國立台灣大學醫學院
108 學年度學習指引；3-2

大體解剖學及實驗下、組織學下、生理學甲下、胚胎學下神經解剖學

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 109 年 2 月

序

醫學系的教育目標是讓學生在六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 109 年 2 月

目　　錄

壹、醫學系三年級整合課程教學時間表

108 學年度第 2 學期

第一週--[Endocrine system] & [Head & Neck]

日期	時間	科別	主題	教師
03/02 Mon	08:10-08:20	神經解剖	Introduction to the course (10 min)	呂俊宏
	08:20-10:00	神經解剖	Overview of CNS, meninges, and Cerebrospinal fluid	謝松蒼
	10:20-12:10	胚胎	Body cavities and serous membrane	陳玉怜
	13:20-15:10	小組討論	解剖、生理小組討論課(含課前教育) [第一階段] 單元一：血液系統（生理） [第二階段] 單元一：血液系統（生理）	小班老師
03/03 Tue	08:10-10:00	組織	Pineal, Pituitary, Adrenal, Thyroid and Parathyroid	李立仁
	10:20-12:10	組織	***Pituitary, Pineal, Adrenal, Thyroid and***	全體教師
	13:20-17:20	大體解剖	***Parathyroid glands Lab*** Posterior triangle of neck **Head & Neck** ***Posterior cervical triangle Lab***	賴逸儒
03/04 Wed				
03/05 Thu	13:20-16:20	生理	Energy metabolism and homeostasis & The endocrine system	蘇慧敏
03/06 Fri	13:20-16:20	生理	The endocrine system & Hypothalamus-pituitary axis	蘇慧敏

備註：
1. 109 年 3 月 02 日（星期一）本學期上課開始
2. 109 年 4 月 02 日（星期四）兒童節補假(兒童節及民族掃墓節同一日，前一天補假)
3. 109 年 4 月 03 日（星期五）兒童節及民族掃墓節補假
4. 109 年 6 月 15 日（星期一）本學期期末考開始
5. 109 年 6 月 19 日（星期五）本學期期末考結束
6. 109 年 6 月 22 日至 6 月 26 日第 17 週教師彈性補充教學
7. 109 年 6 月 29 日至 7 月 03 日第 18 週教師彈性補充教學
8. 上課內容大綱請至共同教育及教師培訓中心網頁中「學習指引」查閱，
   http://cfd.mc.ntu.edu.tw/zh_tw/Guildline

第二週-- [Nervous system Part1—Structural] & [Reproductive system]

日期	時間	科別	主題	教師
03/09 Mon	08:10-10:00 10:20-12:10 13:20-15:10	神經解剖 神經解剖 小組討論	Spinal Cord Brainstem(I) ： External Morphology & Inner Structure 解剖、生理小組討論課 [第三階段] 單元一：血液系統（生理） [第一階段] 單元二：消化系統（解剖生理）	呂俊宏 李立仁 小班老師
03/10 Tue	08:10-10:00 10:20-12:10 13:20-17:20	組織 組織 大體解剖	Female Reproductive System (I) ***Female Reproductive System (I) Lab*** Anterior triangle of neck and Submandibular region ***Anterior cervical triangle Lab***	王淑慧 全體教師 賴逸儒
03/11 Wed				
03/12 Thu	13:20-16:20	生理	GH & TH & Endocrine regulation of Ca & P metabolism	蘇慧敏
03/13 Fri	13:20-16:20	生理	Endocrine pancreas and adrenal	胡孟君

第三週--[Nervous system Part1—Structural]& [Reproductive system] & [Head & Neck] &[Endocrine system]

日期	時間	科別	主題	教師
03/16 Mon	08:10-10:00	神經解剖	Brainstem (II)：External Morphology & Inner Structure	李立仁
	10:20-12:10	胚胎	Human Birth Defects	黃韻如
	13:20-15:10	小組討論	解剖、生理小組討論課 [第二階段] 單元二：消化系統（解剖生理）	小班老師
03/17 Tue	08:10-12:10	大體解剖	Deep dissection of neck (I) ***Cervical viscera and Root of neck Lab***	賴逸儒
	13:20-15:10	組織	Female Reproductive System (II)	王淑慧
	15:30-17:20	組織	***Female Reproductive System (II) Lab***	全體教師
03/18 Wed				
03/19 Thu	13:20-16:20	生理	Reproduction	胡孟君
03/20 Fri	13:20-16:20	生理	Lab 1：雌鼠性週期	

第四週--[Nervous system Part1—Structural] & [Reproductive system] [Head & Neck]

日期	時間	科別	主題	教師
03/23 Mon	08:10-10:00	神經解剖	Brainstem (III) : External Morphology & Inner Structure	李立仁
	10:20-12:10	胚胎	Common signaling pathways used during development	錢宗良
	13:20-15:10	小組討論	解剖、生理小組討論 [第三階段] 單元二：消化系統（解剖生理） [第一階段] 單元三：心臟血管循環系統（解剖生理）	小班老師
03/24 Tue	08:10-12:10	大體解剖	Deep dissection of neck (II) ***Cervical viscera and Root of neck Lab***	賴逸儒
	13:20-15:10	組織	Male Reproductive System (I)	李立仁
	15:30-17:20	組織	***Male Reproductive System (I) Lab***	全體教師
03/25 Wed				
03/26 Thu	13:20-15:10	生理	Synaptic physiology	湯志永
03/27 Fri	13:20-15:10	生理	Synaptic physiology	湯志永
	15:30-17:20	生理	Lab 2：NIA2 (I)	

第五週--[Nervous system Part1—Structural] & [Reproductive system] & [Head & Neck]

日期	時間	科別	主題	教師
03/30 Mon	08:10-10:00	神經解剖	Cerebellum：External Morphology & Inner structure	錢宗良
	10:20-12:10	神經解剖	Diencephalon：External Morphology & Inner Structure	錢宗良
	13:20-15:10	小組討論	解剖、生理小組討論 [第二階段] 單元三：心臟血管循環系統（解剖生理）	小班老師
03/31 Tue	08:10-09:00	組織	Male Reproductive System (Ⅱ)	李立仁
	09:10-10:00	組織	Ear	林能裕
	11:20-12:10	組織	***Male Reproductive System (Il) Lab***	全體教師
	13:20-17:20	大體解剖	Face and scalp ***Face and scalp Lab***	賴逸儒
04/01 Wed				
04/02 Thu	兒童節(兒童節及民族掃墓節同一日，於前一天補假)			
04/03 Fri	兒童節及民族掃墓節補假			

第六週--[Nervous system Part1—Structural] & [Reproductive system] [Head & Neck] & [Ent & Eye System]

日期	時間	科別	主題	教師
04/06 Mon	08:10-10:00	神經解剖	Telencephalon (I) : External Morphology & Inner Structure	尹相姝
	10:20-12:10	神經解剖	Limbic System	謝松蒼
	13:20-15:10	小組討論	解剖、生理小組討論 [第三階段] 單元三：心臟血管循環系統（解剖生理） [第一階段] 單元四：胸腔系統（解剖）	小班老師
04/07 Tue	08:10-10:00 10:20-12:10	組織 組織	Eye ***Eye & Ear Lab***	林能裕 全體教師
	13:20-14:10 14:20-17:20	大體解剖 大體解剖	***Clinical lecture: Endocrine surgery*** spinal cord ***Spinal cord Lab***	***黃實宏*** 龔秀妮
04/08 Wed				
04/09 Thu	13:20-15:10	生理	Somatic sensory physiology	湯志永
04/10 Fri	13:20-15:10 15:30-17:20	生理 生理	Somatic sensory physiology Lab 3：NIA2 (II)	湯志永

第七週--[Nervous system Part1—Structural]

日期	時間	科別	主題	教師
04/13 Mon	08:10-10:00 10:20-12:10 13:20-15:10	神經解剖 神經解剖 小組討論	Telencephalon (II) : External Morphology & Inner Structure Lab Introduction (501) Gross Anatomy：CNS 解剖、生理小組討論 [第二階段] 單元四：胸腔系統（解剖）	尹相姝 小班老師
04/14 Tue	08:10-09:00 09:10-11:10 11:20-17:20	組織 胚胎 大體解剖	**Quiz** Urogenital system (I) spinal cord ***Spinal cord Lab***	全體教師 呂俊宏 龔秀妮
04/15 Wed				
04/16 Thu	13:20-15:10	生理	Motor physiology	湯志永
04/17 Fri	13:20-15:10	生理	Motor physiology	湯志永

第八週-- [Nervous system Part1—Structural] & [Reproductive system]

日期	時間	科別	主題	教師
04/20 Mon	08:10-10:00 10:20-12:10 13:20-15:10	神經解剖 神經解剖 小組討論	**Midterm (lecture only 3/2~4/13)** Gross Anatomy：brain stem and brain slice(501) 解剖、生理小組討論 [第三階段]單元四：胸腔系統（解剖） [第一階段]單元五：小腦（神經生物） ---職治系跨學系討論	 小班老師
04/21 Tue	08:10-10:00 10:20-12:10 13:20-17:20	胚胎 大體解剖 大體解剖	Urogenital system (II) Cranial cavity (I) ***Removal of skull cap, meninges and brain*** ***Brain and Floor of cranial cavity Lab*** Cranial cavity (II) ***Removal of skull cap, meninges and brain*** ***Brain and Floor of cranial cavity Lab***	呂俊宏 龔秀妮 龔秀妮
04/22 Wed				
04/23 Thu	13:20-15:00	生理	**期中考試**	
04/24 Fri	13:20-17:20	生理	Lab 4：NIA2 (III)	

第九週 -- [Nervous system Part1—Structural] &[Head & Neck]

日期	時間	科別	主題	教師
04/27 Mon	08:10-08:30	神經解剖	quiz -- Gross Anatomy：CNS	
	08:30-10:40	神經解剖	Motor System I : Pyramidal System	曾國藩
	10:50-12:10	神經解剖	Lab III (501) Microscope brain slice： spinal cord ~ inferior colliculus	曾國藩
	13:20-15:10	小組討論	解剖、生理小組討論 [第二階段]單元五：小腦（神經生物） ---職治系跨學系討論	小班老師
04/28 Tue	08:10-12:10	組織	**第二學期 Final Examination (Lec & Lab)**	全體教師
	13:20-15:10	組織	**Microscope check-in, Slide Box check-in (三東)**	
	15:30-17:20	大體解剖	Orbit and Lacrimal apparatus (I) ***Orbit, contents of orbit and eyeball Lab***	王淑慧
04/29 Wed				
04/30 Thu	13:20-15:10	生理	Function of autonomic nervous system	詹智強
05/01 Fri	13:20-15:10	生理	Hypothalamus and motivated behavior	詹智強
	15:30-17:20	生理	Lab 5: Physiology of animal behavior	蘇慧敏

第十週--[Nervous system Part1—Structural] & [Head & Neck]

日期	時間	科別	主題	教師
05/04 Mon	08:10-08:30	神經解剖	quiz –Gross Anatomy：brain stem and brain slice	曾國藩
	08:30-10:40	神經解剖	Motor System II : Extrapyramidal System; Central Control of Visceral Innervation	
	10:50-12:10	神經解剖	Lab IV（三東） Review-- Microscope brain slice：spinal cord ~ inferior colliculus	
	13:20-15:10	小組討論	解剖、生理小組討論 [第三階段]單元五：小腦（神經生物） [第一階段]單元六：內分泌系統（生理）	小班老師
05/05 Tue	08:10-15:10	大體解剖	Orbit and Lacrimal apparatus (II) ***Orbit, contents of orbit and eyeball Lab***	王淑慧
	15:30-17:20	胚胎	Nervous system	謝松蒼
05/06 Wed				
05/07 Thu	13:20-15:10	生理	Emotion and mental disorder	詹智強
05/08 Fri	13:20-15:10	生理	Sex and brain	詹智強
	15:30-17:20	生理	Lab 6: Animal models for neurophysiology	詹智強

第十一週--[Nervous system Part1—Structural] & [Head & Neck]

日期	時間	科別	主題	教師
05/11 Mon	08:10-08:30	神經解剖	quiz -- Microscope brain slice： spinal cord ~ inferior colliculus	
	08:30-10:40	神經解剖	Visual System	呂俊宏
	10:50-12:10	神經解剖	Lab V(三東) Microscope brain slice：superior colliculus ~ thalamus	
	13:20-15:10	小組討論	解剖、生理小組討論 [第二階段]單元六：內分泌系統（生理）	小班老師
05/12 Tue	08:10-12:10	大體解剖	***Gross Exam (Lec+Lab)***	全體教師
	15:30-17:20	大體解剖	Infratemporal region & Temporomandibular joint (I) ***Masseteric & Infratemporal region Lab***	林能裕
05/13 Wed				
05/14 Thu				
05/15 Fri	13:00-14:20	生理	Consciousness and sensori-motor integration	郭鐘金
	14:30-15:50	生理	Consciousness and sensori-motor integration	郭鐘金
	16:00-17:30	生理	Consciousness and sensori-motor integration	郭鐘金

第十二週--[Nervous system Part2—Functional] & [Ent & Eye System] [Head & Neck]

日期	時間	科別	主題	教師
05/18 Mon	08:10-08:30	神經解剖	Quiz-- Microscope brain slice：superior colliculus ~ thalamus	
	08:30-10:40	神經解剖	General and Visceral Sensory Systems	呂俊宏
	10:20-12:10	大體解剖	Infratemporal region & Temporomandibular joint (II) ***Masseteric & Infratemporal region Lab***	林能裕
	13:20-15:10	小組討論	解剖、生理小組討論 英文口頭報告	小班老師
05/19 Tue	08:10-10:00	胚胎	Head and neck：pharyngeal apparatus	婁培人
	10:20-12:10	大體解剖	Pterygopalatine fossa ***Masseteric & Infratemporal region Lab***	林能裕
	13:20-17:20	大體解剖	Pterygopalatine fossa	呂俊宏
05/20 Wed				
05/21 Thu	15:30-17:20	生理	Vision	楊長豪
05/22 Fri	13:20-17:20	生理	Lab 7-1: 複合動作電位&睪丸切除對雄鼠性行為的影響影片教學與小組討論	詹智強

第十三週--[Nervous system Part2—Functional] & [Ent & Eye System] [Head & Neck]

日期	時間	科別	主題	教師
05/25 Mon	08:10-10:00 10:20-12:10 13:20-15:10	神經解剖 神經解剖 小組討論	Auditory and Vestibular Systems Lab VI（三東） Review-- Microscope brain slice：superior colliculus ~ thalamus 解剖、生理小組討論 [第三階段]單元六：內分泌系統（生理） [第一階段]單元七：喉部系統（解剖） ---牙醫系跨學系討論	呂俊宏 謝松蒼 小班老師
05/26 Tue	08:10-12:10 13:20-17:20	大體解剖 大體解剖	Pharynx and Nasal cavity(Ⅰ) ***Pharynx and Bisection of head Lab*** Pharynx and Nasal cavity(Ⅱ) ***Pharynx and Bisection of head Lab***	呂俊宏 呂俊宏
05/27 Wed				
05/28 Thu	13:20-15:10	生理	Olfactory and Gustation	林怡岑
05/29 Fri	13:20-17:20	生理	Lab 7-2: 複合動作電位&睪丸切除對雄鼠性行為的影響影片教學與小組討論	

第十四週--[Nervous system Part2—Functional]& [Ent & Eye System] [Head & Neck]

日期	時間	科別	主題	教師
06/01 Mon	08:10-10:00 10:20-12:10 13:20-15:10	神經解剖 大體解剖 小組討論	Blood Supply of Central Nervous System Oral cavity and Soft palate ***Pharyngeal wall, mouth and tongue Lab*** 解剖、生理小組討論 [第二階段]單元七：喉部系統（解剖） ---牙醫系跨學系討論	 呂俊宏 小班老師
06/02 Tue	08:10-09:00 09:10-12:10 13:20-17:20	大體解剖 大體解剖 大體解剖	***Clinical lecture : Parotid and Temporal Region*** ***Parotid region ; Temporal region Lab*** Larynx ***Larynx Lab*** Ear (I) ***Ear Lab***	***婁培人*** 呂俊宏 呂俊宏
06/03 Wed				
06/04 Thu	13:20-15:10	生理	Equilibrium	楊庭華
06/05 Fri	13:20-17:20	生理	Lab 8-1：不反應期與碰撞現象& 睪丸切除對雄鼠性行為的影響討論、眼球震顫	

第十五週--[Nervous system Part2—Functional]& [Ent & Eye System]
[Head & Neck]

日期	時間	科別	主題	教師
06/08 Mon	08:10-09:00	胚胎	Eyes and ears	林能裕
	13:20-17:20	大體解剖	Ear (Ⅱ) ***Ear Lab***	呂俊宏
	13:20-15:10	小組討論	解剖、生理小組討論 [第三階段] 單元七：喉部系統（解剖） ---牙醫系跨學系討論 **[學期末老師總結討論]**	小班老師
06/09 Tue	08:10-12:10	大體解剖	Anterior and medial regions of thigh ***Anterior and medial regions of thigh Lab***	許書豪
	13:20-17:20	大體解剖	Back of thigh and Popliteal fossa ***Back of thigh and Popliteal fossa Lab***	許書豪
06/10 Wed				
06/11 Thu	13:20-15:10	生理	Hearing	吳振吉
06/12 Fri	13:20-17:20	生理	Lab 8-2：不反應期與碰撞現象& 睪丸切除對雄鼠性行為的影響討論、眼球震顫	

第十六週--[Nervous system Part2—Functional]& [Head & Neck]

日期	時間	科別	主題	教師
06/15 Mon	13:20-12:10 13:20-15:10	大體解剖 小組討論	Lateral and anterior compartments of the leg; Dorsum of foot ***Lateral and anterior compartments of the leg*** ***Dorsum of foot Lab*** 解剖、生理小組討論	許書豪 小班老師
06/16 Tue	08:10-12:10 13:20-16:20 16:30-17:20	大體解剖 大體解剖 大體解剖	Lateral and anterior compartments of the leg; Dorsum of foot ***Lateral and anterior compartments of the leg*** ***Dorsum of foot Lab*** Posterior compartment of the leg; Sole of foot ***Posterior compartment of the leg ;*** ***Sole of foot*** Joints of Lower limb	許書豪 許書豪 許書豪
06/17 Wed				
06/18 Thu				
06/19 Fri	13:20-16:00	生理	期末考試、實驗考試	

第十七週-[教師彈性補充教學]

日期	時間	科別	主題	教師
06/22 Mon	08:10-12:10	神經解剖	**Final Exam ((lecture 3/23~ 6/08 and lab)**	
06/23 Tue	08:10-12:10 13:30-15:00	大體解剖 胚胎	***Gross Exam*** 期末考	全體教師 全體教師
06/24 Wed				
06/25 Thu	端午節放假日			
06/26 Fri	調整放假			

第十八週-[教師彈性補充教學]

日期	時間	科別	主題	教師
06/29 Mon	09:10-12:10	大體解剖	大體老師縫皮教學(一東實習室)	葉啟娟
06/30 Tue				
07/01 Wed				
07/02 Thu				
07/03 Fri				

貳、大體解剖學及實驗下

一百零八學年度大體解剖學課程表(上學期四學分、下學期三學分)

2019 年 9 月 11 日至 2020 年 7 月 04 日，每半天為一單元，上午 8:10-12:10 及下午 1:20-5:20 (全學年)

寒假				
03-03 Tue-PM	01:20 – 05:20	Posterior triangle of neck **Head & Neck**	Posterior cervical triangle	賴逸儒
03-10 Tue-PM	01:20 – 05:20	Anterior triangle of neck and Submandibular region	Anterior cervical triangle	賴逸儒
03-17 Tue-AM	08:10 – 12:10	Deep dissection of neck (I)	Cervical viscera and Root of neck	賴逸儒
03-24 Tue-AM	08:10 – 12:10	Deep dissection of neck (II)	Cervical viscera and Root of neck	賴逸儒
03-31 Tue-PM	01:20 – 05:20	Face and scalp	Face and scalp	賴逸儒
04-07 Tue-PM	01:20 – 02:10	***Clinical lecture: Endocrine surgery***		***黃寶宏***
04-07 Tue-PM	02:20 – 05:20	spinal cord	Spinal cord;	龔秀妮
04-14 Tue-AM	11:20 – 05:20	spinal cord	Spinal cord;	龔秀妮
04-21 Tue-AM	10:20 – 12:10	Cranial cavity (I)	Removal of skull cap, meninges and brain Brain and Floor of cranial cavity	龔秀妮
04-21 Tue-PM	01:20 – 05:20	Cranial cavity (II)	Removal of skull cap, meninges and brain Brain and Floor of cranial cavity	龔秀妮
04-28 Tue- PM	03:30 – 05:20	Orbit and Lacrimal apparatus (I)	Orbit, contents of orbit and eyeball	王淑慧
05-05 Tue- AM	08:10 – 03:10	Orbit and Lacrimal apparatus (II)	Orbit, contents of orbit and eyeball	王淑慧
05-12 Tue-AM	08:10 – 12:10	***Gross Exam (Lec+Lab)***		全體教師
05-12 Tue-PM	01:20 – 05:20	Infratemporal region & Temporomandibular joint (I)	Masseteric & Infratemporal region	林能裕
05-18 Mon-AM	10:20 – 12:10	Infratemporal region & Temporomandibular joint (II)	Masseteric & Infratemporal region	林能裕
05-19 Tue-AM	10:20 – 12:10	Pterygopalatine fossa	Masseteric & Infratemporal region	林能裕
05-19 Tue-PM	13:20 – 17:20	Pterygopalatine fossa		
05-26 Tue-AM	08:10 – 12:10	Pharynx and Nasal cavity (I)	Pharynx and Bisection of head	呂俊宏
05-26 Tue-PM	01:20 – 05:20	Pharynx and Nasal cavity (II)	Pharynx and Bisection of head	呂俊宏
06-01 Mon-AM	10:20 – 12:10	Oral cavity and Soft palate	Pharyngeal wall, mouth and tongue	呂俊宏
06-02 Tue-AM	08:10 – 09:00	***Clinical lecture : Parotid and Temporal region***	Parotid region ; Temporal region	***婁培人***

06-02 Tue-AM	09:10 – 12:10	Larynx	Larynx	呂俊宏
06-02 Tue-PM	01:20 – 05:20	Ear (I)	Ear	呂俊宏
06-08 Mon-AM	09:10 – 12:10	Ear (II)	Ear	呂俊宏
06-09 Tue-AM	08:10 – 12:10	Anterior and medial regions of thigh **Lower limb**	Anterior and medial regions of thigh	許書豪
06-09 Tue-PM	01:20 – 05:20	Back of thigh and Popliteal fossa	Back of thigh and Popliteal fossa	許書豪
06-15 Mon-AM	08:10 – 12:10	Lateral and anterior compartments of the leg; Dorsum of foot	Lateral and anterior compartments of the leg Dorsum of foot	許書豪
06-16 Tue-AM	08:10 – 12:10	Lateral and anterior compartments of the leg; Dorsum of foot	Lateral and anterior compartments of the leg Dorsum of foot	許書豪
06-16 Tue -PM	01:20 – 04:20	Posterior compartment of the leg; Sole of foot	Posterior compartment of the leg ; Sole of foot	許書豪
06-16 Tue -PM	04:30 – 05:20	Joints of Lower limb	Joints of lower limbs	許書豪
06-23 Tue-AM	08:10 – 12:10	***Gross Exam***		全體教師
06-29 Mon-AM	09:10 – 12:10	大體老師縫皮教學(一東實習室)		**葉啟娟**

【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)：2020 年 6 月 29 日至 2020 年 7 月 04 日

課程負責人：王淑慧　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：

進度 1：Posterior Triangle of the Neck

Relevant skeletal features:-
temporal bone - mastoid process;
mandible - angle; lower border; symphysis menti;
sternum - jugular notch;
clavicle - medial end; shaft; lateral end.

Subcutaneous structures:-
platysma muscle; external jugular vein; lesser occipital nerve; great auricular nerve; transverse cutaneous nerve of neck; supraclavicular nerves.

Deep fascia:- investing layer forming roof of posterior triangle; prevertebral fascia; axiliary sheath.

Muscles:- sternomastoid; trapezius; inferior belly of omohyoid; scalenus anterior; scalenus medius; levator scapulae; splenius capitis; semispinalis capitis.

Nerves:- accessory nerve;
brachial plexus: roots; trunks; dorsal scapular; nerve to subclavius; suprascapular; long thoracic; cervical plexus: cutaneous branches; phrenic nerve.

Arteries:- occipital; transverse cervical; suprascapular; subclavian.

Veins:- suprascapular; transverse cervical; anterior jugular; subclavian.

Lymph nodes:- superficial cervical nodes along external jugular vein.

Surface anatomy:- accessory nerve; external jugular vein.

Applied anatomy:- injury to roots and trunks of brachial plexus.

進度 2：Anterior Triangle of the Neck

Relevant skeletal features:-
occipital bone - superior nuchal line;
temporal bone - mastoid process;
mandible - lower border; symphysis menti;
hyoid bone - body; lesser and greater cornua;
thyroid cartilage - thyroid notch; oblique line;
cricoid cartilage - arch;
trachea - cartilaginous rings;
manubrium sterni - jugular notch.

Subcutaneous structures:-
platysma; anterior jugular vein; cervical branch of facial nerve; transverse cutaneous nerve of neck; submental lymph nodes.

Deep fascia:- cervical fascia; investing layer; pretracheal; prevertebral; carotid sheath.

Ligaments:- median thyrohyoid; cricothyroid; cricotracheal.

Glands:- parotid; thyroid; parathyroid.

Trachea:- cervical part.

Oesophagus:- cervical part.

Muscles:- sternomastoid; digastric; mylohyoid; levator glandulae thyroideae; sternohyoid; superior belly of omohyoid; sternothyroid; thyrohyoid; cricothyroid; inferior constrictor of pharynx.

Nerves:- external laryngeal; internal laryngeal; recurrent laryngeal; hypoglossal; ansa cervicalis; vagus; sympathetic trunk.

Arteries:- common carotid; internal carotid; external carotid; superior thyroid; lingual; facial; occipital; posterior auricular; inferior thyroid; thyroidea ima.

Veins:- internal jugular; superior thyroid; middle thyroid; inferior thyroid; brachiocephalic.

Lymph nodes:- anterior cervical; jugulodiagastric; jugulo-omohyoid.

Surface anatomy:- thryoid gland; common carotid artery.

Applied anatomy:- tracheostomy; laryngostomy.

進度 3：Submandibular Region and Deep Dissection of the Neck

Submandibular Region

Relevant skeletal features:-

mandible - lower border; digastric fossa; superior and inferior mental spines;
hyoid bone - body; lesser and greater cornua;
temporal bone - mastoid and styloid processes; mastoid notch.

Ligaments:- stylohyoid ligament.

Submandibudar gland: -surfaces; relations; duct; nerve supply.

Muscles:- digastric; mylohyoid; hyoglossus; genioglossus; geniohyoid; styloglossus; middle and superior constrictors of pharynx.

Nerves:- lingual; inferior alveolar; facial; glossopharyngeal; hypoglossal. *stibmandibular ganglion*

Arteries: - facial; lingual.

Veins:- facial; retromandibular; common facial.

Surface anatomy:- facial artery; submandibular duct.

Applied anatomy:- salivary calculi; veins and lymph nodes in relation to submandibular gland.

進度 4：Deep Dissection of the Neck

Relevant skeletal features:-

cervical vertebrae - transverse processes; foramina trnsversaria;
first rib - neck; shaft; scalene tuberce.

Deep fascia:- prevertebral.

Muscles:- sternomastoid; scalenus anterior; scalenus medius et posterior; rectus capitis anterior; rectus capitis lateralis; longus colli; longus capitis.

Nerves:- glossopharyngeal; vagus; accessory; hypoglossal; sympathetic trunk; cervical plexus.

Arteries:- common carotid; internal carotid; external carotid; subclavian; vertebral.

Veins:- internal jugular; subclavian;brachiocephalic; vertebral.

Lymphatic ducts:- thoracic; right lymphatic.

Surface anatomy:- apex of lung and pleura; carotid arteries; subclavian artery; accessory nerve.

Applied anatomy:- fascial spaces of neck; jugular venous pulse; vertebro- basflar insufficiency; thoracic duct at the root of the neck.

進度 5：Face and Scalp

Face

Relevant skeletal features:-

nasal bone - root of nose;
maxilla - body; processes; infra-orbital foramen;
zygomatic bone - arch; zygomatico-orbital; zygomaticofacial and zygomaticotemporal foramina;
mandible - ramus; angle; body; symphysis; mental foramen.

Subcutaneous structures:-

palpebral branch of lacrimal; infratrochlear; external nasal; infra-orbital; zygomaticofacial; buccal; mental and great auricular nerves.

Muscles:- orbicularis oculi; orbicularis oris; buccinator and other muscles of facial expression.

Nerves:- temporal; zygomatic; buccal; mandibular and cervical branches of facial nerve.

Arteries:- facial; transverse facial; buccal and infra-orbital branches of maxiuary artery.

Veins:- facial and transverse facial veins.

Surface anatomy:- parotid duct; facial artery (pulse).

Applied anatomy:- ‘dangerous area' of face; facial palsy.

Scalp

Relevant skeletal features:-

skull - vault and base;
individual bones - frontal; parietal; temporal; occipital;
sutures - sagittal; coronal; lambdoid;
meeting point of sutures - bregma; lambda; pterion; asterion;
eminence - frontal; parietal;
landmarks - nasion; superior orbital margins; supra-orbital notch; temporal lines; mastoid process; inion; external occipital protuberance; superior nuchal line;
emissary foramina - parietal; mastoid; condylar; etc.

Subcutaneous structures:-

supratrochlear nerve and vessels; supra-orbital nerve and vessels;
zygomaticotemporal nerve; auriculotemporal nerve and superficial temporal vessels; great auricular nerve; lesser occipital nerve; greater occipital nerve and occipital vessels; third occipital nerve; posterior auricular vessels.

Deep fascia:- temporalis fascia.

Muscles:- occipitofrontalis muscle; epicranial aponeurosis.

Nerves:- posterior auricular and temporal branches of facial.

Lymph nodes:- occipital; mastoid.

Applied anatomy:- scalp wounds; 'dangerous area' of scalp.

進度 6：Deep Structures of the Back of the Neck and the Trunk

Deep Dissection of the Back

Relevant skeletal features:-
occipital bone - superior and inferior nuchal lines; foramen magnum;
temporal bone - mastoid process;
vertebral column - atlas; posterior tubercle; posterior arch; transverse processes; axis; odontoid process; spine; vertebral arch; typical vertebra; spinous process; laminae; transverse processes; sacrum; sacral canal; coccyx.

Subcutaneous structures:-
greater occipital nerve; occipital artery.

Deep fascia:- thoracolumbar.

Ligaments:- supraspinous; interspinous; ligaments flava; posterior atlantooccipital membrane.

Muscles:- splenius capitis; semispinalis capitis; rectus capitis posterior major and minor; obliquus capitis superior and inferior; erector spinae.

Nerves:- suboccipital; dorsal rami of spinal nerves.

Arteries:- deep cervical; vertebral.

Veins:- suboccipital plexus.

Surface anatomy:- transverse process of atlas.

Applied anatomy:- cisternal puncture.

Spinal Cord and Meninges

Coverings:- dura mater; archnoid mater; pia mater and its processes.

Spaces:- epidural, containing vertebral venous plexus; subdural, containing lymph; subarachnoid, containing cerebrospinal fluid.

Spinal cord:- anteromedian sulcus; posteromedian fissure; antero- and posterolateral fissures; cervical and lumbar enlargements; conus medullaris.

Spinal nerves:- 31 pairs; rootlets; roots; ganglia; trunk; cauda equina.

Arteries:- anterior and posterior spinal; spinal branches of intersegmental arteries.

Veins:- longitudinal venous channels.

Surface anatomy:- emergence of spinal nerves in relation to the vertebrae; conus medullaris.

Applied anatomy:- lumbar puncture.

Joints of the Skull; Joints of the Vertebral Column; Sacro-iliac Joint

Joints of the skull:- sutural joints between skull bones; primary cartilaginous joint between basisphenoid and basi-occiput; peg and socket joints between teeth and alveolus.

Joints of the vertebral column:-
secondary cartilaginous joints between vertebral bodies; synovial joints between atlas and occiput between odontoid process of axis and atlas; between articular processes of adjacent vertebrae.

Ligaments:- atlanto-occipital membranes; membrana tectoria; cruciate ligament; transverse ligament of atlas; apical; alar.

Sacro-iliac joint:- synovial type.

Ligaments:- ventral, dorsal and interosseous sacro-iliac ligaments; iliolumbar; sacrotuberous; sacrospinous.

進度 7：Cranial Cavity

Relevant skeletal features:- skull - vault; inner and outer tables; dipiöe.

Anterior cranial fossa:-

ethmoid bone - cribriform plate; crista galli;
frontal bone - frontal crest; orbital plates;
sphenoid bone - jugum sphenoidale; lesser. wing; anterior clinoid process;
foramina - olfactory; anterior and posterior ethmoidal; optic canal; foramen caecum.

Middle cranial fossa:-

sphenoid bone - body; sella turcica; dorsum sellae; posterior clinoid process; basisphenoid; groove for cavernous sinus; greater wing;
temporal bone - anterior surface of petrous part; squamous part; groove for posterior branch of middle meningeal artery and vein;
parietal bone - antero-inferior angle; groove for anterior branch of middle meningeal artery and vein;
foramina - superior orbital fissure; foramen rotundum; canaliculus innominatus; foramen lacerum; foramen ovale; foramen spinosum; hiatuses for greater and lesser superficial petrosal nerves.

Posterior cranial fossa:-

temporal bone - posterior surface of petrous part; squamous part; mastoid part; groove for sigmoid sinus;
occipital bone - groove for superior sagittal sinus; internal occipital protuberance; internal occipital crest; groove for transverse sinus;
parietal bone - postero-inferior angle; groove for sigmoid sinus;
foramina - internal acoustic meatus; jugular foramen; hypoglossal canal; foramen magnum.

Dural folds:- falx cerebri; falx cerebeui; tentorium cerebella; diaphragms sellae; cavum trigeminale.

Dural venous sinuses:- superior sagittal sinus; inferior sagittal sinus; straight sinus; occipital sinus; sphenoparietal sinus; cavernous sinus; superior petrosal sinus; inferior petrosal sinus; transverse sinus; sigmoid sinus.

Emissary foramina:- foramen caecum; emissary sphenoidal foramen; parietal foramen; mastoid foramen; condylar canal.

Cranial nerves:- olfactory; optic; oculomotor; trochlear; trigeminal; abducent; facial; nervus intermedius; vestibulocochlear; glossopharyngeal; vagus; accessory; hypoglossal.

Arteries:- middle meningeal (extradural); internal carotid and branches.

Surface anatomy:- middle meningeal artery.

Applied anatomy:- subdural and extradural haemorrhage; fractures of base of skull.

進度 8：Orbit and Lacrimal Apparatus

Relevant skeletal features: -

bony orbit - axis;
medial wall - frontal process of the maxilla; lacrimal; orbital plate of' the ethmoid; body of the sphenoid;
floor - zygomatic; maxilla; orbital process of the palatine;
lateral wall - zygomatic; greater wing of the sphenoid;
roof - orbital plate of the frontal; lesser wing of the sphenoid;
openings - optic canal; superior orbital fissure; inferior orbital fissure; infra- orbital foramen; supra-orbital notch or foramen; nasolacrimal canal;
anterior ethmoidal foramen; posterior ethmoidal foramen;
zygomatico-orbital foramen.
fossa for lacrimal gland; Whitnall's tubercle

Fascia bulbi:- check ligaments; suspensory ligament.

Extra-ocular muscles:- levator palpebrae superioris; superior rectus; inferior rectus; medial rectus; lateral rectus; superior oblique; inferior oblique.

Nerves:- optic; ophthalmic division of trigeminal; oculomotor; trochlear; abducent; zygomatic; infra-orbital.
Ciliary ganglion

Arteries:- ophthalmic artery and its branches.

Veins:- superior and inferior ophthalmic.

Lacrimal apparatus:- lacrimal gland; lacrimal ducts; conjunctival sac; lacus lacrimalis; lacrimal papilla; lacrimal punctum; lacrimal canaliculus; lacrimal sac; nasolacrimal duct; nasolacrimal fold.

Surface anatomy:- supra- and infra-orbital foramina.

Appfied anatomy:- spread of infection to cavernous sinus; occlusion of central artery of retina; lesions of ocular motor nerves.

進度 9：Parotid and Infratemporal Regions and Temporomandibular Joint

Parotid and Infratemporal Regions

Relevant skeletal features:-

mandible - body; mylohyoid line and groove; mental foramen; angle; ramus; condylar process (head); neck; pterygoid fovea; coronoid process; mandibular notch; lingula; mandibular foramen;
temporal bone - squamous; petromastoid; tympanic plate; styloid process; zygomatic process; external acoustic meatus; mastoid process; stylomastoid foramen; squamotympanic and petrotympanic fissures; mandibular fossa; articular tubercle; postglenoid tubercle;
sphenoid bone - greater wing; infratemporal crest; lateral and medial pterygoid plates; scaphoid fossa; spine; foramen ovale; foramen spinosum; emissary sphenoidal foramen;
maxilla - tuberosity; posterior surface.
Pterygomaxillary fissure; pterygopalatine fossa

Deep fascia:- capsule of parotid gland.
Ligatnents:- stylomandibular; sphenomandibular.
Parotid gland:- surfaces and relations; duct; facial nerve and branches; retro-mandibular vein; external carotid artery; lymph nodes; nerve supply of the gland.
Muscles:- masseter; temporalis; pterygoids.
Nerves:- mandibular and branches; chorda tympani; maxillary and branches.
Arteries:- maxillary artery and branches.
Veins:- pterygoid plexus.
Surface anatomy:- parotid duct.
Applied anatomy:- facial palsy; parotid infections.
Temporomandibular Joint
Muscles in relation to capsule:- lateral pterygoid.
Capsule:- attachments.
Ligaments:- lateral ligament.
Accessory ligaments:- sphenomandibular; stylomandibular.
Intra-articular structures:- articular disc.
Synovial membrane:- reflection.
Movements:- protraction; retraction; elevation; depression; side to side movements.
Nerve supply:- auriculotemporal; masseteric.
Blood supply:- superficial temporal artery.
Applied anatomy:- dislocation.

進度 10：Nasal Cavities

Relevant skeletal features:-

floor	- palatine processes of maxilla; horizontal plates of palatine bones;
lateral wall	- frontal process of maxilla; vertical plate of palatine bone; inferior choncha (turbinate); middle and superior chonchae;
roof	- nasal bone; cribriforin plate of ethmoid bone; body of sphenoid;
nasal septum	- vomer; perpendicular plate of ethmoid; septal cartilage;
foramen and canal	- incisive foramen; greater palatine foramen and canal; sphenopalatine (pterygopalatine) foramen; pterygoid canal.

Lateral wall:- choncha (superior, middle and inferior); meatus (superior, middle and inferior); vestibule; atrium; hiatus semilunaris; ethmoid bulla; frontal nasal duct.
Paranasal sinuses:- frontal sinus; maxillary sinus; ethmoid cells (sinus); openings of sinuses.
Arteries:- maxillary artery; sphenopalatine artery; posterior septal branch; greater palatine artery.
Nerves:- anterior ethmoidal nerve; nasopalatine nerve; greater palatine nerve; pterygopalatine (sphenopalatine) ganglion; nerve of pterygoid canal (Vidian nerve).
Pterygopalatine fossa:-
Applied anatomy:- epistaxis

進度 11：Oral Cavity

Vestibule of mouth:- mentalis; inferior border of zygomatic arch; maxilla; ramus and coronoid process of mandible; tendon of temporalis; masseter; frenulum; orifice of parotid duct.

Oral cavity proper:-
sublingual region; frenultun linguae; deep lingual veins; opening of submandibular duct; plica sublingualis; hainulus of medial pterygoid plate; palatine tonsil; sulcus limitans; vallecula.

Sublingual region:- mylohyoid line; sublingual fossa.

Muscles:- mylohyoid; geniohyoid; genioglossus.

Glands:- sublingual gland and its duct; submandibular gland and its duct.

Nerves and ganglion:- lingual nerve; hypoglossal nerve; submandibular ganglion.

Tongue:- styloglossus; genioglossus; geniohyoid; intrinsic musculature; lingual artery; hypoglossal nerve.

進度 12：Soft Palate and Pharynx

Pharyngeal wall:- buccopharyngeal fascia; pharyngeal muscles; pharygobasilar fascia; mucous membrane.

Muscles:- superior, middle and inferior constrictors; tensor veli palatini; levator veli palatini.

Pharyngeal orifice of auditory tube:- torus tubarius.

Pharyngeal tonsil (adenoids):-

Palatine tonsil:- uvula; palatoglossal arch; palatopharyngeal arch; palatine tonsil; palatoglossus and palatopharyngeal muscles.

Nerves:- lesser palatine nerves.

Arteries:- descending palatine artery.

進度 13：Larynx

Cartilages:-

Muscles:- posterior cricoarytenoid; lateral cricoarytenoid; transverse arytenoid; oblique arytenoid; cricothyroid; thyroarytenoid; vocalis; vocal process of arytenoid.

Membranes and ligaments:-
thyrohyoid membrane; thyrohyoid ligament; cricothyroid ligament; vocal ligament; quadrangular membrane.

Cavities:- vestibule; ventricle; infraglottic cavity; vestibular fold; vocal fold; rima glottides.

Sensory nerves:- internal laryngeal nerve.

進度 14：Eye

Chief structures:- sclera; cornea; choroid; ciliary body; iris; optic papilla or disc.

進度 15：Ear

Relevant skeletal features:-
mastoid process; external acoustic meatus; supratneatal spine; internal acoustic meatus; hiatus for greater petrosal nerve; tegrnen tympani; jugular fossa; bony portion of auditory tube; carotid canal; stylomastoid foramen.

Chief structures:- tympanic membrane; epitympanic recess; aditus; air cells of mastoid process; carotid canal; jugular fossa; tegmen tympani; stapes; malleus; incus.

Nerves:- facial nerve.

進度 16：Anterior and Medial Aspects of the Thigh

Relevant skeletal features:-
hip bone - pubic tubercle; anterior superior iliac spine; iliac crest; tubercle of iliac crest;
femur - head; neck; greater and lesser trochanters; linea aspera; condyles; epicondyles; adductor tubercle; supracondylar ridges; patella;
tibia - condyles; tibia tuberosity.

Subcutaneous structures:-
great saphenous vein, its tributaries with accompanying arterial branches; lateral, intermediate and medial cutaneous nerves of thigh; femoral branch of genitofemoral nerve; saphenous nerve; superficial inguinal lymph nodes.

Deep fascia:- fascia lata; iliotibial tract; intermuscular septa; compartments of the thigh.

Muscles:- sartorius; ilio-psoas; quadriceps femoris; pectineus; adductors.

Boundaries of femoral triangle and adductor (subsartorial) canal

Nerves:- femoral and obturator nerves and their branches.

Arteries:- femoral artery and its branches.

Veins:- femoral vein and its tributaries.

Deep lymph nodes:- deep inguinal nodes.

Surface anatomy:- femoral artery.

Applied anatomy:- injury to femoral artery; disuse atrophy of extensors;femoral hernia

進度 17：Anterior and Lateral Aspects of the Leg and Dorsum of the Foot

Relevant skeletal features:-
tibia - borders and surfaces;
fibula - borders and surfaces;
bones of foot - tarsus; metatarsus; phalanges.

Subcutaneous structures:-

superficial peroneal nerve; lateral cutaneous nerve of calf; saphenous nerve; sural nerve; deep peroneal nerve; great saphenous vein; small saphenous vein.

Deep fascia:- osteofascial compartments; extensor retinacula; peroneal retinacula.

Muscles:- peroneus longus; peroneus brevis; tibialis anterior; extensor hallucis longus; extensor digitorum longus; peroneus tertius; extensor digitorum brevis.

Nerves:- superficial peroneal nerve; deep peroneal nerve.

Arteries:- anterior tibial artery; dorsahs pedis.

Applied anatomy:- dorsalis pedis arterial pulse; intravenous infusion into great saphenous vein.

Knee Joint

Relevant skeletal features:-

femur - articular areas for tibia and patella; intercondylar notch;
patella - subdivision of articular surface;
tibia - condylar articular area; intercondylar eminence and tubercles; tibial tubercle.

Muscles in relation to capsule of joint:-

quadriceps; sartorius; gracilis; sen-litendinosus; semimembranosus; adductor magnus; gas.trocnen-lius; popliteus; peroneus longus.

Capsule:- attachments.

Ligaments:- medial, lateral; oblique popliteal.

Intra-articular structures:- cruciate ligaments; menisci; popliteus tendon.

Synovial membrane:-reflection; inftapaterar and alar folds; suprapatellar bursa.

Articular surfaces:- articular cartilage.

Movements:- flexion; extension and rotation; 'locking' and 'unlocking'.

Nerve supply:- genicular nerves.

Blood supply:- genicular arteries.

Applied anatomy:- internal derangements.

進度 18：Sole of Foot

Relevant skeletal features:-

calcaneus - medial and lateral processes of tuber calcaneus; sustentaculum tali; talus;
navicular - tuberosity;
cuboid - groove for peroneus longus tendon;
fifth metatarsal bone - styloid process (tuberosity).

Subcutaneous structures:-

medial calcanean nerves and vessels; digital nerves and vessels.

Deep fascia:- plantar aponeurosis; intermuscudar septa; muscular compartments.

Muscles:- first layer - abductor hallucis; flexor digitorum brevis; abductor digiti minimi;
second layer- flexor hallucis longus and flexor digitorum longus tendons, lumbricals and flexor accessorius;
third layer- flexor hallucis brevis; adductor hallucis; flexor digiti minin brevis;
fourth layer - tibialis posterior and peroneus longus tendons; interossei.

Ligaments:- long plantar ligament; spring ligament.

Nerves:- medial plantar; lateral plantar.

Arteries:- medial plantar artery; lateral. plantar artery; plantar arterial arch.

進度 19：Hip Joint

Relevant skeletal features:-
acetabulum - developmental components;
head of femur.

Muscles in immediate relation to capsule of joint:-
iliopsoas; pectineus; obturator externus; short lateral rotators; gluteus minimus; reflected head of rectus femoris.

Capsule:- attachments.

Thickenings of capstde:- iliofemoral, pubofemoral, and iscmofemoral ligaments; retinacular fibres.

Intra-articular structures:- ligamentumteres.

Synovial membrane:- reflection; retinacular vessels.

Articular surfaces:- articular cartilage; labrum acetabulare; transverse ligament.

Movements:- flexion; extension; abduction; adduction; medial and lateral rotation; circumduction.

Nerve supply:- application of Hilton's law.

Blood supply:- to joint and to head of femur.

Applied anatomy:- dislocation of hip; fractures of femoral neck.

Popliteal Fossa and Back of the Leg

Relevant skeletal features:-
femur - popliteal surface; condyles;
tibia - condyles; upper end of medial surface; posterior surface; soleal line; medial malleolus;
flbulda - posterior surface; lateral malleolus;
calcaneus - attachment of flexor retinaculum.

Subcutaneous structures:-
posterior femoral cutaneous nerve; sural nerve; peroneal communicating nerve; saphenous nerve; medial calcanean branches of tibial nerve; small saphenous vein.

Deep fascia:- osteofascial compartments; transverse septum; flexor retinaculum.

Muscles:- semitendinosus; semimembranosus; biceps femoris; gastrocnemius; plantaris; soleus; popliteus.

Boundaiies of popliteal fossa

flexor digitorum longus; flexor hallucis longus; tibialis posterior.

Nerves:- sciatic nerve; tibial nerve; common peroneal nerve.

Arteries:- popliteal; posterior tibial; anterior tibial; peroneal.

Veins:- popliteal vein and its formation.

Lymph nodes:- popliteal.

Surface anatomy:- popliteal artery; posterior tibial artery.

Applied anatomy:- recording of blood pressure in the lower limb.

進度 20：Ankle Joint

Relevant skeletal features:-lower end of tibia and fibula; talus.

Muscles in immediate relation to capsule of joint:-

tibialis anterior; extensor hallucis longus; extensor digitorum longus; peroneus tertius; peroneus brevis; peroneus longus; tibialis posterior; flexor digitorum longus; flexor hallucis longus; tendo calcaneus.

Capsule:- attachments.

Ligaments:- deltoid ligament; lateral ligament.

Synovial membrane:- reflection.

Articular surfaces:- tibiofibular mortise; posterior tibiofibular ligament;trochlear and malleolar surfaces of talus.

Movements:- dorsi flexion; plantar flexion; side to side movement in plantar flexion.

Applied anatomy:- sprains; avulsion of medial malleolus; Pott's fracture.

Subtalar, Midtarsal and other Joints

Relevant skeletal features:-bones of foot; arches of foot.

Capsule:- attachments.

Ligaments:- spring ligament; short and long plantar ligaments; deep transverse metatarsal ligaments.

Synovial membranes:- reflection.

Articular surfaces:- between talus and calcaneus; talus and navicular; calcaneus and cuboid.

Movements:- inversion and eversion at subtalar and midtarsal joints; movements at other joints.

Muscles concerned in movements:- investors and evertors; flexors and extensors.

Applied anatomy:- club foot.

參、組織學下

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	3/3 Tue	8:10-10:00 10:20-12:10	Pineal, Pituitary, Adrenal, Thyroid and Parathyroid ***Pituitary, Pineal, Adrenal, Thyroid and Parathyroid glands Lab***	李立仁 全體教師
02	3/10 Tue	8:10-10:00 10:20-12:10	Female Reproductive System (I) ***Female Reproductive System (I) Lab***	王淑慧 全體教師
03	3/17 Tue	1:20-3:10 3:30-5:20	Female Reproductive System (II) ***Female Reproductive System (II) Lab***	王淑慧 全體教師
04	3/24 Tue	1:20-3:10 3:30-5:20	Male Reproductive System (I) ***Male Reproductive System (I) Lab***	李立仁 全體教師
05	3/31 Tue	8:10-09:00 09:10-10:00 10:20-12:10	Male Reproductive System (Il) Ear ***Male Reproductive System (Il) Lab***	李立仁 林能裕 全體教師
06	4/7 Tue	8:10-10:00 10:20-12:10	Eye ***Eye & Ear Lab***	林能裕 全體教師
07	4/14 Tue	8:10-09:00	**Quiz**	全體教師
08	4/28 Tue	8:10-12:10 1:20-3:10	**第二學期 Final Examination (Lec & Lab)** **Microscope check-in, Slide Box check-in (三東)**	全體教師

上課用教課書： **Histology: a text and atlas with correlated cell and molecular biology.**
8th edition, 2019. (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：龔秀妮 老師
助　　教：鄭珮容 分機 62212

教學大綱：

1.題目：**內分泌系統 腦下腺、松果腺、腎上腺、甲狀腺與副甲狀腺 Pituitary, Pineal Adrenal, Thyroid, and Parathyroid glands**

教學目標：Structure and function of pituitary, pineal, thyroid, parathyroid and adrenal glands

講授大綱：

- Pituitary
  - Adenohypophysis
    - Pars distalis, pars intermedia, pars tuberalis
    - Cells
      - Acidophils：somatotrophs, mammotrophs
      - Basophils：thyrotrophs, gonadotrophs corticotrophs
      - Chromophobes：follicular cells, degranulated cells
    - Sinusoids
    - Hypophyseal portal system
  - Neurohypophysis：pituicytes, Herring bodies Hypothalamo-hypophyseal tract
- Pineal gland
  - pinealocytes, glial cells, brain sand, function of pineal gland
- Thyroid gland
  - Thyroid follicles
    - Follicular cells：thyroid hormones
  - Parafollicular cells：argyrophil granules/calcitonin
- Parathyroid gland
  - Principal cells：parathyroid hormone
  - Oxyphil cells
- Adrenal gland
  - Cortex
    - Zona glomerulosa: aldosterone
    - Zona fasciculata: glucocorticoid
    - Zone reticularis
  - Medulla
    - ganglion cells, chromaffin cells
  - Blood supply

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed. Chapter 21, pp. 686-699, 716-721

2.題目：男性生殖系統(一) Male reproductive system Ⅰ

教學目標：

Testis, epididymis

講授大綱：

Testis：

Function (a) production of sepermatozoa (b) secretion of androgens

(a) seminiferous tubules（Sertoli cells, spermatogenic cells, mitosis and meiosis）

(b) interstitial cells of Leydig（endocrine cells）

Excretory ducts：straight tubules, rete testis, efferent ductules, ductus epididymis, ductus deferens, ejaculatory ducts

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed. Chapter 22, pp. 728-751

3.題目：男性生殖系統(二) Male reproductive system Ⅱ

教學目標：

Structures of accessory sex glands（prostate, seminal vesicles, bulbourethral gland）

Penis, scrotum

教學大綱：

Accessory glands：

Prostate（compound tubuloalveolar glands, corpora amylacea）

Seminal vesicles store the fluid secreted by the lining epithelial cells

Bulbo-urethral glands（Cowper's glands）

Penis：thin skin, tunical albuginea, corporal cavernosa, corpus spongiosum, cavernous spaces（blood lacunae）, trabeculae, penile urethra, glans penis

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed. Chapter 22, pp.752-759

4.題目：Ear and Eye

教學目標：

Histological organization of eye in general, retina--light and electron microscopic features, accessory structure of the eye--eyelid and lacrimal gland

Organ of Corti -- light and electron microscopic features : vestibule apparatus cochlea

Vestibular Apparatus

講授大綱：

Eye Ball:

Tunica fibrosa fulbi -- cornea and sclera

Tunica vasculosa -- choroid, ciliary process, iris

Tunica interna -- retina (pars optica and pars caeca)

Content - lens, vitrous body, aqueous humor

Acessory structures -- eyelids and lacrimal gland

Ear:

External ear -- auricle, external acoustic meatus, tympanic membrane

Middle ear -- tympanic cavity, Eustachian tube, tympanic antrum, auditory ossicles

Inner ear -- osseous labyrinth

semicircular canals, vestibule, cochelea

membrane labyrinth

semi-circular duct, utricle and saccule, cochlear duct

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed.
Chapter 24 & 25, pp. 834-887

5.題目：女性生殖系統(一) Female reproductive system I

教學目標： Structures of ovary, uterine tube and mammary gland

講授大綱：

Ovary：

Development and maturation of ovarian follicles and ovulation

Ovarian follicles：primordial f., growing f. mature or Graafian f.（oocyte, zona pellucida, follicular epithelium, membrana granulosa, cumulus oophorus, theca folliculi）

Formation and involution of corpus luteum and corpus albicans

Atresia of follicles

Formation and function of coupus luteum

Formation of corpus albicans

Secretion of female sex hormones：estrogen and progesterone

Oviduct: epithelium (ciliated and nonciliated cells), muscle layer

Mammary gland

Development

resting stage：lactiferous sinuses and ducts, no alveoli

active stage：proliferation of terminal ducts to form alveoli（secretory cells and myoepithelial cells）

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed.
Chapter 23, pp. 772-790, 810-816, 830-832

6.題目：女性生殖系統(二) Female reproductive system II

教學目標：

Histological organization of uterus, cervix, vagina and placenta

講授大綱：

Uterus：

Endometrium（uterine glands, straight and coiled arteries）

endometrial matrix

Myometrium

Perimetrium

Uterine cycle: menstrual,proliferative,secretory and ischemic stages

Relationship between ovarian cycle and menstrual（uterine）cycle

Vagina, cervical canal

Placenta

Textbook and Atlas : Ross and Pawlina (2006) ***HISTOLOGY*** : A Text and Atlas. 5th ed. Chapter 23, pp. 790-804, 818-828

肆、生理學甲下

上課時間：週四 6-9 週五 6-9　　地點：基 501　　授課對象：醫學系、法醫所

上學期課程：生理學甲下(4 學分)

週次	日期	星期	時數	時 間	主　　題	教 師
一	3/5	四	3	13:20-16:20	Energy metabolism and homeostasis & The endocrine system	蘇慧敏
	3/6	五	3	13:20-16:20	The endocrine system & Hypothalamus-pituitary axis	蘇慧敏
二	3/12	四	3	13:20-16:20	GH & TH & Endocrine regulation of Ca & P metabolism	蘇慧敏
	3/13	五	3	13:20-16:20	Endocrine pancreas and adrenal	胡孟君
三	3/19	四	3	13:20-16:20	Reproduction	胡孟君
	3/20	五		13:20-16:20	Lab 1: 雌鼠性週期	
四	3/26	四	2	13:20-15:10	Synaptic physiology	湯志永
	3/27	五	2	13:20-15:10	Synaptic physiology	湯志永
				15:30-17:20	Lab 2: NIA2 (I)	
五	4/2	四	清明			
	4/3	五	連假			
六	4/9	四	2	13:20-15:10	Somatic sensory physiology	湯志永
	4/10	五	2	13:20-15:10	Somatic sensory physiology	湯志永
				15:30-17:20	Lab 3: NIA2 (II)	
七	4/16	四	2	13:20-15:10	Motor physiology	湯志永
	4/17	五	2	13:20-15:10	Motor physiology	湯志永
八	4/23	四		13:20-15:00	期中考試	
	4/24	五		13:20-17:20	Lab 4: NIA2 (III)	
九	4/30	四	2	13:20-15:10	Function of autonomic nervous system	詹智強
	5/1	五	2	13:20-15:10	Hypothalamus and motivated behavior	詹智強
			2	15:30-17:20	Lab 5: Physiology of animal behavior	蘇慧敏
十	5/7	四	2	13:20-15:10	Emotion and mental disorder	詹智強
	5/8	五	2	13:20-15:10	Sex and brain	詹智強
			2	15:30-17:20	Lab 6: Animal models for neurophysiology	詹智強
十一	5/14	四	停課			
	5/15	五	5	**13:00-14:20** **14:30-15:50** **16:00-17:30**	Consciousness and sensori-motor integration	郭鐘金
十二	5/21	四	2	13:20-15:10	Olfactory and Gustation	林怡岑
	5/22	五		13:20-17:20	Lab 7-1: 複合動作電位&睪丸切除對雄鼠性行為的影響影片教學與小組討論	
十三	5/28	四	2	15:30-17:20	Vision	楊長豪
	5/29	五		13:20-17:20	Lab 7-2: 複合動作電位&睪丸切除對雄鼠性行為的影響影片教學與小組討論	
十四	6/4	四	2	13:20-15:10	Equilibrium	楊庭華

	6/5	五		13:20-17:20	Lab 8-1: 不反應期與碰撞現象& 睪丸切除對雄鼠性行為的影響討論、眼球震顫	
十五	6/11	四	2	13:20-15:10	Hearing	吳振吉
	6/12	五		13:20-17:20	Lab 8-2: 不反應期與碰撞現象& 睪丸切除對雄鼠性行為的影響討論、眼球震顫	
十六	6/18	四				
	6/19	五		13:20-16:00	期末考試、實驗考試	
十七	6/25	四	端午 連假			
	6/26	五				
十八	7/2	四				
	7/3	五				

※課程負責老師：胡孟君老師(分機:88239; email: mengchun@ntu.edu.tw; office:基醫大樓 1024 室)

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：

生理學甲下課程大綱	
課程目標	學習完整人體生理學知識
課程概述 Lecture	Energy metabolism and homeostasis The endocrine system Hypothalamus-pituitary axis GH & TH Endocrine regulation of Ca & P metabolism Endocrine pancreas and adrenal Reproduction Synaptic physiology Somatic sensory physiology Motor physiology Function of autonomic nervous system Hypothalamus and motivated behavior Sex and brain Emotion and mental disorder Consciousness and sensori-motor integration Vision Hearing Olfaction and Gustation Equilibrium
實驗項目	雌鼠性週期觀察 NIA2 (I) : The Na action potential & Threshold: To fire or not to fire NIA2 (II) : The neuromuscular junction & Postsynaptic inhibition & Interactions of synaptic potentials NIA2 (III) : Site of impulse initiation & Impulse invasion of the presynaptic terminal & Coincidence detection Physiology of animal behavior Animal models for neurophysiology 睪丸摘除對雄鼠性行為之影響影片教學與小組討論 複合動作電位 I (電刺激閾值，傳導速度) 複合動作電位 II (不反應期與碰撞現象) 眼球震顫

生理學甲課程大綱：下學期

1.題目：Energy homeostasis & body temperature regulation

教學目標：Energy Balance & Thermal Balance

講授大綱：

1. Energy balance
   a. Energy intake
   b. Energy output
2. BMR
3. Hormonal regulation of energy intake
   a. leptin
   b. grelin
4. ATP
5. Body temperature regulation
6. Thermal balance
   a. Heat production
   b. Heat loss

2.題目：The Endocrine system

教學目標：Principle of Endocrinology

講授大綱：

Hormone classification

1. Protein / polypeptide hormones
2. Steroid hormones
3. Amine-derived hormones
4. Lipid-derived hormones: eicosanoids

3. 題目：Hypothalamus-pituitary gland

教學目標：Hypothalamus-pituitary axis

講授大綱：

1. Hypothalamus-posterior pituitary gland
   a. Hypothalamus-pituitary gland axis
   b. Posterior pituitary gland
   - anti-diuretic hormone (ADH)
   - Oxytocin
2. Hypothalamus- anterior pituitary-target axis

4. 題目：GH melatonin & TH

教學目標：growth hormone, melatonin & thyroid hormone

講授大綱：

1. Growth Hormone (GH)
   a. Synthesis & release of GH.
   b. Mechanism of GH Actions.

c. Regulation of GH Secretion.
d. Factors affecting GH Secretion

2. Melatonin
   a. Synthesis & release of melatonin.
   b. Mechanism of melatonin Actions
   c. Regulation of melatonin Secretion
   d. Factors affecting melatonin Secretion

3. Thyroid Hormones (TH)
   a. Synthesis & release of TH.
   b. Mechanism of TH Actions.
   c. Regulation of TH Secretion.
   d. Factors affecting TH Secretion.

5.題目：Endocrine regulation of calcium & phosphate metabolism

教學目標： Ca & P homeostasis

講授大綱：

1. parathyroid hormone (PTH)
2. 1,25-(OH)2-vitamin-D3
3. Calcitonin (CT)

6. 題目：Endocrine pancreas

教學大綱：

1. Islet: structure & products
2. Insulin
   a. Biosynthesis & secretion
   b. Regulation of secretion
   c. Receptor and functions
3. Glucogan
   a. Biosynthesis
   b. Functions
   c. Regulation of secretion
4. Somatostatin
5. Plasma glucose control
6. Diabetes mellitus

7.題目：Adrenal

教學大綱：

1. Adrenal structure: cortex vs. medulla
2. Adrenal medulla
   a. Catecholamine biosynthesis
   b. Regulation of hormone secretion
   c. Adrenergic receptors and actions

d. Disorders

3. Adrenal cortex
   a. Steroid hormones biosynthesis
   b. Regulation of steroid hormones biosynthesis
   c. Steroid receptors and actions
   d. Disorders

8. 題目：Reproduction

教學大綱：

1. General concepts of reproduction: male vs. female
   a. Gametogenesis
   b. Sex steroids biosynthesis
   c. Control of gonads
2. Male reproductive system
   a. Structure
   b. Sperm formation
   c. Regulation of testicular function
   d. Androgen receptor and actions
3. Female reproductive system
   a. Structure
   b. Follicle development
   c. Regulation of ovarian function
   d. Menstrual cycle and ovulation
4. Endocrinology of pregnancy
   a. Fertilization
   b. Implantation & placenta
   c. Hormones biosynthesis
   d. Hormones actions
5. Hormones and sex differentiation
   a. Gonads development
   b. Embryonic differentiation of male and female genitalia
   c. Disorders

(以下開始神經生理學部分)

9.題目：Functions of Autonomic Nervous System (ANS)

教學目標：To understand the functions of autonomic nervous system

講授大綱：

Functions of Autonomic Nervous System (ANS)

1.Introduction

2.Morphological review

(A).Sympathetic division (thoracicolumbar)

Preganglionic neurons
Paravertebral ganglia
Sympathetic chain
Prevertebral ganglia
Adrenal medulla
(B).Parasympathetic division (craniosacral)
Preganglionic neurons
3.Transmitter and receptor coding
(A).Preganglionic neurons
Acetylcholine
Cholinergic receptor: nicotinic receptor
(B).Postganglionic neurons
Sympathetic NS
Norepinephrine / adrenergic receptor
Parasympathetic NS
Acetylcholine / muscarinic receptor
Adrenergic subtype (α1, α2, β1,β2)
Muscarinic subtype (M1, M2, M3, M4)
Neuromodulator
(C).Ganglionic transmission
Hexamethonium
Curare / *neuromuscular junction (skeletal)*
(D).Postganglionic transmission
Sympathetic NS
Parasympathetic NS
4.Functions
(A).Sympathetic division
Energy expenditure
Catabolism
Continuous adjustments
(B).Parasympathetic division
Energy storage
(C).Interaction
Dual innervation
Single innervation
5.Autonomic control of homeostasis
(A).Functional organization
Reflex arc
Visceral afferents
Sympathetic NS
Parasympathetic NS
Axon reflex
(B).Mechanisms of control
(C).Involvement of the CNS
brain stem and spinal cord
hypothalamus “head ganglion”

limbic system
cortex

推薦閱讀資料：

1. W. Jänig, The Integrative Action of the Autonomic Nervous System (2006)
2. M.F. Bear et al., Neuroscience: Exploring the Brain (2007) 3ed

10.題目：Functions of Hypothalamus and Motivated Behavior

教學目標：To understand the function of hypothalamus and motivated behavior

講授大綱：

Hypothalamus and Motivated Behavior

1. Morphology
2. Overview of hypothalamic functions
3. Endocrine and neuroendocrine control
   releasing hormone
   pituitary gland
   supraoptic nucleus
   paraventricular nucleus
   vasopressin / oxytocin
   hypothalamo-hypophyseal tract
4. Integration of ANS functions
   head ganglion
   sympathetic response / emotions
   stimulation posterior hypothalamus
   blood pressure
   stimulation lateral hypothalamus
   adrenal medulla activity
   paraventricular nucleus
   preganglionic neuron / amygdala
5. Circadian rhythm
   preoptic area
   posterior hypothalamus
   suprachiasmatic nucleus (SCN)
6. Fluid homeostasis
   hypertonic / OVLT
   hypovolemic / angiotensin II
   subfornical organ / ADH
   vagus / nucleus of solitary tract
7. Eating behavior
   (A). Long-term regulation
      [1].energy balance
      [2].hormonal and hypothalamic control
      lipostatic hypothesis / fat homeostasis
      ob/ob mouse / leptin / adipocyte
      feeding center / satiety center
   (B).Short-term regulation

satiety signal
gastric distension / CCK / insulin

8.Motivation
(A).Types of motivation
(B).Methods of measurement
(C).Intracranial self-stimulation (ICSS)
reward / approach system
punishment / avoidance system
(D). Addiction
morphine / heroin / amphetamine / nicotine / cocaine

推薦閱讀資料：

1. M.F. Bear et al., Neuroscience: Exploring the Brain (2007) 3ed
2. E.R. Kandel et al., Principles of Neural Science (2000) 4ed

11.題目：Sex and Brain
教學目標：To understand the relationship of Sex and Brain
講授大綱：

Sex and Brain

1. Definition of sex
(A). Chromosomal sex : XX / XY
(B). Gonadal sex : ovary / testis
(C). Gametic sex : ova / sperms
(D). Hormonal sex : ratio of estradiol to testosterone
(E). Morphological sex : external genitalia
(F). Behavioral sex : parental care / sing
(G). Legal sex : gender identity / gender role
2.Cause of behavioral sex differences
(A).Ultimate cause
asexual reproduction
sexual reproduction
comparison of sexual dimorphism
monogamous vs. polygamous
(B). Proximate cause
hormone
organizational effect
activational effect
3.Hormonal control of sex
(A). Principal male and female hormone
androgens / testosterone
estrogens / estradiol
aromatase
(B).Hypothalamus and pituitary gland
gonadotropin / LH / FSH
GnRH
4.Sexual behavior

(A). Endocrine functions
castration / ovariectomy
postmenopause : libido
adrenal cortex / steroid
testosterone : homosexual drive
(B). Features in rodents
mount / intromission / ejaculation
lordosis / lordosis quotient (LQ)
(C). Neural control in the male
olfactory system
pheromone / vomeronasal organ
Bruce effect / Coolidge effect
hypothalamus
rat : intrahypothalamic implant of testosterone
monkey : stimulation medial forebrain bundle
penile erection
limbic system
cat and monkey : bilateral pyriform cortex lesion ◊ hypersexuality
humans : amygdala lesion / hypersexuality
(D). Neural control in the female
hypothalamus
estrogen implantation : heat
anterior hypothalamus lesion : loss of heat
amygdala
neocortex / limbic cortex removal : loss of male-seeking behavior
5.Sexual differentiation
(A).Critical period
neonatal female / androgen
masculinization
neonatal male / castration
feminization
(B).Organizational effect and activational effect
6.Atypical sexual differentiation
(A).Transexuslity
(B).Homosexuality

推薦閱讀資料：

1. M.F. Bear et al., Neuroscience: Exploring the Brain (2007) 3ed
2. E.R. Kandel et al., Principles of Neural Science (2000) 4ed

12.題目：Emotion and Mental Disorders

教學目標：To understand the relationship of Emotion and Mental Disorders

講授大綱：

Emotion and Mental Disorders

1.Introduction
(A). Theories of emotion

James-Lange theory
Cannon-Bard theory
(B). Limbic system
limbic lobe
Papez circuit
(C). Klüver and Bucy syndrome
bilateral temporal lobectomy
docile
hypersexual
visual agnosia (psychic blindness)
oral examination
loss of fear
2.Amygdala and associated brain circuits
(A). Anatomy of amygdala
(B). Amygdala and fear
bilateral amygdalectomy
case S.M.
electric stimulation
learned fear
(C). Amygdala and aggression
predatory aggression
affective aggression
psychosurgery
3.Hypothalamus and aggression
sham rage
cerebral cortex
anterior hypothalamus
posterior hypothalamus
4.Midbrain and aggression
medial forebrain bundle
dorsall longitudinal fasciculus
5.Serotonin and aggression
raphe nucleus / turnover rate
parachlorophenylalanine (PCPA)
5-HT1B receptor
6.Mental illness and the brain
(A). Psychosocial approach
psychoanalysis
psychotherapy
(B). Biological approach
7.Anxiety disorders
(A). Types
panic disorder
agoraphobia
obessive-compulsive disorder (OCD)
(B). Biological bases

stress response
HPA axis / amygdala and hypothalamus

(C). Treatments

psychotherapy
anxiolytic medication
benzodiazepines
serotonin-selective reuptake inhibitors (SSRIs)

13.Affective disorders

(A). Types

major depression
bipolar disorder / mania

(B). Biological bases

monoamine hypothesis
diathesis-stress hypothesis

(C). Treatments

electroconvulsive therapy / psychotherapy
antidepressant drugs
NE-selective reuptake inhibitors / SSRIs
tricyclic compound / MAO-inhibitors
lithium

9.Schizophrenia

(A).Symptom

(B).Biological bases

gene and environment
dopamine hypothesis
glutamate hypothesis

(C). Treatments

推薦閱讀資料：

1. M.F. Bear et al., Neuroscience: Exploring the Brain (2007) 3ed
2. E.R. Kandel et al., Principles of Neural Science (2000) 4ed

13.題目：Synaptic Physiology

教學目標：To understand the basic mechanisms underlying synaptic transmission in the nervous system.

講授大綱：

1. Presynaptic mechanisms of synaptic transmissions
2. Postsynaptic mechanisms of synaptic transmissions
3. Modulations of synaptic transmission
4. Common synaptic circuits in the nervous system

推薦閱讀資料：

- “Neuroscience: exploring the brain” (2006)
  Bear

- “Principles of neural science” (2000)
  Kandel, Schwartz, & Jessell

- "Clinical neuroanatomy and related neuroscience" (2002) FitzGerald & Folan-Curran

** **Downloadable PDF files**:

Brain Facts:

http://web.sfn.org/content/Publications/BrainFacts/brainfacts.pdf

Neuron Review paper: **Neuron Vol. 25 (2000) S1–S55.**

A concise version of "Principle of Neural Science".

14.題目：Somatic Sensory Physiology

教學目標：To understand how somatic sensory signals are coded, processed and projected to the somatosensory cortex.

講授大綱：

1. Coding of sensory information
2. Tactile information and primary somatic sensory cortex
3. Nociception and processing of nociceptive information
4. Factors modulationg the preception of pain in the nervous system

推薦閱讀資料：

1. Kandel ER et al. (2000) Principles of neural sciences 4th Ed., pp411-506.
2. Nicholls, JG et al. (2001) From neuron to brain. 4th Ed., pp333-378.
3. Zigmond, MJ et al. (1999) Fundamental neuroscience. Pp657-670, 761-789.

15.題目：Motor Physiology

教學目標：To understand how motor signals are executed and defined at different levels of the nervous system.

講授大綱：

第一堂課：Spinal reflex and α-γ motor neuron co-activation.

第二堂課：Rhythmic movement and central pattern generator.

第三堂課：Voluntary movement and motor cortex.

第四堂課：Voluntary movement and subcortical control.

推薦閱讀資料：

1. Kandel ER et al. (2000) Principles of neural sciences 4th Ed., pp713-781, 832-867.
2. Nicholls, JG et al. (2001) From neuron to brain. 4th Ed., pp447-476.
3. Zigmond, MJ et al. (1999) Fundamental neuroscience. pp889-992.

16.題目：Conciousness and sensorimotor integration

教學目標：To provide a mechanistic and integrative view of the cortical process involved in cognition and motor control.

講授大綱：

1. Consciousness and self-awareness
2. Basic neural circuits and electrophysiological mechanism underlying attention
3. Perception and cognition of pain and other sensory input

4. Planning and execution of motor output
5. Disorders related to consciousness and sensorimotor integration

17.題目：Vision

教學目標：To understand basic and clinical aspects of visual science

教學大綱：* Architecture of retina, optic nerve, optic chisma and optic tract
* Optics of the eye
* Near triad
* Accommodation
* Pupillary light reflex
* Visual acuity
* Visual field
* Electrical responses of the retina
* Clinical electrophysiology
* Dark adaptation
* Central visual pathway
* Receptive field
* Architecture of visual cortex
* Visual psychophysics
  - Form vision
  - Motion perception
  - Color vision
  - Binocular vision
* Critical fusion frequency
* Eye movement
* Plasticity of visual development

推薦閱讀資料：

1. William M. Hart Ed.: Adler's Physiology of the Eye. St. Louis, Baltimore, Boston, Chicago, London, Philadelphia, Sydney,Toronto, Mosby-Year Book, Inc., 1992.
2. David H. Hubel: Eye, Brain and Vision. New York, Scientific American Library, 1988.
3. Martin J. Tovee: An introduction to the visual system. Cambridge University Press. 1996.
4. Brain A. Wandell: Foundations of Vision. Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts. 1995.
5. Steven H. Schwartz: Visual perception, a clinical orientation. 2nd ed. Appleton & Lange, Stamford, Connecticut. 1999.
6. John Cronly-Dillon Ed.: Vision and visual dysfunction, 17 volumes. Macmillan Press Ltd., 1991.

18.題目： Hearing

1. To understand the basic physiology of the auditory system including the functions of the outer ear, middle ear, inner ear, and the auditory nerve.
2. To introduce hearing disorders

講授大綱：

1. Outer ear and middle ear
   a. Functional anatomy
   b. Sound transmission in the outer ear and the middle ear
2. Inner ear/cochlea
   a. Functional anatomy
   b. Sound transmission and the determination of frequency and loudness
3. Central auditory nervous pathways
   a. Functional anatomy
   b. Central auditory mechanisms and the determination of the direction of sound
4. Hearing abnormalities

推薦閱讀資料：

1. Ganong：
   書名/作者　Ganong's review of medical physiology/ Kim E. Barrett ... [et al.], Chapter 10: Hearing & Equilibrium
   出版項　McGraw-Hill Medical, 2016
   版本項　25th ed

2. Guyton and Hall：
   書名/作者　Textbook of medical physiology / Arthur C. Guyton, John E. Hall, Chapter 53: The sense of hearing
   出版項　Philadelphia: Elsevier Saunders, 2015
   版本項　13th ed.

19.題目：Olfaction and Gustation

教學目標：

1. To illustrate the physiology of olfaction and gustation (taste)
2. To introduce olfactory and taste disorders

教學大綱：

1. Olfaction:
   a. The olfactory epithelium and olfactory bulb
   b. Mechanism of stimulation of the olfactory receptor neurons
   c. Transmission of olfactory signals into the central nervous system
   d. Introduction of olfactory disorders
2. Gustation:
   a. The location and cellular composition of taste buds
   b. Mechanism of stimulation of the taste buds
   c. Transmission of taste signals to the central nervous system
   d. Introduction of taste disorders

推薦閱讀資料：

3. Ganong：
   書名/作者　Ganong's review of medical physiology/ Kim E. Barrett ... [et al.]

出版項　McGraw-Hill Medical, 2016
版本項　25th ed

4. Guyton and Hall：
書名/作者　Textbook of medical physiology / Arthur C. Guyton, John E. Hall
出版項　Philadelphia : Elsevier Saunders, 2015
版本項　13th ed.

20. 題目：Equilibrium

教學目標：to understand:

1. The basic morphology of peripheral and central vestibular organs
2. Applied vestibular physiology
3. Relation of vestibular physiology to human balance disorders

講授大綱：

The basic morphology of peripheral and central vestibular organs

1. Anatomy: organization of the vestibular labyrinth in inner ear
2. Anatomy: innervation of the vestibular organs
3. Anatomy: Cellular morphology of the vestibular sensory neuroepithilium
4. Anatomy: Central pathway of the vestibular system

Applied vestibular physiology

1. The vestibular system primarily drives reflexes to maintain stable vision and posture
2. Semicircular canals encode rotation of the head and otolith organs encode liner acceleration and tilt
3. Stimulation of the semicircular canal produces eye movements in the plane of that canal
4. A semicircular canal is normally excited by rotation in the plane of the canal brining the head toward the ipsilateral side
5. The response to simultaneous canal stimuli is approximately the sum of the responses to each stimulus alone
6. Nystagmus due to dysfunction of semicircular canals has a fixed axis and direction with respect to the head
7. The utricle senses both head tilt and translation, but loss of unilateral utricular function is interpreted by the brain as the head tilt toward the opposite side
8. Sudden changes in saccular activity evoke changes in posture tone
9. Normal vestibular system can rapidly adjust the vestibular reflexes according to the context, but adaptation to unilateral loss of vestibular function may be slow and susceptible too decompensation.

Relation of vestibular physiology to human balance disorders

1. Lab test to assess vestibular function: caloric test
2. Differentiation of central and peripheral nystagmus

example of clinical vestibular diseases: BPPV (benign paroxysmal positional vertigo)

推薦閱讀資料：

1. Cummings Otolaryngology Head and Neck Surgery, 2005 edition, volume 4, Chapter 138 and 139. pp. 3089 to 3159.

伍、胚胎學下

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（下學期）

上課教室： 501 講堂

	日期	時　間	主　　題	任課教師
01	3/2 Mon	10:20-12:10	Body cavities and serous membrane	陳玉怜
02	3/16 Mon	10:20-12:10	Human Birth Defects	黃韻如
03	3/23 Mon	10:20-12:10	Common signaling pathways used during development	錢宗良
04	4/14 Tue	09:10-11:10	Urogenital system (I)	呂俊宏
05	4/21 Tue	08:10-10:00	Urogenital system (II)	呂俊宏
06	5/5 Tue	15:30-17:20	Nervous system	謝松蒼
07	5/19 Tue	08:10-10:00	Head and neck：pharyngeal apparatus	婁培人
08	6/8 Tue	08:10-9:00	Eyes and ears	林能裕
	6/23 Tue	13:30-15:00	期末考	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

教學大綱

教學大綱

1. 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.

2. 題目：Body cavities and serous membrane

教學目標：

1. Formation of coelomic cavity
2. Formation of thoracic cavity and diaphragm
3. Formation of abdominal cavity and mesenteries

講授大綱：

Formation of coelomic cavity
- Intra-embryonic coelom
  - somatic mesoderm layer
  - splanchnic mesoderm layer

Diaphragm and thoracic cavity
- septum transversum
- pericardioperitoneal canal
- pleuopericardial fold/plueopericardial membrane/fibrous pericardium
- thoracic cavity
- components of the diaphragm
- diaphragmatic hernia
  - esophageal hernia, parasternal hernia

Mesenteries and Abdominal cavity
- Formation of ventral mesentery
  - Falciform ligament, lesser omentum, round ligament of the liver
- Formation of dorsal mesentery
  - Dorsal mesogastrium

lienorenal ligament, gastrolienal ligament, greater omentum
Omental bursa
Dorsal mesoduodenum
Mesentery proper
Dorsal mesocolon

3. 題目：Human birth defects

教學目標：Comprehend a birth defect or congenital anomalies to be a structural abnormality that is present at birth. There are four clinically significant types of anomalies: malformations, disruption, deformation, and dysplasia.

講授大綱：

1. Classification of birth defects
2. teratology-study of abnormal development
3. anomalies caused by genetic factors, environmental factors, and multifactorial inheritance

4. 題目：Urogenital system (Ⅰ)

教學目標：To study the normal development and congenital malformations of the urogenital system.

講授大綱：

Ａ. URINARY SYSTEM

1. Describe the formation of the excretory unit.
2. Describe the formation of the pronephros, mesonephros and metane phros.
3. Describe the formation of the metanephros.
4. Describe the congenital malformations.

Ｂ. GENITAL SYSTEM

1. Describe the development of the indifferent gonad.
2. Describe the development of the genital ducts.
3. Describe the development of the external genitalia.
4. Describe the congenital malformations.

5. 題目：Urogenital system (Ⅱ)

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

講授大綱：

Ａ. URINARY SYSTEM

1. Describe the formation of the excretory unit.
2. Describe the formation of the pronephros, mesonephros and metane phros.
3. Describe the formation of the metanephros.
4. Describe the congenital malformations.

Ｂ. GENITAL SYSTEM

1. Describe the development of the indifferent gonad.
2. Describe the development of the genital ducts.
3. Describe the development of the external genitalia.
4. Describe the congenital malformations.

6. 題目：Common signaling pathways used during Development

教學目標：To study the morphogens and key developmental signal pathways

講授大綱：

A. Morphogens
   1. Retinoic acid
   2. Transforming Growth Factors/ Bone Morphogenetic Proteins
   3. Hedgehog
   4. Wnt/β-Catenin Pathway

B. Notch-Delta Pathways

C. Transcription Factors
   1. Hox/Homeobox Proteins
   2. Pax Genes
   3. Basic Helix-loop-Helix Transcription Factors

D. Receptor Tyrosine Kinases and their signal pathways

7. 題目：Nervous system

教學目標：To understand the development of the central nervous system

講授大綱：

Neural tube（ectodermal origin）develops into spinal cord. brain and autonomic system.

1. Spinal cord：basal plate gives rise to motor neurons.
   alar plate gives rise to sensory neurons. floor and roof plates.
2. Brain：
   a) Rhombencephalon forms medulla oblongata, cerebellum and pons.
   b) Mesencephalon forms midbrain.
   c) Diencephalon forms thalamus and hypothalamus.
   d) Telencephalon forms cerebral hemispheres.
   e) Ventricular system contains cerebrospinal fluid.
3. Autonomic system
   originates from neural crest cells.
   sympathetic and parasympathetic nervous systems.
   adrenal gland.

8. 題目：Head and Neck：Branchial Apparatus

教學目標：To comprehend the development of the head and neck.

講授大綱：

1. Pharyngeal arches, pouches and clefts.
2. Tongue and thyroid gland development.
3. The face and palate formation：Maxillary, mandibular and intermaxillary segments. Cleft lips.
4. Paranasal sinuses, nasal conchae and teeth.
   Odontoblasts and cementoblasts.

陸、神經解剖學

教學目標：正確瞭解中樞神經系統中：(1)腦與脊髓之外部形態以及內部構造；(2)各功能系（核群）之主要聯繫徑路及其對人體各器官支配之功能與意義及(3)腦與脊髓之血管分佈模式，以啣接大體解剖學、組織學及胚胎學成一完整之解剖學課程。課程內容包含演講與實習，自外而內，由結構至功能循序漸近，配合觀察實物、標本、模型、腦組織切片，以及三度空間的位置關係，作整體之瞭解。
上課地點：基 501 講堂

108 學年度第二學期醫學、牙醫、研究所神經解剖學 － 課程進度表

Date	Time	Title		Teacher
1	2020/3/02 Mon	8:10-8:20	Introduction to the course (10 min)	呂俊宏
		8:20-10:00	Overview of CNS, meninges, and Cerebrospinal fluid	謝松蒼
2	2020/3/09 Mon	8:10-10:00	Spinal Cord	呂俊宏
		10:20-12:10	Brainstem (I) : External Morphology & Inner Structure	李立仁
3	2020/3/16 Mon	8:10-10:00	Brainstem (II) : External Morphology & Inner Structure	李立仁
4	2020/3/23 Mon	8:10-10:00	Brainstem (III) : External Morphology & Inner Structure	李立仁
5	2020/3/30 Mon	8:10-10:00	Cerebellum :External Morphology & Inner structure	錢宗良
		10:20-12:10	Diencephalon : External Morphology & Inner Structure	錢宗良
6	2020/4/06 Mon	8:10-10:00	Telencephalon (I) : External Morphology & Inner Structure	尹相姝
		10:20-12:10	Limbic System	謝松蒼
7	2020/4/13 Mon	8:10-10:00	Telencephalon (II) : External Morphology & Inner Structure	尹相姝
		10:20-12:10	Lab Introduction (501) Gross Anatomy：CNS (501) Lab I（一東）	
8	2020/4/20 Mon	8:10-10:00	**Midterm(lecture only 3/2~4/13)**	
		10:20-12:10	Gross Anatomy： brain stem and brain slice (501) Lab II (一東)	

9	2020/4/27 Mon	8:10-8:30	quiz -- Gross Anatomy：CNS	
		8:30-10:40	Motor System I : Pyramidal System	曾國藩
		10:50-12:10	Lab III (501) Microscope brain slice： spinal cord ~ inferior colliculus	
10	2020/5/04 Mon	8:10-8:30	quiz -- Gross Anatomy：brain stem and brain slice	
		8:30-10:40	Motor System II : Extrapyramidal System; Central Control of Visceral Innervation	曾國藩
		10:50-12:10	Lab IV（三東） Review-- Microscope brain slice：spinal cord ~ inferior colliculus	
11	2020/5/11 Mon	8:10-8:30	quiz -- Microscope brain slice： spinal cord ~ inferior colliculus	
		8:30-10:40	Visual System	呂俊宏
		10:50-12:10	Lab V (501) Microscope brain slice：superior colliculus ~ thalamus	
12	2020/5/18 Mon	8:10-8:30	quiz -- Microscope brain slice：superior colliculus ~ thalamus	
		8:30-10:40	General and Visceral Sensory Systems	呂俊宏
13	2020/5/25 Mon	8:10-10:00	Auditory and Vestibular Systems	呂俊宏
		10:20-12:10	Lab VI（三東） Review-- Microscope brain slice：superior colliculus ~ thalamus	
14	2020/6/01 Mon	8:10-10:00	Blood Supply of Central Nervous System	謝松蒼
15	2020/6/22 Mon	8:10-12:10	**Final Exam (lecture 3/23~ 6/08 and lab)**	

Textbook：

The human brain : an introduction to its functional anatomy

Nolte J. and Sundsten J., 7th ed., Mosby/Elsevier, 2015.

References：

1.Barr's The human nervous system : an anatomical viewpoint

Kiernan J. A., 10th ed., Lippincott Williams & Wilkins, 2014

2.Fundamental neuroscience for basic and clinical applications

Haines D.E., 5th ed., Churchill Livingstone Elsevier, 2018.

3. Neuroanatomy in Clinical Context: An Atlas of Structures, Sections, and Systems

Haines 9th ed., Lippincott Williams & Wilkins, 2014

負責助教老師： 張銘峰 基礎醫學大樓六樓 Rm 605, 分機 62212, anatomy@ntu.edu.tw

教學大綱：

單元 1

題　目：Introduction to the central nervous system, meninges, cerebrospinal fluid

教學目標：1. To understand the general organization of the central nervous system
2. To understand the structures of meninges
3. To understand the circulation of cerebrospinal fluid

講授大綱：

1. Functional organization of the cerebral cortex and Broadmann area
2. Circulation of the cerebrospinal fluid and its clinical implications
3. Meninges and its clinical relations to vessels and bleeding

單元 2

題　目：Spinal Cord : External Morphology & Inner Structure

教學目標：To understand the morphlogical characteristics and internal organization of the spinal cord

講授綱要：

1. External anatomy of the spinal cord
2. Spinal roots & nerves
3. Lainae of the spinal cord
4. Pathways & tracts
5. Spinal reflexes
6. Anatomical & clinical correlations

單元 3~5

題　目：Brainstem (Ⅰ) (Ⅱ) & (Ⅲ): External Morphology & Inner Structure

教學目標：1. To understand the external anatomy and intemal structure of the brainstem
2. To understand the anatomical and functional organizations of the RF

講授綱要：

I. External anatomy and intemal structure of the brainstem
1. Longitudinal organization of the brainstem
2. Surface brainstem landmarks
3. Brainstem cranial nerves & their cranial nuclei
4. Brainstem landmarks of functional significance
5. Transverse sections through the brainstem
6. Anatomical and clinical correlations

II. Reticular function (RF)
1. Define the RF
2. Anatomy of the RF: general considerations
3. Specific reticular nuclei and related information

4. Reticular fiber connections
5. Functional organization

單元 6

題　目：Cerebellum : External Morphology &　Inner Structure
教學目標：
1. Structure and connections of the cerebellum
2. Functional division of the cerebellum
講授大綱：
1. General feature of folia.
2. Partition of cerebellum: 3 lobes
Anterior of lobe
Posterior lobe
Floculonodular lobe
Longitudinal partitioning:
Medial and lateral regions
3. The organization of the cerebellum:
3 distinct layers: Molecular layer
Purkinje layer
Granular layer
5 cell types: Purkinje, granule, basket, stellate and Golgi cells.
Inputs and output connections of the cerebral cortex and nuclei.
4. Functional division of the cerebellum and its connections:
Vestibulocerebellum
Spinocerebellum
Cerebro (ponto-) cerebellum

單元 7

題　目：Diencephalon : External Morphology & Inner Structure
教學目標：To comprehend the structure and connections of diencephalon
講授大綱：
1. The anatomical position and functional significance of　diencephalon in the central nervous system.
2. The components of diencephalon.
3. Thalamus: Thalamic nuclei and connections.
4. The third ventricle.
5. Corpus Striatum

單元 8~9

題　目：Telencephalon : External Morphology & Inner Structure
教學目標：To understand the structure and functional organization of the cerebral hemisphere.
講授大綱：

1. Topography of the cerebral hemisphere.
2. Histology of the cerebral hemisphere, Cortical layers.
3. Functional localization in the cerebral cortex.
4. Medulllary center: White matter of the telencephalon, Internal capsule, Projection fibers, Lateral ventricle.

單元 10

題　目： General somatic and visceral system (GSA & GVA)

教學目標：To understand the connections for the general somatic sensory system and the possible function for these pathways

講授大綱：

a. Sensory Pathways for the body
   1. Pain and temperature - Spinothalamic system
   2. Proprioception - Medial lemniscus system
   3. Touch - Spinocervicothalamic pathway
b. Sensory Pathways for the Head
   1. Pain and temperature
   2. Touch
   3. Proprioception
c. Descending Pathways involved in Sensation

單元 11

題　目：Motor System Ⅰ: Pyramidal System

教學目標：

1. Distinction of upper and lower motor neurons
2. Motor effectors
3. Corticospinal system

講授大綱：

1. Motor neruons:
   Upper
   Lower
2. Effectors of the motor system:
   Motor units
      fast-fatigable
      fast fatigue-resistant
      slow
3. Lower motor neuron syndrome
4. Descending pathways to spinal cord:
   Direct pathway:
      corticospinal: Pyramidal
         Lateral corticospinal tract
         Ventral corticospinal tract
         Babinski sign

單元 12

題　目：Motor System Ⅱ: Extrapyramidal System　(+ Central Control of Visceral Innervation)

教學目標：

1. Indirect cortical motor controlling pathways
2. Cerebellar and basal ganglia involvement of motor control

講授大綱：

Lndirect: Pathways from brain stem:
Extrapyramidal motor system:
(1)Medial pathways:vestibulospinal:medial and lateral
reticulospinal:medial and lateral
tectospinal
(2)Lateral pathway:rubxrospinal
(3)Aminergic pathways: ceruleospinal system: noradrenergic
raphe-spinal system:　serotonergic
Cortical control of brain stem pathway:
Corticobulbar fibers
Upper motor neuron syndrome:
Systems controlling the descending pathways:
Cerebellar circuits
Basal ganglia
---Extrapyramidal

單元 13

題　目：Limbic System

教學目標：To understand the limbic structure + connections and the central autonomic connections.

講授大綱：

Limbic cortex
1. Hippocampal formation
Hippocampus
Dentate gyrus
Subiculum
Cingulate gyrus
Parahippocampus
Uncus
2. Subcortical nuclei
Amygdaloid complex
Septal nuclei
Hypothalamus
Epithalamus
Thalamus
3. Connections and circuits
Hippocampal formation and Papez circuit

Amygdala and its connections

單元 14

題　目： Visual System
講授大綱：

a. Pathway to the visual cortex
   i. Optic nerve, optic chiasma and optic tract
   ii. Lateral geniculate nucleus, geniculocalcarine tract and visual cortex
b. Visual Defects caused by interrruption of the Pathway
c. Visual Reflexes
d. Other visual Connections
e. Other Sensory Pathways

單元 15

題　目： Auditory and Vestibular Systems
教學目標：To understand the connections for the auditory and the possible function for these connections
講授大綱：

1. Auditory Pathways
   a. Pathways to auditory cortex
   b. Descending fibers in the auditory pathwav
2. Vestibular pathways

單元 16

題　目：Blood supply of Central Nervous System
教學目標：

1. Blood supply of brain and spinal cord
2. Clinical correlations of ischemia related to functional neuroanatomy

講授大綱：

1. Arterial supply of brain
   Internal carotid artery
   Vertebral artery
   Cerebral arterial circle (circle of Willis)
   Cortical branches
      Anterior cerebral artery
      Middle cerebral artery
      Posterior cerebral artery
   Central branches
      Central arteries
      Choroidal arteries

Blood supply of corpus striatum, internal capsule and diencephalon
Vertebral basilar system
Vertebral artery
Basilar artery
2. Clinical examples of ischemia due to occlusion of vessels