tue-AM	08:10 – 12:10	Anterior abdominal wall (I) **Abdomen**	Anterior abdominal wall	賴逸儒
11-27 Tue-PM	01:20 – 05:20	Anterior abdominal wall (II) and The abdominal cavity (I)		賴逸儒
11-28 Wed-PM	01:20 – 05:20	The abdominal cavity (II)	Abdomino-pelvic cavity in situ	賴逸儒
12-03 Mon-AM	10:20 – 12:10	Detailed examination of abdominal viscera(I)	Detailed examination of abdominal viscera	賴逸儒
12-04 Tue-AM	08:10 – 12:10	Detailed examination of abdominal viscera(II)	Detailed examination of abdominal viscera	賴逸儒
12-11 Tue-AM	09:10 - 12:10	Kidney and Suprarenal gland (Lec+ Lab)	Kidney and Suprarenal gland	賴逸儒
12-17 Mon-AM	08:10 - 12:10	Posterior abdominal wall and Diaphragm (Lec+ Lab)	Posterior abdominal wall and Diaphragm	王淑慧
12-18 Tue-PM	01:20 – 05:20	Gluteal region (Lec+ Lab) **Pelvis & Perineum**	Gluteal region	陳玉怜
12-19 Wed-PM	01:20 – 05:20	Blood vessels, nerves and muscles of pelvis (Lec+ Lab) (I)	Pelvic wall; Scrotum, spermatic cord, and testis	陳玉怜
12-22 Sat-AM	08:10 – 12:10	Blood vessels, nerves and muscles of pelvis (Lec+ Lab) (II) Pelvic viscera (I) (Lec+ Lab)	Pelvic wall; Scrotum, spermatic cord, and testis	陳玉怜
12-24 Mon-AM	09:10 – 12:10	Pelvic viscera (II) (Lec+ Lab)	Pelvic cavity	陳玉怜
12-25 Tue-AM	08:10 – 09:00	***Clinical lecture***		***梁金銅***
12-25 Tue-AM	09:20 – 05:20	Perineum (I and II) (Lec+ Lab)	Anal triangle and Urogenital triangle	呂俊宏
01-02 Wed-PM	03:30 – 05:20	Perineum (III) (Lec + Lab)	Urogenital triangle	呂俊宏
01-07 Mon-AM	08:10 – 12:10	**Lab review**		
01-08 Tue-AM	08:10 – 12:10	**Gross Exam : Lec and Lab**		全體教師

【教科書】Clinically Oriented Anatomy, KL Moore, AF Dalley, and AMR Agur, , Lippincott, Williams & Wilkins

【實習手冊】*****Grant's Dissector, PW Tank, Lippincott Williams & Wilkins

【圖譜】僅供參考: 1. Atlas of Human Anatomy, FH Netter, Novartis

2. Grant's Atlas of Anatomy, AMR Agur and AF Dalley, Lippincott Williams & Wilkins

3. Atlas of Anatomy, PW Tank and TR Gest, Lippincott Williams & Wilkins

【重要日期】大體老師縫皮復原(一東)：2019 年 6 月 24 日至 2019 年 6 月 28 日

課程負責人：李立仁　基礎醫學大樓六樓　分機 88175

助　　教：張銘峰　基礎醫學大樓六樓　分機 62212

教學大綱：

教學大綱：

系統解剖學：

1.題目：Skeletal system (Ⅰ) (Ⅱ)

教學目標：1.Divisions of the skeleton

2.The axia1 skeleton and its locations and main features

講授大綱：1.General features and surface markings of bones

2.Divisions of the skeleton

3.The vertebral column

Curvatures of the vertebral column

A typical vertebra

Cervical vertebrae

Thoracic vertebrae

Lumbar vertebrae

Sacrum and coccyx

4.The thorax

Sternum

Ribs

5.The skull

Suture and fontanels

Bones of the cranium

Paranasal sinuses

Bones of the face

Ossicles of the ear

Hyoid bone

2.題目：Skeletal system (Ⅲ) (IV)

教學目標：1.The appendicular skeleton and its locations and main features

2.Classification of joint

3.Description of some major joints

講授大綱：1.The upper extremities (limbs)

Pectoral girdle

Bones of the arm, forearm, and hand

2.The lower extremities (limbs)

Pelvic girdle and pelvis

Bones of the thigh , leg , and foot

Arches of the foot

3.Classification of joints

Fibrous joints
Cartilaginous joints
Synovial joints
Movement at synovial joints
Types of synovial joints
4.Description of some major joints
Glenohumeral (shoulder) joint
Coxal (hip) joint

3.題目：Muscular System (Ⅰ) (Ⅱ)
教學目標：1.General description of muscles
2.Specific muscles and their function
講授大綱：1.General description
A. How muscles are named
B. Attachment of muscles
C. Architecture of muscles
D. Individual and group action of muscles
E. Lever system and muscle actions
2.Specific muscle groups
A. Muscles of facial expression
B. Muscles that move the eyeball
C. Muscles of mastication
D. Muscles that move the tongue
E. Muscles that move the head and the vertebral column
F. Muscles used in quiet breathing
G. Muscles that support the abdominal wall
H. Muscles that move the shoulder girdle and humerus
I. Muscles that move the elbow and wrist joints
J. Muscles that move the thumb and fingers
K. Muscles that move the femur at hip joint
L. Muscles that act on the knee joint
M. Muscles that move the feet and toes

4.題目：Nervous System
教學目標：1.To study the anatomical organization of the nervous system.
2.To understand the regional anatomy of the central nervous system (I)
3. To understand the regional anatomy of the CNS (II)
4.To understand the anatomical organization of the PNS
5. To understand the general orgainzation of the autonomic nervous system

講授大綱：Central Nervous System (CNS)

- Spinal cord
- Brainstem
  - Medulla oblongata (Myelencephalon)
  - Pons and cerebellum (Metencephalon)
  - Midbrain (Mesenphalon)
- Diencephalon
- Telencephalon Prosencephalon

Peripheral Nervous System (PNS)

- Spinal nerves
  - Sensory ganglia
- Cranial nerves
  - Autonomic ganglia

Autonomic Nervous System (ANS)

- Sympathetic -- thoracolumbar outflow
- Parasympathetic -- craniosacral outflow

Regional Anatomy of the CNS (I)

- Spinal cord
  - External features of the spinal cord
  - Meningeal coverings of the spinal cord
  - Topographical relation of the cord segments to vertebrae
  - Internal structure of the spinal cord
- Brainstem (BS)
  - External features of the BS
  - Internal structure of ths BS
- Cerebellum

Diencephalon

- Subdivisions of the diencephalon
- External features of the diencephalon
- Internal capsule

Cerebrum

- Cerebral topographical of the cerebrum
- Basal ganglia

Cavity of the CNS

- Ventricles
- Canal

Peripheral Nervous System

- Spinal nerves -- 31 pairs
  - Sensory ganglia
- Cranial nerves -- 12 pairs

Autonomic ganglia
General Organization
Sympathetic -- thoracolumbar outflow
Parasympathetic -- cranial outflow
Sympathetic Nervous System
Preganglionic neurons and fibers
Location of postganglionic neurons
Postganglionic fibers
Parasympathetic Nervous System
Cranial part
Sacral part
Parasympathetic nucleus of spinal segments of S2-4
Preganglionic fibers
Postganglionic parasympathetic neurons

5.題目：Cardiovascular System

教學目標：1.To understand the general morphology and structure of the heart
2. To understand the vasculature of the human body

講授大綱：1.Introduction to the cardiovascular system
2.Morphology and structure of the heart
A. Location and size
B. Morphology
C. Wall of the heart and pericardium
D. Cardiac skeleton
E. Heart chambers and valves
F. Blood supply of the heart
G. Conducting system of the heart
H. Nervous control of the heart Types of Blood Vessels
I. Major Arteries and Veins of the Body
J. Lymphatic System

局部解剖學

進度 1：Pectoral Region and Axilla

Relevant skeletal features:-
thoracic cage - sternum; costal cartilages; ribs and thoracic vertebrae;
sternum - manubrium; body; xiphoid process; jugular suprasternal)notch; manubriosternal angle (angle of Louis);
first rib - surfaces; borders; ends;

clavicle - medial end; shaft; lateral end
scapula - surfaces; borders; processes (spine, accomion, coracoid);
humerus - head; greater and lesser tubercles; crests of the greater and lesser tubercles; intertubercular groove; surgical neck.

Subcutaneous structures:-
mammary gland; supraclavicular nerves; anterior and lateral cutaneous branches of intercostal nerves and accompanying arteries; cephalic vein.

Deep fascia:- pectoral; clavipectoral ; axillary.

Muscles:- pectoralis major; obliquus externus abdominis; serratus anterior; pectoralis minor; subclavius; subscapularis; teres major; latissimus dorsi; coracobrachialis; shiort head of biceps; long head of triceps; deltoid.

Boundaries of axilla

Nerves:- roots, trunks, divisions and cords of *brachial plexus.*

Arteries:- axillary artery and its branches.

Veins:- axillary vein and its tributaries.

Lymph nodes:- axillary groups.

Surface anatomy:- axillary artery.

Applied anatomy:- injuries to brachial plexus; lymph drainage of breast.

進度 2：Front of Arm and Cubital Region

Relevant skeletal features:-
humerus-deltoid tuberosity;supracondylar ridges; epicondyles;
radius -head; radial tuberosity;
ulna -coronoid process.

Subcutaneous structures:-
medial cutaneous nerves of arm and forearm; upper and lower lateral cutaneous nerves of arm; lateral and posterior cutaneous nerves of forearm; cephalic, basilic and median cubital veins; cubital lymph nodes.

Deep fascia:- medial and lateral intermuscular septa; (flexor and extensor compartments).

Muscles:- biceps brachii; brachiahs; coracobrachialis; pronator teres; brachioradialis.

Boundafies of cubital fossa

Nerves:- musculocutaneous; ulnar; median; radial.

Arteries:- brachial artery and its branches; radial and ulnar arteries.

Veins:- venae comitantes of brachial artery.

Surface anatomy:- brachial artery.

Applied anatomy:- suitability of antecubital veins for intravenous injections and taking blood for analysis and for transfusion.

進度 3：Superficial Dissection of Back of Trunk, Scapular Region and Back of Arm

Relevant skeletal features:-

skull	- mastoid process; superior nuchal line; external occipital protuberance and crest;
vertebral column	- spines of vertebrae; vertebra prominens C7 (orT 1); sacrum; coccyx;
hip bone	- iliac crest; supracristal plane at the level of L4 spine; posterior superior iliac spine at the level of S2 spine;
scapula	- medial, superior and lateral (axillary) borders; scapular notch; spine of scapula; supra- and infraspinous fossae; spinoglenoid notch; glenoid cavity; infraglenoid tubercle; superior angle at the level of T2 spine; spine of scapula at the level of T3 spine; inferior angle at the level of T7 spine;
humerus	- greater and lesser tubercles; deltoid tuberosity; radial groove;
ulna	- olecranon process.

Subcutaneous structures:-
cutaneous branches of dorsal rami; posterior cutaneous nerve of arm.

Deep fascia:- thoracolumbar fascia.

Ligaments:- ligamentum nuchae; supraspinous ligaments; coraco-acromial ligament; superior transverse scapular ligament.

Muscles:- trapezium; latissimus dorsi; levator scapulae; rhomboideus minor and major; deltoid; supraspinatus; infraspinatus; teres major and minor; inferior belly of omohyoid; subscapularis; serratus anterior; triceps brachii; anconeus.

Boundaries of quadrangular and triangular spaces

Nerves:- accessory; suprascapular; axillary; other nerves supplying muscles.

Arteries:- transverse cervical; suprascapular; circumflex scapular; anastomoses around scapula; posterior circumflex humeral.

Surface anatomy:- axillary nerve; radial nerve.

Applied anatomy:- fracture of the neck of the humerus; fracture of the middle of the shaft of the humerus.

進度 4：Front of Forearm and Hand

Relevant skeletal features:-
humerus - medial epicondyle; medial supracondylar ridge;
radius - surfaces; borders ; styloid process;
ulna - surfaces; borders; styloid process;
carpus - hook of hamate; tubercle of scaphoid; pisiform; tubercle and groove of trapezium;
metacarpus; phalanges.

Subcutaneous structures: -
medial cutaneous nerve of forearm; lateral cutaneous nerve of forearm; palmar cutaneous branch of ulnar nerve; palmar cutaneous branch of median nerve;
digital nerves and vessels; cephalic, basilic and median cubital veins.

Deep fascia:- flexor retinaculum; palmar aponeurosis; fascial septa of the hand.

Ligaments:- superficial and deep transverse metacarpal ligaments.

Muscles:- flexor carpi ulnaris; palmaris longus; flexor carpi radialis; pronator teres;

flexor digitorum superficialis; flexor digitorum profundus; flexor pollicis longus; pronator quadratus; thenar and hypothenar muscles; lumbricals; adductor pollicis; interossei.

synovial sheaths of long flexor tendons

Nerves:- median; ulnar; superficial radial.

Arteries:- radial and ulnar arteries and their branches; superficial and deep palmar arches.

Surface anatomy:- radial and ulnar arteries; median nerve near the wrist.

AppHed anatomy:- Volkmann's ischaemic contracture; Dupuytren's contracture; fascial spaces of hand.

進度 5：Joints of Shoulder Girdle

Sternoclavicular Joint

Relevant skeletal features:-
manubrium; medial end of clavicle; first costal cartilage.

Muscles in relation to capsule of joint: -
pectoralis major; stemomastoid; subclavius.

Capsule:- attachments.

Ligaments:- anterior and posterior sternoclavicular; interclavicular; costoclavicular.

Synovial membrane:- reflection.

Intra-articular structures:- articular disc.

Articular surfaces:- size of sternal and clavicular articular surfaces.

Movements: - gliding; rotation.

Nerve supply:- medial supraclavicular; nerve to subclavius.

Acromioclavicular Joint

Relevant skeletal features:-
lateral end of clavicle; acromion process of scapula.

Muscles in relation to capsule of joint:- trapezius; deltoid.

Capsule:- attachments.

Ligaments:- coracoclavicular.

Synovial membrane:- reflection.

Intra-articular structures:- articular disc sometimes present.

Articular surfaces:- shape.

Movements:- gliding; rotation.

Nerve supply:- suprascapular; lateral pectoral.

Applied anatomy:- dislocation.

Shoulder Joint

Relevant skeletal features:- glenoid cavity; head of humerus.

Muscles in relation to capsule of joint:-
deltoid; rotator cuff muscles; long head of biceps; long head of triceps.

Capsule: - attachments.

Ligaments: - coraco-acromial; coracohumeral; glenohumeral.

Intracapsular structures:- tendon of long head of biceps.

Synovial membrane:- reflection.

Intra-articular structures:- labrum glenoidale.

Articular surfaces:-
humeral and glenoidal articular surfaces; labrum glenoidale.
Movements:- flexion; extension; abduction; adduction; medial and lateral rotation; circumduction.
Nerve supply:- suprascapular; axiuary; lateral pectoral.
Applied anatomy:- dislocation.
Back of Forearm and Hand
Relevant skeletal features:-
radius - posterior surface; dorsal tubercle; styloid process;
ulna - supinator crest; posterior surface; head; styloid process; metacarpus; phalanges.
Subcutaneous structures: -
posterior cutaneous nerve of forearm; superficial branch of radial nerve; dorsal branch of ulnar nerve.
Deep fascia:- extensor retinaculum; (osteofascial compartments).
Muscles:- brachioradialis; extensor carpi radialis longus and brevis; extensor digitorum; extensor digiti minimi; extensor carpi ulnaris; supinator; abductor pollicis longus; extensor pollicis longus; extensor indicis.
Nerves:- deep branch of radial; posterior interosseous.
Arteries:- posterior interosseous; dorsal carpal arch and branches.
Veins:- dorsal venous arch; basilic and cephalic veins.
Applied anatomy:- radial nerve palsy; fracture of lower end of radius (Cofles' fracture).

進度 6：Joints of Free Upper Limb

Elbow Joint
Relevant skeletal features:-
humerus - trochlea; capitulum; radial, coronoid and olecranon fossae;
ulna - trochlear notch; coronoid and olecranon processes;
radius - head; neck; tuberosity.
Muscles in relation to capsule of joint:-brachialis; biceps; triceps; anconeus.
Capsule:- attachments.
Ligaments:- ulnar collateral; radial collateral.
Synovial membrane:- reflection.
Articular surfaces:- shape; carrying angle;
Movements:- flexion; extension.
Nerve supply:- musculocutaneous; radial.
Blood supply:- anastomosis around elbow.
Applied anatomy:- dislocations; fractures.
Proximal and Distal Radio-ulnar Joints
Relevant skeletal features:-
radius - head; ulnar notch.,

ulna - radial notch; head.

Capsule:- attachments.

Ligaments:- annular (proximal joint).

Intra-articular structures:- articular disc (distal joint).

Synovial membrane:- reflection.

Movements:- pronation; supination; axis of movement.

Middle Radio-ulnar Joint

oblique cord; interosseous membrane.

Wrist Joint

Relevant skeletal features:-

distal end of radius; articular disc; scaphoid; lunate; triquetrum.

Capsule:- attachments.

Ligaments:-

palmar radiocarpal and palmar ulnocarpal; dorsal radiocarpal; radial and ulnar collateral.

Synovial membrane:- reflection.

Articular surfaces:- shape.

Movements:- flexion; extension; adduction; abduction; circumduction.

Intercarpal, Midcarpal, Carpometacarpal, Metacarpophalangeal and Interphalangeal Joints

Relevant skeletal features:- carpus; metacarpus; phalanges.

Capsule:- attachments.

Ligaments:- dorsal and palmar; collateral; interosseous.

Synovial membrane:- reflection.

Movements:- flexion, extension (all joints); adduction, abduction (midcarpal joint, metacarpophalangeal joints and carpometacarpal joint of thumb); rotation and circumduction (carpometacarpal joint of thumb).

進度 7：Thoracic Wall and Lungs

Relevant skeletal features:-

thoracic cage - sternum; costal cartilages; ribs; thoracic vertebrae; inlet; outlet;
sternum - manubrium; body; xiphoid process; jugular notch; manubriosternal angle (angle of Louis);
rib - head; neck; tubercle; shaft; angle; costal groove.

typical intercostal space

Subcutaneous structures: -

anterior and lateral cutaneous branches of intercostal nerves.

Muscles:- intercostales (external, internal, innermost).

Nerves:- intercostal.

Arteries:- internal thoracic; anterior and posterior intercostal.

Veins:- internal thoracic; anterior and posterior intercostal.

Pleurae and lungs:- pleural reflection; surfaces and borders of lungs; root of lung; fissures; lobes; bronchopulmonary segments.

Surface anatomy:- surface marking of pleura, lungs and fissures.

Applied anatomy:- auscultation of breath sounds; plain X-ray of chest;bronchogram; bronchoscopy; paracentesis thoracis;bronchopulmonary segments.

進度 8：Superior and Middle Mediastinum

Superior mediastinum and contents:-

thymus; brachiocephalic veins; phrenic and vagus nerves; arch of aorta and branches; trachea; oesophagus.

Middle mediastinum and contents:-

pericardium - fibrous; serous (parietal, visceral); transverse sinus;oblique sinus;
heart - surfaces and borders; coronary arteries; coronary sinus; cardiac veins; chambers; innervation;
great vessels - ascending aorta; pulmonary trunks; superior and inferior venae cavae; primary bronchi.

Surface anatomy:- surface marking of heart and valvular openings.

Applied anatomy:- apex beat; percussion of borders; auscultation of heart sounds; X-ray of chest (pulmonary conus, aortic knuckle); E.C.G.

進度 9：Superior and Posterior Mediastinum and Joints of Thorax

Superior and posterior mediastinum:-

aorta - ascending; arch; descending; branches;
venae cavae - superior; inferior;
trachea - thoracic part; primary bronchi;
oesophagus - thoracic part; constrictions;
nerves - vagus; sympathetic trunk; splanchnic nerves:
nerve plexuses - cardiac; pulmonary; oesopnageal;
veins -posterior intercostal; hemiazygos; accessory hemiazygos; vena azygos;
thoracic duct - course.

Surface anatomy:- arch of aorta; superior vena cava; inferior vena cava; vena azygos; openings in the diaphragm.

Applied anatomy:- barium swallow; oesophagoscopy.

Joints of thorax:-

manubriosternal - secondary cartilaginous type
sternocostal - synovial type except the first sternocostal joint which is a primary cartilaginous joint;
interchondral - synovial type except that between ninth and tenth costal cartilages which is fibrous;
costovertebral - synovial type with double synovial cavities; radiate ligament; intra-articular ligament;
costotransverse - synovial type; superior costotransverse igament;costotransverse ligament; **lateral** costotransverse ligament; *no costotransverse joints for eleventh and twelfth ribs.*

Applied anatomy:- movements of the thoracic cage during respiration.

進度 10：Anterior Abdominal Wall and External Genitalia

Relevant skeletal features:-

thoracic cage - lower part;
vertebral column - lumbar region;
hip bones - pubic symphysis; pubic crest; pubic tubercle; pectineal line; anterior superior iliac spine; iliac crest.

Relevant landmarks: -

linea alba; umbilicus; linea semilunaris; midaxillary line; posterior axillary line.

Subcutaneous structures:-

anterior and lateral cutaneous branches of lower intercostal nerves; subcostal nerve; iliohypogastric nerve; superficial epigastric artery; dartos muscle; fatty and membranous layers of the superficial fascia.

Muscles:- obliquus externus abdominis; obliquus internus abdominis;cremaster muscle; transversus abdominis; rectus abdominis; pyramidalis; *superficial inguinal ring; deep inguinal ring,; rectus sheath.*

Nerves:- muscular branches of lower intercostal; subcostal; iliohypogastric;ilio-inguinal; genitofemoral.

Arteries:- lower posterior intercostal; subcostal; lumbar; superior epigastric; inferior epigastric; deep circumflex iliac.

Veins:- veins accompanying the above arteries.

External genitalia:- male-testes and its coverings; spermatic cord and contents; female - round ligaments.

Surface anatomy:- superficial inguinal ring; deep inguinal ring; inguinal canal.

Applied anatomy:- surgical incisions on the anterior abdominal wall; vasectomy; inguinal hernia; hydrocele; undescended testis.

進度 11：Abdominal Cavity, Stomach and Intestine

Planes of abdomen:- vertical; subcostal; transtubercular; transpyloric.

Regions of abdomen:- epigastric; umbilical; hypogastric; right and left hypochondriac; right and left lumbar; right and left iliac.

Peritoneum:- parietal; visceral; greater sac; lesser sac; foramen of Winslow; median umbilical fold; medial umbilical fold; lateral umbilical fold; falciforrn ligament; left triangular ligament; lesser omentum; greater omentum; gastrosplenic ligament; lienorenal ligament; mesentery; meso-appendix; transverse mesocolon; phrenicocolic ligament.

Viscera:- liver - lower margin; fissure for ligamentum teres; fissure for ligamentum venosum; porta hepatis; caudate lobe;
gallbladder - fundus;
stomach - fundus; body; pyloric part; greater and lesser curvatures; incisura angularis; sulcus intermedius; stomach bed; interior of the stomach; arterial supply; venous drainage; lymphatic rainage; nerve supply;
jejunum and ileum - extent; differences; arterial supply; venous drainage; lymphatic drainage; nerve supply;
appendix - position; arterial supply;
caecum - posterior relations;
colon - ascending; transverse; descending; pelvic; arterial supply; venous drainage; lymphatic drainage; nerve supply.

Portal vein:- formation; location.
Surface anatomy:- fundus of gall bladder; cardiac and pyloric orifices of the stomach; caecum and appendix.
Applied anatomy:- referred pain over the umbilical region and pain over right iliac fossa in appendicitis.

進度 12：Liver, Pancreas, Duodenum and Spleen

Liver:- surfaces and margins; lobes; relations; structures passing through porta hepatis; bare area; common hepatic duct.
Gall bladder:- subdivisions; cystic duct; arterial supply.
Pancreas:- subdivisions; relations; arterial supply; venous drainage; openings of the pancreatic ducts.
Duodenum:- subdivisions; relations; arterial supply; venous drainage; lymphatic drainage; opening of the bile duct.
Spleen:- position; relations.
Portal vein:- formation and its tributaries; portosystemic anastomoses.
Surface anatomy:- liver; gall bladder; common bile duct; duodenum; spleen.
Applied anatomy:- portal obstruction; biliary colic.

進度 13：Kidney, Suprarenal and Posterior Abdominal Wall

Kidney:- coverings; relations; arterial supply; venous drainage; hilum.
Ureter:- course; constrictions; arterial supply; nerve supply.
Suprarenal:- relations; arterial supply; venous drainage.
Posterior Abdominal Wall:-
Muscles:- diaphragm; psoas; quadratus lumborum; transversus abdominis;iliacus.
Nerves:- subcostal; lumbar plexus and branches; sympathetic trunk; coeliac, renal, intermesenteric and hypogastric plexuses.
Arteries:- aorta and branches.
Veins:- subcostal; inferior vena cava and tributaries; azygos.
Lymphatics:- cisterna chyli.
Surface anatomy:- kidney; ureter; spleen; aorta; inferior vena cava.
Applied anatomy:- inferior vena caval obstruction; renal infarction; polycystic kidneys; ureteric colic.

進度 14：Gluteal Region and Posterior Aspect of the Thigh

Relevant skeletal features:-
hip bone - gluteal surface; sciatic notches and foramina; iliac crest, tubercle and spines; ischial spine and tuberosity;
sacrum;
coccyx;

femur - greater trochanter; trochanteric fossa; trochanteric crest; quadrate tubercle; gluteal tuberosity; linea aspera;
tibia - condyles and shaft;
fibula - head.

Subcutaneous structures:- cutaneous nerves.

Muscles:- gluteus maximus, medius, minimus; tensor fasciae latae; piriformis; obturator internus and gemelh; quadratus femoris; hamstring muscles including the ischiocondylar part of adductor magnus.

Nerves:- sciatic nerve and its divisions; inferior gluteal nerve; nerve to quadratus femoris; nerve to obturator internus; pudendal nerve; and superior gluteal nerve.

Arteries:- superior and inferior gluteal arteries; arterial anastomoses.

Surface anatomy:- posterior superior iliac spine; greater trochanter; gluteal fold; sciatic nerve.

Applied anatomy:- site for intramuscular injection.

進度 15：Blood Vessels, Nerves and Muscles of the Pelvis

Arteries:- internal iliac, divisions and branches; median sacral.

Vein:- internal iliac and tributaries.

Nerves:- Sacral plexus; coccygeal plexus; autonomic plexuses.

Muscles:-piriformis; obturator internus; coccygeus; levator ani and its subdivisions; *pelvic diaphragm*

Applied anatomy:- pelvic diaphragm and mechanics of labour.

進度 16：Pelvic Viscera

Relevant skeletal features:-
hip bones - ilium; ischium; pubis;
sacrum - ala; anterior sacral foramina;
coccyx - coccygeal vertebrae; sacrococcygeal articulation;
bony pelvis - inlet; outlet; diameters; ligaments.

Peritoneum:-
male - pelvic mesocolon; rectovesical pouch;
female - pelvic mesocolon; rectouterine pouch; uterovesical pouch; broad ligament of uterus; mesovarium; uterosacral folds.

Rectum:- flexures; ampulla; relations; arterial supply; venous drainage; lymphatic drainage; nerve supply; lateral ligaments; Waldeyer's fascia.

Uterus:- position; subdivisions; cavity; arterial supply; venous drainage; support; transverse cervical ligament; uterosacral ligament; round ligament.

Fallopian tubes:- intramural part; isthmus; ampulla; infundibulum, fimbriae; abdominal ostium.

Ovary:- attachments; relations; arterial supply; venous drainage; nerve supply; ligament of ovary.

Vagina:- fornices; relations.

Urinary bladder:- shape; surfaces; relations in both sexes; arterial supply; venous drainage; nerve supply.

Ureter:- pelvic part - course; termination; arterial supply in both sexes.
Ductus deferens:- course; termination.
Seminal vesicle:- shape; position; duct.
Prostate:- shape; size; position; subdivisions; capsules; prostatic venous plexus; prostatic urethra; openings of ducts.
Surface anatomy:- fundus of the urinary bladder.
Applied anatomy:- prolapse of uterus; prolapse of rectum; enlargement of prostate; spread of cancer from pelvic viscera.

進度 17：Perineum

Ischiorectal fossa:- boundaries;
rectum - sphincters; relations; mucous membrane; arterial supply; venous drainage; portosystemic anastomosis; nerve supply.
Urogenital triangle:- superficial perineal pouch and contents; deep perineal pouch and contents.
Nerves:- pudendal nerve and branches.
Arteries:- internal pudendal artery and branches.
Veins:- internal pudendal vein and tributaries.
Lymphatics:- superficial inguinal lymph nodes.
Surface anatomy:- pudendal canal.
Applied anatomy:- rectal examination; vaginal examination;. pudendal block anaesthesia.

參、組織學上

教學內容：

本課程之授課對象為醫學院之醫學系三年級、牙醫系三年級、解剖學暨細胞生物學研究所及法醫學研究所碩士般一年級學生，上課包括演講一至二小時、實驗二至三小時。課程內容之講授以幻燈片為主，電腦輔助教學教材為輔，介紹人體各組織之基本結構，涵蓋層次包括細胞組織之顯微及超微結構，以及器官系統結構與功能之整合。 實驗課主要利用顯微鏡來觀察組織切片，另有立體模型及顯微與超微相片來輔助教材。每次實驗課前，由老師就當日實驗內容，做十五分鐘之重點提示與扼要講解。實驗課結束前二十分鐘，再由授課老師以電視教學位同學解說當日實驗內容之疑義。

學分數：1 學分

上課教室：501 講堂

課程表：

	日期	時　間	主　　題	任課教師
01	09/10 Mon	8:10-10:00 10:20-12:10	Introduction LM technique EM technique Cell (I) Lab orientation; Microscope check-out (三東) Slide box check-out (三東)	王淑慧 龔秀妮 龔秀妮 黃敏銓 全體教師
02	09/11 Tue	1:20-3:10 3:30-5:20	Cell (II) Epithelial Tissue	黃敏銓 龔秀妮
03	09/12 Wed	1:20-3:10 3:30-5:20	Muscular Tissue ***Muscular Tissue Lab and Epithelial Tissue***	王淑慧 全體教師
04	09/17 Mon	8:10-10:00 10:20-12:10	Connective Tissue ***Connective Tissue Lab***	龔秀妮 全體教師
05	09/25 Tue	8:10-10:00 10:20-12:10	Cartilage & Bone & Bone Formation ***Cartilage & Bone & Bone Formation Lab***	王淑慧 全體教師
06	10/02 Tue	8:10-10:00 10:20-12:10	Blood ***Blood Lab and lab review***	黃敏銓 全體教師
07	10/09 Tue	1:20-3:10 3:30-5:20	Cardiovascular System ***Cardiovascular System Lab***	陳玉怜 全體教師
08	10/15 Mon	8:10-10:00 10:20-12:10	Nervous Tissue (PNS) ***Nervous Tissue (PNS) Lab***	謝松蒼 全體教師
09	10/16 Tue	8:10-10:00 10:20-12:10	Integumentary System ***Integumentary System Lab***	龔秀妮 全體教師
10	10/17 Wed	1:20-3:10	**Quiz (I)**； Lab Review (三東)	全體教師
11	10/22 Mon	8:10-12:10	**Histology Exam (Lec and Lab)**	全體教師
12	10/23 Tue	1:20-3:10 3:30-5:20	Nervous Tissue (CNS) ***Nervous Tissue (CNS) Lab***	謝松蒼 全體教師

13	11/14 Wed	1:20-3:10 3:30-5:20	Respiratory System ***Respiratory System Lab***	陳玉怜 全體教師
14	11/20 Tue	1:20-3:10 3:30-5:20	Lymph Node & Thymus ***Lymph Node & Thymus Lab***	許書豪 全體教師
15	11/21 Wed	1:20-3:10 3:30-5:20	Spleen, Tonsil & Haemopoiesis ***Spleen, Tonsil & Haemopoiesis Lab***	許書豪 全體教師
16	12/04 Tue	1:20-3:10 3:30-5:20	Oral cavity & Teeth ***Oral cavity & Teeth Lab***	錢宗良 全體教師
17	12/05 Wed	1:20-3:10 3:30-5:20	Major salivary gland, Esophagus & Stomach ***Major salivary gland, Esophagus & Stomach Lab***	王淑慧 全體教師
18	12/10 Mon	8:10-10:00 10:20-12:10	Intestine and Pancreas ***Intestine and Pancreas Lab***	陳玉怜 全體教師
19	12/11 Tue	1:20-3:10 3:30-5:20	Liver & Gall Bladder ***Liver & Gall Bladder Lab***	許書豪 全體教師
20	12/12 Wed	1:20-3:10 3:30-5:20	Kidney & Lower Urinary tract ***Kidney & Lower Urinary tract Lab***	陳玉怜 全體教師
21	12/18 Tue	10:20-12:10	**Lab Review (三東)**	全體教師 全體教師
22	12/24 Mon	8:10-09:00	**Quiz(II)**	全體教師
23	12/26 Wed	1:20-3:10 3:30-5:20	第一學期 Exam (Lec+Lab)	全體教師

上課用教課書： **Histology: a text and atlas with correlated cell and molecular biology.** seventh edition, 2016. (最新版) Edited by Michael H. Ross and Wojciech Pawlina
Lippincott Williams & Wilkins

參考用教課書: **Wheater's Functional Histology: a text and colour atlas.** 6th edition. Edited by Barbara Young , Phillip Woodford and Geraldine O'Dowd. 2013. Churchill Livingstone ELSEVIER

實習用教課書: 組織學實驗手冊:台大醫學院解剖學科編著，今名圖書公司經銷。

課程負責人：王淑慧 老師
助　　教：鄭珮容 分機 62212

教學大綱：

組織學教學大綱：

1. 題目：Introduction, LM & EM Techniques

教學目標：Definition of Histology and the Study Methods of Histology

講授大綱：

Definition of Histology

Overview of Methods used in Histology

Histochemistry and Cytochemistry

Light microscopy – preparation of HE stained histology section

Electron microscopy – preparation of thin sections for EM

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 1, pp.1-21

2. 題目：細胞(一)、(二) Cell (I, II)

教學目標：Structure and function of the cell cytoplasm（organelles and inclusions）, cell cycle

講授大綱：

organelles：plasma membrane（cell coat or glycocalyx）, unit membrane, ribosomes, polyribosomes, endoplasmic reticulum（rough and smooth) , Golgi apparatus,lysosomes, peroxisomes, mitochondria, centrioles, microtubules,microfilaments, intermediate filaments.

inclusions：pigment, glycogen, lipids, secretory granules

nucleus：nuclear envelope pore, chromatin, sex chromatin, chromosomes, nucleolus

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY***: A Text and Atlas. 6th ed. Chapter 2 & 3, pp.22-74, & 75-97

3. 題目：上皮組織 Epithelial tissue

教學目標：

1.Four basic tissues：concept and classification

2.Various types of epithelium and examples for each type of epithelium

3.Structure and function of each type of epithelium

4.Surface specialization of epithelial cells

5.Functional significance of various intercellular junctions

講授大綱：

1. Four basic tissues（epithelium, connective tissue, muscluar tissue and nervous tissue）

2. Covering or lining epithelium, glandular epithelium

3. Classification of the epithelium: Simple epithelium and stratified epithelium；squamous, cuboidal and columnar epithelium, pseudostratified and transitional epithelium
4. Cell polarity
5. Surface modification : microvilli, striated borders, brush borders, stereocilia, kinocilia
6. Specialization of intercellular junction : zonula occludens (tight junction), zonula adherens (intermediate junction), macula adherens (desmosomes), gap junctions (nexus) and hemidesmosomes.
7. Basement membrane：basal lamina, reticular lamina
8. Gland

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 4 & 5, pp.98-104, & 105-157

4. 題目：肌肉組織 Muscular tissue

教學目標：

Histological features of three types of muscular tissues

講授大綱：

Epimysium, perimysium, endomysium

Skeletal muscle

White and Red myofibers: multinucleated

Myofibrils--sarcomeres--thin and thick filaments

A band, I band, M line, H band, Z line

Sarcoplasmic reticulum: site of calcium storage

T-tubule: invagination of plasma membrane

Triad, function in muscle contraction

Motor end plates--neuromuscular junction

Satellite cells: muscle regeneration

Cardiac muscle

Myocardium, epicardium, endocardium

Myofibers: single, centrally located nucleus

Myofibrils

Intercalated disc

desmosome-like junction, gap junction

Atrial granules

Conducting system

Smooth muscle

single, ovoid nucleus

no myofibrils (no striation)

myofilaments, dense bodies, intermediate filaments (desmin)

gap junction between cells

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter

11, pp.310-351

5. 題目：血液 Blood

教學目標：

1. Formed elements of blood
2. Structural features of platelets, erythrocytes and leucocytes

講授大綱：

Erythrocytes

Leucocytes

agranulocytes：

1. lymphocytes : T lymphocytes（cell-mediated immune response）
   B lymphocytes（plasma cells；antibody production）
2. monocytes（azurophilic granules；phagocytosis；macrophages）

granulocytes：

1. neutrophils (multilobed nucleus；azurophilic and specific granules)
2. basophils（S or U-shaped nucleus; basophil granules/histamine, haparin, vasodilation）
3. eosinophils(bilobed nucleus；eosinophilic granules/lysosmal enzymes , peroxidase）

Platelets

blood clotting

megakaryocytes

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 10, pp.268-309

6. 題目：結締組織　Connective tissue

教學目標：

1. Struture and function of connective tissue components
2. Classification of connective tissue

講授大綱：

Ground substances（hyaluronic acid, chondroitin sulfate）

Cells

Fibroblasts：collagen production

Mast cells：basophilic granules；metachromasia

Plasma cells：eccentric nucleus, basophilic cytoplasm, antibody production

Leucocytes

Fat cells

Pigment cells

Fibers

Collagenous fiber：collagen

Reticular fiber：reticulin；silver stain

Elastic fiber：elastin；resorcin fuchsin stain

Classification

Embryonic connective tissue

Adult connective tissue proper

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 6, pp.158-197

7. 題目：軟骨與硬骨　Cartilage and Bone

教學目標：

1.Histological features of three types of cartilages

2.Growth and development of cartilages

3.Components of the bone

講授大綱：

Cartilage

Component：chondrocytes（in lacuna）, fibers, ground substance

Types

Hyaline cartilage

Elastic cartilage

Fibrocartilage

Growth

Insterstitial growth

Appositional growth

Perichondrium

Bone

Matrix：organic and inorganic substance

Cells

Osteocytes

Osteoblasts

Osteoclasts：ruffled border；Howship's lacuna

Periosteum, endosteum

Architecture

Spongy bone：trabeculae

Circumferential and interstitial lamellae

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 7 & 8, pp.198-217, & 218-227, 244-247

8. 題目：骨形成　Bone formation

教學目標：

1.Intramambranous and endochondral bone formation

2.Bone remodeling

講授大綱：

Intramembranous bone formation

Mesenchyme--osteoblasts--osteocytes

Bone spicules--bone trabeculae--lamellar bone

Endochondral bone formation

Cartilage model--bone deposition

Invasion of osteogenic buds

Primary ossification centers

Growth in length

Epiphyseal plate：five zones

Zone of resting cartilage

Zone of proliferation

Zone of hypertrophy

Zone of calcification

Zone of cartilage resorption and bone deposition

Bone collar：Intramembranous bone formation

Growth in diameter

appositional growth

selective resorption

Bone remodeling

Internal and external remodeling

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 8, pp.232-243, 248-253

9. 題目：神經組織 （週邊神經組織, PNS）

教學目標：general structure of the neuron

the peripheral nervous system（nerve fibers and ganglions）

講授大綱：

Neurons：perikaryon, dendrites, axon

Nerve fibers：myelin sheath, node of Ranvier Schwann cells

Cranio-spinal ganglia：pseudounipolar neurons, satellite cells

Autonomic ganglia：multipolar neurons

Nerve endings：free and encapsulated endings

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 12, pp.352-399

10. 題目：神經組織 (中樞神經系統) Nervous Tissue, CNS

教學目標：Histological organization of CNS

Light and electron microscopic features of the CNS in general

Neuroglia

Synapses
Meninges
Blood vessels

講授大綱：

Types of neuroglia
White matter, grey matter
Neuropil
Types of synapses
Blood-brain barrier（BBB）
Brain ventricles, ependyma, choroid plexus,
cerebrospinal fluid（CSF）
Meninges（dura, arachnoid, pia）
Relationship of glia, neurons, blood vessels and pia

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed. Chapter 12, pp.352-399

11. 題目：皮膚　Skin

教學目標：

1.Structure of skin and epidermal appendages
2.Keratinizaton

講授大綱：

Structure of thick and thin skin
epidermis, dermis (papillary and reticular layers)
hypodermis (loose connective tissue. Pacinian corpuscles)
Layers of epidermis
stratum basale：cells with basophilic cytoplasm; hemidesmosome
stratum spinosum：desmosomes between cells
tonofilaments, membrane-coating granules
stratum granulosum：keratohyaline granules
stratum lucidum
stratum corneum：soft keratin
Cells of the epidermis
keratinocytes：keratization
melanocytes：melanin granules, DOPA reaction
Langerhans cells
Merkel cells
Hair
hair shaft：cortex, medulla, cuticle
hair follicle：
external connective tissue sheath

epithelial root sheat

outer root sheath, inner root sheath, epidermal germinal matrix

arrector pili of smooth muscle

Glands of the skin

sebaceous glands

sweat glands：small eccrine gland, large apocrine gland, ducts

Nail：nail bed, eponychium, hyponychium

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 15, pp. 488-525

12. 題目：脈管系統　Cardiovascular system

教學目標：

1.Organization of the cardiovascular system

2.Structure of capillaries, arteries and veins.

講授大綱：

1.Capillaries

Continuous or fenestrated endothelium

2.General organization of a blood vessel

Tunica intima, tunica media, tunica adventitia

3.Types of arteries

Elastic arteries : fenestrated elastic membranes

Muscular arteries: internal and external elastic membranes

Small arteries, arterioles

4.Types of veins

Large vein, small to medium veins, venules

valves of veins

5.Heart

Endocardium, myocardium, epicardium

6. Lymphatic vessels

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY***: A Text and Atlas. 6th ed. Chapter 13, pp.400-439

13. 題目：呼吸系統　氣管 肺臟 與上呼吸道 Trachea and Lung, respiratory region, olfactory, Upper respiratory tract

教學目標：

Nasal cavity, paranasal sinuses, pharynx

Larynx, trachea, extrapulmonary bronchi

Structure of conducting and respiratory divisions

Blood supply, lymphatics and nerves

講授大綱：

Nasal cavity：vestibule
region（different epithelial lining and glands）
Nasopharynx：pharyngeal tonsils
Larynx：ventricular and vocal folds
mucosa and walls（cartilages, skeletal muscles）
Intrapulmonary bronchi（lobar, segmental）
Bronchioles（lobular, terminal）
Respiratory bronchioles
Alveolar ducts
Pulmonary alveoli：
epithelium：type I and II cells（pneumocytes）
surfactant
capillary networks in the wall; connective tissue
alveolar pores, dust cells （macrophages）
Blood vessels
pulmonary arteries - alveolar capillaries - pulm. veins
bronchial arteries - bronchopulmonary veins - pulm. veins
bronchial veins – (drain connective tissue in the hilar region）
Lymphatics
Nerves：vagus, sympathetics
Pleura（serous membrane）

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 19, pp.664-697

14. 題目：淋巴節與胸腺 Lymph node and thymus

教學目標：Lymphatic tissue
Thymus
Lymph nodes

講授大綱：

Overview of lymphatic system & lymphatic cells
Reticular tissue; diffuse and nodular lymphatic tissues
Thymus：
epithelial reticular cells, thymocytes
cortex, medulla, Hassall's corpuscles
Blood supply（postcapillary venules）
Lymph node
Cortex：nodules, paracortex, lymph sinuses
Medulla：medullary cords, sinuses
Blood vessels（postcapillary venules）

Filtration of lymph

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 14, pp.440-471, 476-481

15. 題目：脾臟、扁桃腺與血球生成，Spleen, Tonsil and haemopoiesis

教學目標：Structure of the spleen, with special reference to blood filtration

講授大綱：

Spleen

white pulp（lymphatic tissue）

red pulp：splenic cords, venous sinuses

blood vessels：closed and open circulation of blood

Function of spleen

Tonsil: classification, histological features

Haemopoiesis: erythropoiesis, granulopoiesis and megakaryote development

Bone marrow ; Blood cell formation

Bone marrow：

yellow and red bone marrow

hemopoiesis：pluripotent stem cells

development of granulocytes, erythrocytes

platelet formation

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 10 & 14, pp.289-300, 471-474, 482-485

16. 題目：口腔、牙齒　Oral Cavity and Tooth

教學目標：

1. Anatomical parts of a typical tooth
2. Histological structure of a typical tooth
3. Development of the tooth
4. Histology of various regions in oral cavity

講授大綱：

1. Tooth structure - root, neck, crown enamel, enamel prisms, dentin dentinal tubules, Tomes' fibers, pulp & root canal
   cementum & periodontal membrane, gingiva
2. Tooth development - dental lamina, enamel organ (ameloblast, stellate reticulum, stratum intermedium, dentin
   predentin, odontoblasts, sheath of Hertwig
5. Oral cavity - masticatory mucosa, lining mucosa
6. Tongue and specialized epithelium

lingual papillae (filiform, fungiform, vallate and foliate), taste

bud, lingual tonsil

7. Glands of tongue
8. Pharynx -- pharyngeal and palatine tonsil

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 16, pp. 526-545, 556-561

17.題目：唾液腺與食道、胃 Salivary Glands, Esophagus and Stomach

教學目標：

1. Classification of exocrine glands according to complexity and function
2. Histology of salivary gland (major and minor glands)
3. The composition and function of saliva
4. General structural plan of GI tract
5. Histological structure of each layer of GI tract and the possible functional significance of each layer
6. General histology of esophagus
7. General histology of stomach and intestine
8. Structure and functional significance of cell types in the gastric mucosa

講授大綱：

1. Exocrine gland - simple gland
   compound gland
   serous gland, mucous gland, mixed gland,
   serous demilune
2. Salivary glands- parotid, submandibular and sublingual glands
   general histological structure of salivary gland
   secretory unit - serous cells, mucous cells, serous demilune
   myoepithelial cells
   duct system - intercalated duct, striated duct, excretory duct
   saliva - composition and function

3.General structure of GI tract -
   tunica mucosa -- epithelium, lamina propria, muscularis mucosae
   tunica submucosa -- Meissner's nerve plexus
   tunica muscularis externa -- inner circular, outer longitudinal, Auerbach's myenteric nerve plexus
   tunica adventitia -- fibrosa, serosa

4.Esophagus -
   mucosa - str. sq. epi., esophageal cardiac gland, m. mucosae;

submucosa - eosphageal submucosal gland
muscularis externa -- upper 1/3 skeletal m.
middle 1/3 skeletal m. & smooth m.
lower 1/3 smooth m.
adventitia -- fibrosa (above diaphragm)
serosa (below diaphragm)

5.Esophago-cardiac junction -
abrupt change of str. sq. epi. to simple columnar epi.
cardiac gland

6. Stomach:
mucosa -- rugae, gastric pits, glands (cardiac, gastric and pyloric)
gastric gland; chief cells:
parietal cells : intracellular canaliculi HCl, intrinsic factor
mucous neck cells:
enteroendocrine (enterochromaffin) cells: argentaffine cells
submucosa --
muscularis externa -- inner oblique, middle circular and outer longitudinal
serosa

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 16 & 17, pp. 545-555, 562-567, 568-586, 606-613

18. 題目：Intestine and Pancreas

教學目標：

1. Comparison of histology of stomach and various segments of intestine (duodenum, jejunum, ileum, appendix, large intestine and anal canal)
2. Absorption of lipid in intestinal epithelial cells
3. Histology and functions of exocrine and endosrine pancreas

講授大綱：

1. Intestine - organization
mucosa -- intestinal villi;
epithelium (goblet cells, absorptive cells
enteroendocrine cells, M-cells)
lamina propria (central lacteal)
submucosa -- Brunner's gl. (duodenal gland)
Peyer's patch (aggregated lymph nodule)
muscularis externa -- taeniae coli (large intestine)

2. Recto-anal junction, anal canal, anus -
abrupt change of epithelium from simple columnar to str. sq.
anal column, anal sphincters.

3. Exocrine pancreas：

serous acinus, acinar cells, central acinar cells,
intralobular, interlobular and pancreatic ducts

4. Endocrine pancreas：islets of Langerhans
alpha cell -- glucagon; beta cell -- insulin
delta cell -- somatostatin

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 17 & 18, pp. 586-604, 614-627 & 647-655, 662-663

19. 題目：Liver and Gall Bladder

教學目標：

1. Histology and functional significance of the liver
2. Ultrastructure and function of hepatocytes
3. Different concepts of liver lobulation (classic lobule, portal lobule liver acinus)
4. Histology and function of gall bladder

講授大綱：

1. Liver：hepatic lobules, hepatocytes, hepatic plates
Portal triad (hepatic a., portal v., & bile duct)
Blood supply：
portal v. and hepatic a.;
hepatic sinusoid; central v.
sublobular v., collecting v., hepatic v.
Sinusoids：endothelial cells, Kupffer cells,
Space of Disse, reticular fibers, fat-storing cells
Bile canaliculi, cholangioles, bile duct, biliary system.
Hepatic lobulation (portal lobule, acinus, classic lobule) and clinical significance
2. Gallbladder：
highest simple columnar epithelium, no submucosa,
concentration of bile

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 18, pp. 628-647, 656-661

20. 題目：腎臟與泌尿道 Kidney Urinary Tract

教學目標：Histological organization of cortex and medulla, functional correlation between these structures

Urinary tract：urinary bladder, urethra, ureter

Histological organization and types of lining epithelia

講授大綱：

Kidneys

Lobulation, cortical labyrinth, medullary ray

Parts/segments of uriniferous tubules（nephrons, collecting tubules）

Zones and locations（cortex, medulla, lobules, lobes, pyramids）

Nephron：

renal corpuscle（glomerulus, Bowman's capsule, podocytes, mesangial cells, afferent and efferent arterioles）

Tubules:

proximal convoluted tubule（brush border, basal striation）

loop of Henle（thick descending, thin, thick ascending segments）

distal convoluted tubule

Straight tubule

Glomerular filtration barrier: components, function

Urinary bladder, urethra, ureter

Histological organization and types of lining epithelia

Textbook and Atlas : Ross and Pawlina (2011) ***HISTOLOGY*** : A Text and Atlas. 6th ed. Chapter 20, pp. 698-739

肆、生理學甲上

上課時間：週三 1-4 週五 6-9　　地點：基 302　授課對象：醫學系、法醫所

上學期課程：生理學甲上(4 學分)

週次	日 期	星 期	時數	時 間	主　　題	教 師
二	9/19	三				
	9/21	五	4	**13:05-13:20**	Introduction	胡孟君
				13:20-17:20	Ion channels & Membrane excitability	郭鐘金
三	9/26	三				
	9/28	五	4	13:20-17:20	Muscle	郭鐘金
四	10/3	三	3	9:10-12:10	Blood	余佳慧
	10/5	五	4	13:20-17:20	Heart	李宗玄
五	10/10	三			雙十節放假	
	10/12	五	2	13:20-15:10	Heart	李宗玄
			2	15:30-17:20	心臟電生理綜合討論	湯志永
六	10/17	三	2	10:20-12:10	Clinical ECG	蔡佳醍
	10/19	五		13:20-15:10	Lab 1: 動物保定、消防安全與 Chart 軟體介紹	
七	10/24	三	3	9:10-12:10	Circulation	張哲逢
	10/26	五	3	13:20-16:20	Circulation	張哲逢
八	10/31	三	2	9:10-11:10	Circulation	張哲逢
				11:20-12:10	Lab 2: Cardiovascular simulation	張哲逢
	11/2	五		13:20-17:20	Lab 3 : 心電圖描記術&動脈血壓及寒冷檢壓試驗	
九	11/7	三		10:20-12:00	期中考	
	11/9	五		12:30-17:20	Lab 4-1: 影響動脈血壓之諸多因素&神經刺激與肌肉收縮	
十	11/14	三				
	11/16	五		12:30-17:20	Lab 4-2: 影響動脈血壓之諸多因素&神經刺激與肌肉收縮	
十一	11/21	三				
	11/23	五	3	13:20-16:20	Respiration	賴亮全
十二	11/28	三	3	9:10-12:10	Respiration	賴亮全
	11/30	五	1	13:20-14:10	Respiration	賴亮全
				14:20-15:10	Lab 5: 呼吸生理學模擬軟體	賴亮全
十三	12/5	三	3	9:10-12:10	Digestion	余佳慧
	12/7	五		13:20-16:20	Lab 6: 人體呼吸之化學調節	
十四	12/12	三	3	9:10-12:10	Digestion	余佳慧
	12/14	五	4	13:20-17:20	Kidney	林水龍
十五	12/19	三	2	8:10-10:00	Kidney	林水龍
	12/21	五		12:30-17:20	Lab 7-1: 腸道雙醣酶活性實驗&腎臟調控體液的能力	
十六	12/26	三				
	12/28	五		12:30-17:20	Lab 7-2: 腸道雙醣酶活性實驗&腎臟調控體液的能力	

十七	1/2	三				
	1/4	五				
十八	1/9	三		9:20-12:00	正課、實驗期末考	
	1/11	五				

※課程負責老師：胡孟君老師(分機:88239; email: mengchun@ntu.edu.tw)

負責助教：陳怡文(分機:88250; email: ntupy@ntu.edu.tw; office:基醫大樓 1007 室)

※成績計算方式：(1)期中考佔 1/3；期末考佔 1/3(兩次考試總分 200 分，依不同章節的授課時數予以配分)；(2)實驗成績佔 1/3，包括：報告、小考、實驗態度及實驗期末考。

教學大綱：

1.題目：生理學緒論(Introduction)

教學目標：了解生理學的教學目標與修課規定

講授大綱：生理學的教學目標、課程進度、參考書目及修課注意事項。

2.題目：Ion Channels and Membrane Excitability

教學目標：To understand the operation of ion channels and the generation and propagation of a nerve impulse.

講授大綱：

1. Voltage-gated ion channels and their selective permeation for different lions.
2. Ligand-gated ion channels and their selective permeation for different ions.
3. What determines whether a membrane is "excitable" or nonexcitable"?

推薦閱讀資料：

1. Kandel ER et al. (1991) Principles of Neural Sciences 3rd Ed. PP. 66-118
2. Shepherd GM (1994) Neurobiology 3rd Ed. PP. 64-101
3. Zigmond et al. (1999) Fundamental Neuroscience pp. 107-154

3.題目：Ion Channels and Membrane Excitability

教學目標：To understand the functional properties of neuron

講授大綱：

1. Introduction
   a. Definition --- Polarization,Deploarization, Hyperpolarization,Repolarization,etc.
   b. Properties of excitable membrane and elongated cells.
2. Excitation Phenomena in Neuron
   a. Recording methods and instruments.
   b. Threshold & All-or-None law
   c. Events near threshold voltage.
   d. Action Potential --- Definition, Components, Mechanisms, etc.
3. Classification of Nerve Fibers
4. Mechanisms of Nerve Conduction

Selected Readings：

a. Ganong W.F. : The general and cellular basis of medical physiology. In : Ganong WF eds. Review of medical physiology. Los Altos, Calif : Lange Medical Publications, 1997:1-45.

b. Guyton AC : Textbook of medical physiology, 9th ed philadelphia : W.B. Saunders, 1997.

4.題目：Muscle

教學目標：To understand transmitter release and action at the neuromuscular junction

講授大綱：

1. Synthesis of acetylcholine

2. Secretion of acetylcholine
3. The end-plate acetylcholine receptor：structure and function
4. End-plate potentials：genesis, propagation, and action

5.題目：Muscle

教學目標：To understand the mechanisms underlying skeletal muscle contraction and relaxation

講授大綱：

1. Excitation-contraction coupling
2. Myosin, actin, and the essential role of calcium ions
3. The source of energy for muscle contraction
4. Comparison among skeletal, cardiac, and smooth muscles

6. 題目：The Heart

教學目標：(I) To understand the fundamental knowledge of cardiovascular function.

講授大綱：The physiological function of heart, vessels and blood.

(II) To understand rhythmic excitation of the heart

講授大綱：The autorhythmicity of the heart: special excitation & conductive system.

(II) Electrocardiogram (ECG)

講授大綱：The basic principle & characteristics of the normal and abnormal ECG.

7. 題目：The Heart

教學目標：(I) To understand cellular physiology of single cardiac myocytes.

講授大綱：The principal ionic channels in cardiac myocytes and their normal function.

(II) To understand the neural regulation on ionic channels of cardiac myocytes.

8. 題目：The Heart

教學目標：(I) Coronary circulation

講授大綱：(1) To understand the physiological function of coronary circulation

(2) Atherosclerosis

(3) Lipoprotein metabolism

(4) Blood coagulation

9 .題目：Clinical ECG

教學目標：了解正常心電圖及臨床心電圖

講授大綱：

1. 正常心電圖之產生。
2. 心臟肥大之心電圖。
3. 心臟缺氧及心肌梗塞之心電圖。
4. 心律不整之心電圖。

References：

1. Goldshlager and Goldman Textbook of ECG
2. Harrison's Internal Medicine

10.題目：Circulation
教學目標：Hemodynamics
講授大綱：Physical principles of the circulation

11.題目：Circulation
教學目標：1. The Arterial System
2. The Microcirculation and Lymphatic
講授大綱：Arterial dynamics, blood pressure and fluid exchange

12.題目：Circulation
教學目標：The Peripheral Circulation and Its Control
講授大綱：Regulation of vascular function, blood pressure, and blood flow.

13.題目：Circulation
教學目標： 1.Control of Cardiac Output: Coupling of Heart and Blood Vessels
2. Cardiovascular Patterns in Health and Disease
講授大綱：Interaction between heart and circulation, and the pathophysiology of vascular disease

References:

1. Boron, Walter F. and Boulpaep, Emile L. *Medical Physiology*. Elsevier, 2017.
2. Kalbunde, Richard E. *Cardiovascular Physiology Concepts*. Lippincott Williams & Wilkins, 2012.
3. Lilly, Leonard S. *Pathophysiology of Heart Disease*. Lippincott Williams & Wilkins, 2015.
4. Mohrman, David E. and Heller, Lois Jane. *Cardiovascular Physiology*. McGraw-Hill Education, 2018.

14.題目：Blood
教學目標：了解血液中紅血球、白血球、血小板與凝血因子之概況
講授大綱：
1. Blood components
2. Hemostasis and coagulation
3. Hemotopoiesis
4. Functions of erythrocytes, leukocytes and platelets
5. Blood type and blood transfusion

15.題目：胃腸系統生理學 I ----緒論及胃腸運動
教學目標：
(1) 瞭解胃腸系統之一般功能及調節
(2) 胃腸運動機轉
講授大綱：

1. Function of the GI Tract: motility, secretion, digestion, absorption and barrier function.
2. Neural regulation of the GI Motility.
3. Esophageal Motility.
4. Gastric Motility and Gastric Empting.
5. Small and Large Intestinal Motility and Peristalsis.

16.題目：胃腸系統生理學 II---分泌作用

教學目標：瞭解調節胃腸系統分泌作用的機轉

講授大綱：

1. Introduction of GI secretive function.
2. Salivary, Gastric, Pancreatic and Bile Secretion.
3. Regulation of GI secretion: hormone and nerve.

17.題目：胃腸系統生理學 III----消化，吸收及屏障功能

教學目標：瞭解胃腸系統消化及吸收的機轉和屏障能力

講授大綱：

1. Mechanisms of Digestion: protein, carbohydrates, lipids.
2. Mechanisms of Absorption: peptide and amino acid, glucose, fatty acids.
3. Absorption of Water and Minerals.
4. Mucosal Barrier Functions and GI Commensal bacteria.

18.題目：呼吸生理學 I

教學目標：使學生能描述呼吸如何進行及調節以配合身體代謝所需。本單元著重在於認識肺的構造及功能、定義通氣量及灌流量。

講授大綱：

1. 構造與功能
2. 通氣（Ventilation）
3. 灌流（perfusion）
4. 通氣量、灌流量的比值

參考資料：West, JB : Respiratory physiology – the essentials, 9th ed, Philadelphia : Lippincott Williams & Wilkins, 2012.

19.題目：呼吸生理學 II

教學目標：使學生能應用力學解釋呼吸如何進行，熟悉氣體如何在肺泡和肺微血管血液間轉移，及重述氣體如何在血液間運送。

講授大綱：

1. 呼吸靜態力學
2. 呼吸動態力學
3. 擴散（diffusion）
4. 氧及二氧化碳在血液中的運送

20.題目：呼吸生理學 III

教學目標：使學生能描述認識如何調控呼吸及推論呼吸系統如何調節血液中的酸鹼平衡。

講授大綱：

1. 呼吸之神經控制
2. 呼吸之化學控制
3. 酸鹼平衡。
4. 範例:運動及高山上的適應

21.題目：腎臟生理學 I

教學目標：了解腎臟的一般功能及腎臟血流的調節

講授大綱：Historical review of renal function
Elements of renal action
Clearance
GFR
Renal blood flow
Autoregulation

22.題目：腎臟生理學 II & III

教學目標：了解腎小管的功能及腎臟對體液的調節

講授大綱：Handling of filtrate
Tubular function
Handling of water
Countercurrent mechanism
Concentrating urine
Handling of Na^+
Control of fluid volume
Handling of H^+ and HCO_3^-
Renal control of acidity

伍、胚胎學上

教學內容：

此課程規劃為上、下學期各一學分。教授人員主要以解剖學科教授為主，並邀請婦產科及小兒內科教授支援，期以基礎醫學知識加上臨床材料、病例討論，兩者相輔相成，以提升學生學習興趣，對於胚胎的整體發育過程有詳細認識。開宗明義先介紹胚胎學的定義範疇、重要性、歷史背景及命名原則；接著介紹胚胎的發生過程：首先以精卵受精成為配子，發育至器官、系統的形成做一概括性的介紹，同時對胎兒的特徵、胎盤、胎膜及體腔形成的三度空間變化及概念作一系統性的說明，並且闡述胚胎異常發生的可能原因。

學分數： 1 學分（上學期）

上課教室： 501 講堂

	日期	時　間	主　　題	任課教師
01	9/18 Tue	10:20-12:10	Introduction; Bilaminar and trilaminar germ disk	黃敏銓
02	9/19 Wed	15:30-17:20	Embryonic and fetal period	賴逸儒
03	10/1 Mon	8:10-10:00	Placenta and fetal membrane	賴逸儒
04	10/2 Tue	13:20-15:10	Skeletal and muscular system	李立仁
05	10/23 Tue	8:10-9:00	Integumentary system	龔秀妮
06	11/20 Tue	8:10-10:00	Respiratory system	陳玉怜
07	11/26 Mon	8:10-10:00	Cardiovascular system (I)	黃敏銓
08	12/3 Mon	8:10-10:00	Cardiovascular system (II)	黃敏銓
09	12/11 Tue	8:10-9:00	Congenital heart disease	王主科
10	12/18 Tue	8:10-10:00	Digestive System	賴逸儒
11	1/2 Wed	13:30-15:10	Final Exam	全體教師

平常成績 (30%)：出席、隨堂考等。

Final Exam (70%):全部範圍，closed book，時間地點由教務分處統一分配。

Textbook：The Developing Human, 10th Edition, 2015. Clinically Oriented Embryology

Authors: Keith Moore T. V. N. Persaud Mark Torchia

Reference：

Langman's Medical Embryology. T. W. Sadler, 13th ed. 2015, Williams and Wilkins

課程負責人：黃敏銓 教授，分機：88177。

負責助教老師：楊耀華，分機：62212。

1.題目：Ovulation to implantation； Bilaminar and trilaminar germ disk.

教學目標：

(A) Ovulation to implantation

(B) 了解胚胎之二胚層和三胚層形成之過程

講授大綱：

(A)1. Gametogenesis：Chromosomes during mitotic division
Chromosomes during meiotic divisions
Morphological changes during maturation

2. Ovulation to implantation：Ovarian cycle
Ovulation
Fertilization
Cleavage
Uterus at time of implantation

(B)1. Eighth day of development：
Cytotrophoblast
Syncytiotrophoblast（syncytium）
Bilaminar germ disc：Hypoblast
Epiblast

2. Ninth day of development：
Exocoelomic cavity（primitive yolk sac）

3. Eleventh to twelfth days of development：
Uteroplacental circulation
Extraembryonic mesoderm
Extraembryonic coelom（chorionic cavity）

4. Thirteenth day of development：
Primary villi
Secondary（definitive）yolk sac
Exocoelomic cysts
Chorionic plate

5. Abnormal implantation sites and blastocysts

6. Gastrulation：
Formation of embryonic mesoderm and endoderm
Primitive streak
Primitive node
Primitive pit
Invagination

7. Formation of notochord：
Head process
Definitive notochord

8. Growth of germ disc
9. Further development of trophoblast：
Tertiary villi
Anchoring villi
Free（terminal）villi

2.題目：Embryonic and fetal period.

教學目標：了解胎兒的組織，器官及體形的發育。

講授大綱：

(1) Phases of development
(2) Folding of the embryo
(3) Germs layer derivatives
(4) Summary of 4th to 8th weeks
(5) Estimation of fetal age
(6) Highlights of the fetal period
(7) Factors influencing fetal growth
(8) Summary of the fetal period

3.題目：Placenta and Fetal membranes

教學目標：

1. Components of fetal membranes
2. Structure and formation of the placenta
3. Function and circulation of the placenta
4. Fetal membranes in twins

講授大綱：

Development of trophoblast
1. Chorionic plate
2. Extra-embryonic vascular system
3. Intervillous space

Chorion frondosum and decidua basalis
1.Chorion laeve
2.Decidua capsularis，decidua parietalis

Structure of the placenta

Chorion frondosum：fetal portion
1. Decidua basalis：maternal portion
2. Decidua septa
3. Cotyledons

Circulation of the placenta
1. Placental barrier
endothelium of fetal vessels
connective tissue in the villus core
cytotrophoblast layer
syncytium

2. Hemochorial type

Function of the placenta

Amnion and umbilical cord

1. primitive umbilical ring
2. primitive umbilical cord
3. physiological umbilical hernia

Fetal membranes in twins

dizygotic twins，monozygotic twins，conjoined twins

4.題目：Skeletal and muscular system

教學目標：The skeletal system and muscular system

講授大綱：

Ａ. Skeletal system

1. Describe the development of the skull and its abnormalities.
2. Describe the development of the limbs and their abnormalities.
3. Describe the development of the vertebral column and its abnormalities.
4. Describe the development of the ribs.
5. Describe the general skeletal abnormalities.

Ｂ. Muscular system

1. Describe the development of the striated skeletal muscle.
2. Describe the development of the smooth muscle.
3. Describe the development of the cardiac muscle.
4. Describe the muscle abnormalities.

5.題目：Integumentary System

教學目標：To study the normal development of integumentary system.

講授大綱：The development of integumentary system

Epidermis, melanocytes; Dermis, mesenchymal origin;

Sebaceous glands, sweat gland, mammary gland.

6.題目：Respiratory system

教學目標：To study the normal development and congenital malformation of the respiratory system.

講授大綱：

RESPIRATORY SYSTEM

1. Describe the development of the larynx.
2. Describe the development of the trachea, bronchi and lungs
3. Describe the maturation of lungs.

7.題目：Cardiovascular system (Ⅰ) : Part I. The development of the heart

教學目標：Comprehend the origin and development of human heart and the abnormalities due to the abnormal development

講授大綱：

1. Define the origin the heart development.
2. The formation and position of the heart tube
   a) formation of the heart loop
   b) development of sinus venosus
3. The formation of cardiac septa
4. Septum formation in common atrium
5. The septum formation in atrioventricular canal
   Atrioventricular valves
      Abnormalities of the atrial septa
      abnormalities of the atrioventricular canal
6. The septum formation in the ventricles
7. The septum formation in the truncus arteriosus & conus cordis
      Semilunar valves
      Abnormalities of the interventricular septum
      Abnormalities of truncus & conus
8. The formation of the conducting system of the heart

8.題目：Cardiovascular system (II)：Part II. The development of arterial and venous system

教學目標：Comprehend the development of the arterial and venous system

講授大綱：

1. Review the vascular system in the early stage of the embryo and fetus
2. Study the development of the arterial system
   Aortic arches
   Other changes in the arch system
   vitelline & umbilical arteries
   Abnormalities of the arterial system
3. Venous system
   Vitelline veins
   Umbilical veins
   Cardinal veins
   Abnormal venous drainage
   Circulatory changes at birth
   Lymphatic system

9.題目：Congenital Heart Disease

教學目標：Comprehend the types of congenital cardiac defect

講授大綱：

1. fetal cardiac ultrasongraphy
2. introduction to congenital cardiac anomalies: situs anomalies, dextrocardia, septal defect and cornotruncal defects.

10. 題目：Digestive system

教學目標：To study the normal development and congenital malformation of the digestive system.

講授大綱：

DIGESTIVE SYSTEM

1. Define the forgut, midgut and hindgut.
2. Describe the derivatives of the forgut.
3. Describe the derivatives of the midgut with special reference tophysiological herniation.
4. Describe the derivatives of the hindgut.
5. Describe the congenital malformations.