REQUIRED COURSES
Course Syllabus
SCAN521 Human Gross Anatomy Dissection

Name of Institute Mahidol University
Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN521 Human Gross Anatomy Dissection

2. **Credits** 2 (0-4-2) Credits (Lecture - practice – self-study)
3. **Course type**
   Required course.
4. **Course Coordinator**
   4.1 Course Coordinator
      1. Dr. Kanokpan Wongprasert
         Contact Department of Anatomy Faculty of Science
5. **Semester / Year of study**.
   Semester 1 / 1st year
6. **Pre-requisite courses**. none
7. **Co-requisite courses**. SCAN 520
8. **Place**
   Faculty of Science Mahidol University
9. **Last update.** July 22 2560

Section 2: Aims of Course.

1. **Aims of Course**
   The course provides knowledge and skills involving
   To study organ, the structure of muscles, bones, joints, blood vessels and nerves, function of the lymphatic system in the back, arms, legs, head, neck, chest, abdomen and pelvis.

Section 3 Course Description

1. **Description**
   Laboratory learning of regional and systemic gross anatomy from cadaver dissection, topographic sections

Section 4: Course Learning Outcomes

At the end of the course, the students will be able to:

CLO 1:	Exhibit understanding the ethics in cadeveric dissection, laboratory biosafety and university discipline	(ELO1,2, 3, 5)
CLO 2:	Acquire a thorough skill on human body dissection and explain structure fundamental to considerations of function in human body	(ELO1,2,5,7)
CLO 3:	Apply knowledge in Anatomy to clinical cases	(ELO2,3,4,5,7)

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Introduction to lab dissection	1	Lecture; Ethics introduction, Care of cadavers, Laboratory safety, Learning materials: Dissection manual, Cadevers; Models, Charts, Computer programs, Atlas, Radiological imaging	-Evaluation on class participation and student performances;
2	Superficial, intermediate and deep layers of back, Laminectomy and spinal cord	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	-Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
3	Pectoral and axilla, Arm and deltoscapular region, Forearm, Hand	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
4	Triangles of neck and structures understernocleidomastiod	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	- Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
5	Scalp,face and parotid region, Cranial cavities, intradural venous sinuses and brain removal, Temporal and Infratemporal regions	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	- Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class

	Content	CLO no.	T/L approach	Assessment Scheme
				participation and student performance using a rubric based on course learning objectives.
6	Eye and Ear, Prevertebral region,	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
7	Bisection of head: Pharynx and Nasal cavity, Larynx, Oral cavity, and Submandibular region	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
8	Thoracic wall and mediastinum, Heart and lung	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
9	Abdominal wall and inguinal region,	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	- Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
10	Abdominal contents, Posterior abdominal wall and contents	1,2	Self-study, Laboratory practice, Group discussion, Question and answer	Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance

	Content	CLO no.	T/L approach	Assessment Scheme
				using a rubric based on course learning objectives.
11	Male and Female perinrum, Pelvis	**1,2**	Self-study, Laboratory practice, Group discussion, Question and answer	- Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.
12	Dissection assignment: Gluteal region, Thigh, leg, foot	**1, 2, 3**	Assignment, self-study, Peer-group teaching, group discussion and presentation, Clinical correlation. Case study with a moral issue addressed	- Quality of dissections -Formative assessment (pre- and post-test) - Evaluation on class participation and student performance using a rubric based on course learning objectives. - Laboratory practice practical examination
13	Joints of Upper and Lower limbs	**1,2**	Self-study, Laboratory practice, Group discussion, Question and answer	- Formative assessment (pre- and post-test) -Laboratory practice practical examination (Summative) -Evaluation on class participation and student performance using a rubric based on course learning objectives.

2. Evaluation plan.

Events	Learning Outcome*	Assessment methods	The proportion of evaluation
1	1,2,3	Research assignment	10%
2	2,3	Written examination	70%
3	1,2,3	Group discussions	15%
4	2	Quiz	5%

Students must receive B grade to pass the course

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

Course Syllabus

SCAN523 Structure and Development of Human Body

Name of Institute Mahidol University
Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN523 Structure and Development of Human Body.

2. **Credits** 3 (3-0-6) Credits (lecture - practice - self-study).
3. **Course type**
   Required course.
4. **Course Coordinator**
   4.1 Course coordinator
      1. Dr. Krai Meemon
5. **Semester / Year of study**.
   Semester 1 / 1st year
6. **Pre-requisite courses**. none
7. **Co-requisite courses**. none
8. **Place** Department of Anatomy
9. **Last update**. 11 August 2560

Section 2: Aims of Course.

1. **Aims of Course**
   The course provides knowledge and skills involving:
   1.1 developmental process of human body in the systematic orientation.
   1.2 gross structures of all human body systems in relation to their functions.
   1.3 clinical correlation or organ defect of the given cases in each system.

Section 3 Course Description

1. **Description**
   Structure and function of multi-organ systems in human body; normal developmental patterns of organs and organ systems; developmental defects, applications and clinical relevances.

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1:	Describe the structure of the human body systematically and relate it to functions	**(ELO1,2,5,7)**
CLO 2:	Describe the development process of the human system in a systematic way	**(ELO1,2,5,7)**
CLO 3:	Apply basic knowledge to explain clinical pathology or organ dysfunction in each system	**(ELO2,7)**

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Introduction, Vertebral column, Muscles of back, Spinal cord and meninges	**1,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
2	Pectoral region and deltoscapular region, Axilla and brachial plexus, Arm, cubital fossa and forearm, Hand, Joints of upper limb	**1,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
3	Overview of human embryonic development	**2,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
4	Anterior and posterior triangles of neck, Deep structures in neck, Scalp and face, Cranial cavity and intradural venous sinus, Eye and ear	**1,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
5	Temporal and Infratemporal regions; Nose, nasal air sinus and mouth; Pharynx and Larynx; Prevertebral region	**1,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
6	Conference in autonomic nervous system	**1,2,3**	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation
7	Thoracic wall and lung; Heart and pericardium; Mediastinum and its contents)	**1,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
8	Abdominal wall and peritoneum; Inguinal	**1,3**	Lecture using Powerpoint; lecture handout;	-Formative assessment

	Content	CLO no.	T/L approach	Assessment Scheme
	and scrotal regions; Abdominopelvic cavity and internal organs; Posterior abdominal wall and contents)		Discussion; Suggested textbook and atlas	(pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
9	Conference in Thorax and Abdomen disorders	**1,2,3**	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation
10	Male and Female Perineum; Pelvis	**1,3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
11	Conference in neuromuscular disorder of lower limb	**1,2,3**	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation

2. Evaluation plan.

Events	Learning Outcome	Assessment methods	The proportion of evaluation
1	1,2,3	Written examination	70%
2	1,2,3	Group discussions	15%
3	1,2	Quiz	5%
4	1,2	Research assignment	10%

Students must receive B grade to pass the course

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

Course Syllabus

SCAN502 Structural Neurobiology

Institution Mahidol University
Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN502 Structural Neurobiology

2. **Credits** 3 (2-3-5) Credits (Lecture - practice - self-study).
3. **Course Type**
   Required course
4. **Course coordinator**
   4.1 Course coordinator
      1. Assoc. Prof. Charoensri Thonabulsombat
5. **Semester / Year of study**
   First semester / 1st year
6. **Pre-requisite course**. none
7. **Co-requisite course**: none
8. **Place** Department of Anatomy
9. **Last updated** June 14, 2561

Section 2: Aim of Course.

1. **The aim of the course**
   The course provides knowledge and skills involving
   1.1 Development of the nervous system and anatomy of the brain that are important for the arrangement of the different areas of the brain that control movement and get a feel for primary and secondary. The relationship between the cortex and sub-cortex.
   1.2 Function of the brain and the cortex. The signs and symptoms of pathological conditions including headache, increased intracranial pressure, brain tumors, and hydrocephalus syndrome.
   1.3 Motor systems, autonomic nervous system and sensory system. Symptoms caused by the pathology, including hemiparesis.
   1.4 Brain stem and cranial nerves. Signs and symptoms caused by pathological changes include loss of feeling and movement control in the face, hearing, vision and speech and so on.
   1.8 Higher brain function

Section 3 Course Description

1. **Description**
   Structure composition and development of human nervous system; functional organization in related to the structure of central nervous system; brain and spinal cord, brainstem, thalamus and hypothalamus, basal ganglia, cerebellum, cranial nerves, limbic system, cerebral circulation, ventricular system; pathways of sensory and motor systems

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1:	Describe development of the nervous system and anatomy of the brain	**(ELO1,2,5,7)**
CLO 2:	Describe structure and functions of ventricular system and meninges, inclduing symptoms and signs of their pathology	**(ELO1,2,5,7)**
CLO 3:	Describe structure, function, and neuronal regulation of the spinal cord, motor system, thalamus, autonomic nervous system and sensory systems, including their symptoms and signs of their pathology	**(ELO1,2,5,7)**
CLO 4:	Desccribe structure and functions of brainstem and cranial nerves, their symptoms and signs of their pathology	**(ELO1,2,5,7)**
CLO 5:	Desccribe structure and functions of cerebellum, and its symptoms and signs of their pathology	**(ELO1,2,5,7)**
CLO 6:	Desccribe structure and functions of basal ganglia, and its symptoms and signs of their pathology	**(ELO1,2,5,7)**
CLO 7:	Describe structure, function, and neural pathways of f the limbic system, specially hippocampus and amygdala, including its symptoms and signs of pathology	**(ELO1,2,5,7)**
CLO 8:	Describe structure and functions of the cerebral cortex and its high-level functions including language and behavioral planning, inclduing its symptoms and signs of pathology	**(ELO1,2,5,7)**
CLO 9:	Apply knowledge of the nervous system to explain symptoms and signs of pathology caused by various etiologies	**(ELO2,7)**

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Introduction, Overview and Organization of NS and Spinal Cord	**1,3,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation of assignment, presentation -Evaluation on class participation
2	Ventricles, Meninges and Neurovasculature	**2,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation of assignment, presentation -Evaluation on class participation
3	Brainstem and Cranial nerves	**4,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference;	-Formative assessment (pre- and post-test) -Writen exam (Summative)

	Content	CLO no.	T/L approach	Assessment Scheme
			Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation -Evaluation on class participation
4	Diencephalon, Somatosensory and Viscerosensory Pathways	**3,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation of assignment, presentation -Evaluation on class participation
5	Visual, Auditory and Vestibular Systems	**3,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation of assignment, presentation -Evaluation on class participation
6	Motor System, Basal Nuclei and Cerebellum	**3,5,6,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation of assignment, presentation -Evaluation on class participation
7	Visceral Motor Pathways, Hypothalamus, Limbic System and Cerebral Cortex	**7,8,9**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation of assignment, presentation -Evaluation on class participation

2. **Evaluation plan**

No.	Learning Outcome	The proportion of evaluation
1	1,2,3,4,5,6,7,8,9	50%
2	1,2,3,4,5,6,7,8,9 (10)	20%
3	1,2,3,4,5,6,7,8,9 (10)	30%

Students must receive B grade to pass the course

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

Course Syllabus

SCAN522 Structural Biology of Cell and Tissue

Institution Mahidol University

Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN522 Structural Biology of Cell and Tissue

2. **Credits** 3 (2-3-5) Credits (lecture - practice - self-study).
3. **Course Type**
   Required course
4. **Course coordinator**
   4.1 Course coordinator
      1. Kulathida Chaithirayanon
5. **Semester / Year of study.**
   First semester / 1st year
6. **Pre-requisite course**. none
7. **Co-requisite course**: none
8. **Place** Department of Anatomy
9. **Last updated**. June 27, 2561

Section 2: Aim of Course.

1. **The aim of the course**
   The course provides knowledge and skills involving
   1.1 Organization of the cells, tissues, organs and organ in the human body.
   1.2 Structure of tissues and organs using light microscopy in the cellular and molecular level.
   1.3 Relationship between structure and function of cells, tissues and organs
   1.4 Dysfunction of the organs in the system.
   1.5 Research of various systems.

Section 3 Course Description

1. **Description**
   Structural and molecular-cellular organization and functions of epithelium, connective tissue, muscles, nervous tissue, eye, ear, cartilage, bone, blood, integument system, digestive system, cardiovascular system, immune system, respiratory system, urinary system, endocrine system and. reproductive system

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1: Describe the characteristics of microscopic instrument used to study the organization of cell, organ and tissue in relation to the entire organ in the human body **(ELO2,7)**

CLO 2: Describe the structure and organization of tissues and organs using light microscopy or transmission electron microscopy at the **(ELO2,7)**

cellular and molecular levels

CLO 3: Describe the relationship between structure and function of cells, tissues and organs **(ELO2,7)**

CLO 4: Apply microscopic knowledge to describe clinical pathology or organ dysfunction in each system **(ELO4,5,7)**

CLO 5: Describe the research of various systems involving microscopic anatomy **(ELO1,5,7)**

Section 5: Teaching and Assessment

1. **Plan**

	Content	CLO no.	T/L approach	Assessment Scheme
1	Introduction, Basic Microscopy and Specimen Preparation	**1**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
2	Epithelium	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
3	Connective Tissue	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
4	Muscular tissue	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
5	Nervous tissue	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
6	Cartilage and Bone	**1,2,3,4**	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation
7	Blood Cells; Life Cycle of Blood Cells	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation

	Content	CLO no.	T/L approach	Assessment Scheme
8	Blood Vascular System	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
9	Microanatomy of Lymphoid System	**1,2,3,4**	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation
10	Microanatomy of Eye and Ear	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
11	Microanatomy of Integumentary System	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
12	Microanatomy of Digestive System	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
13	Microanatomy of Respiratory System	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
14	Microanatomy of Urinary system	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
15	Microanatomy of Endocrine System	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
16	Microanatomy of Male Reproductive System: Testis, Genital Ducts and Accessory Glands	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class

	Content	CLO no.	T/L approach	Assessment Scheme
			and atlas	participation
17	Microanatomy of Female Reproductive System	**1,2,3,4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
11	Conference in research involving microscopic anatomy and	**5**	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation

2. **Evaluation plan**

No.	Learning Outcome	The proportion of evaluation
1	1,2,3,4	80%
2	1,2,3,4,5	10%
3	5	10%

Students must receive B grade to pass the course

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

Course Syllabus

SCAN613 Seminar in Anatomy and Structural Biology I

Name of Institute Mahidol University

Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN613 Seminar in Anatomy and Structural Biology I

2. **Credits** 1 (1-0-2) Credits (lecture - practice - self-study).

3. **Course type**

Required course.

4. **Course Coordinator**

4.1 Course coordinator

1.. Dr. Sittipon Intarapat

5. **Semester / Year of study**.

Semester 1 / 2nd year

6. **Pre-requisite courses**. none

7. **Co-requisite courses**. none

8. **Place** Department of Anatomy

9. **Last update**. 11 August 2560

Section 2: Aims of Course.

1. **Aims of Course**

The course provides knowledge and skills involving

1.1 analysis of research data on topics of interest from reliable publications.

1.2 presentation of the results of scientific research.

1.3 developing skills both oral presentations and good writing skill

Section 3 Course Description

1. **Description**

International peer-reviewed papers; guidelines for active interaction and discussion.

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1:	Search and analyse research data on topics of interest in the field of anatomy and structural biology from reliable publications	**(ELO1,2,4,6,7)**
CLO 2:	Effectively present scientific research data, and answer related questions	**(ELO1,2,4,6,7)**
CLO 3:	Practice and develope good presentation and scientific writing skills	**(ELO1,2,4,6,7)**
CLO 4:	Appropriately evaluate the ethical validity of the proposed research	**(ELO1,2,4,6,7)**

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Searching high-impact scientific papers and preparation for presentation of research papers and abstracts	**1,3**	Introductory lecture; Suggested article and review; Discussion; Question and answer session	-Evaluation on participation using rubric
2	Presentation of research papers and interactive discussions -1	**1,2,3**	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics
3	Presentation of research papers and interactive discussions -2	**1,2,3**	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics
4	Presentation of research papers and interactive discussions -3	**1,2,3**	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics
5	Presentation of research papers and interactive discussions -4	**1,2,3**	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics

2. **Evaluation plan**.

Events	Learning Outcome	Assessment methods	The proportion of evaluation
1	1,2,4	- Content of research	80%
2	3	- Presentation	10%
3	3	- Abstract writing	10%

Students must receive B grade to pass the course

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

Course Syllabus

SCAN614 Seminar in Anatomy and Structural Biology II

Name of Institute Mahidol University

Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN614 Seminar in Anatomy and Structural Biology II

2. **Credits** 1 (1-0-2) Credits (lecture - practice - self-study).

3. **Course type**

Required course.

4. **Course Coordinator**

4.1 Course coordinator

1.. Dr. Sittipon Intarapat

5. **Semester / Year of study**.

Semester 2 / 2nd year

6. **Pre-requisite courses**. none

7. **Co-requisite courses**. none

8. **Place** Department of Anatomy

9. **Last update**. 11 August 2560

Section 2: Aims of Course.

1. **Aims of Course**

The course provides knowledge and skills involving

1.1 analysis of research data on topics of interest from reliable publications.

1.2 presentation of the results of scientific research.

1.3 developing skills both oral presentations and good writing skill

Section 3 Course Description

1. **Description**

International peer-reviewed papers; summarization of scientific finding, guidelines for criticizing the strong and weak points of the research articles; guidelines for active interaction and discussion.

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1:	Search and analyse research data on topics of interest in the field of anatomy and structural biology from reliable publications	**(ELO1,2,4,6,7)**
CLO 2:	Present scientific research data, and answer related questions	**(ELO1,2,4,6,7)**
CLO 3:	Practice and develope presentation skill and scientific writing skill	**(ELO1,2,4,6,7)**
CLO 4:	Evaluate the ethical validity of the proposed research	**(ELO1,2,4,6,7)**

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Searching high-impact scientific papers and preparation for presentation of research papers and abstracts	1,3	Introductory lecture; Suggested article and review; Discussion; Question and answer session	-Evaluation on participation using rubric
2	Presentation of research papers and interactive discussions -1	1,2,3	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics
3	Presentation of research papers and interactive discussions -2	1,2,3	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics
4	Presentation of research papers and interactive discussions -3	1,2,3	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics
5	Presentation of research papers and interactive discussions -4	1,2,3	Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation using rubrics -Evaluation on participation and discussion using rubrics

2. Evaluation plan.

Events	Learning Outcome	Assessment methods	The proportion of evaluation
1	1,2,4	- Content of research	80%
2	3	- Presentation	10%
3	3	- Abstract writing	10%

Students must receive B grade to pass the course

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

ELECTIVE COURSES

Course Syllabus

SCAN620 Selected Topics in Cellular Neuroscience

Name of Institute Mahidol University

Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN620 Selected Topics in Cellular Neuroscience
2. **Credits** 1 (1-0-2) Credits (lecture - practice - self-study).
3. **Course type**
   Elective course
4. **Course Coordinator**
   4.1 Course coordinator
   1. Assoc. Prof. Dr. Permphan Dharmasaroja
5. **Semester / Year of study**.
   First and second semesters / Any year
6. **Pre-requisite courses**. none
7. **Co-requisite courses**. none
8. **Place** Department of Anatomy
9. **Last update.** August 10, 2560

Section 2: Aims of Course.

1. **Aims of Course**
   The course provides knowledge and skills involving
   1.1 Markers of specific neuron types.
   1.2 Neurotransmitters and receptors, and clinical relevance.
   1.3 Application of neural cell lines.
   1.4 Mechanisms of neuronal injury.
   1.5 Mechanism of regeneration of neurons.
   1.6 Experimental models of various neurological diseases.

Section 3 Course Description

1. **Description**
   Neural marker, neurotransmitter, neural cell line, application of neural cell line, mechanisms of neuronal injury, mechanisms of neuronal regeneration, experimental models of neurological diseases.

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1:	Describe specific markers for various neurons inclduing their functions and applications	**(ELO2,5)**
CLO 2:	Relate neurotransmitters and their receptors with related clinical relationships	**(ELO2,5)**
CLO 3:	Describe the application of neural cell lines	**(ELO2,5)**

CLO 4: Describe mechanims of neuronal injury **(ELO2,5)**

CLO 5: Describe mechanisms of neuronal regeneration **(ELO2,5)**

CLO 6: Describe and give examples of experimental models of various neurological diseases **(ELO2,5)**

Section 5: Teaching and Assessment

	Content	CLO no.	T/L approach	Assessment Scheme
1	Introduction, Neural markers	**1**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
2	Neurotransmitters and their receptors	**2**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
3	Neural cell lines: neuronal, glial	**3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
4	Application of neural cell lines	**3**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
5	Mechanisms of neuronal injuries: oxidative stress, apoptosis	**4**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
7	Mechanisms of neuronal regeneration and synaptic plasticity	**5**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
8	Experimental models of neurological diseases: PD, AD, stroke, SCI	**6**	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and research papers	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
9	Paper discussion	**1,2,3,4,5,6**	Conference; Oral	-Evaluation of assignment,

	Content	CLO no.	T/L approach	Assessment Scheme
			presentation; Group discussion; Case study with ethical and moral issues	presentation and class participation

2. Evaluation plan.

Events	Learning Outcome	Assessment methods	The proportion of evaluation
1	1,2,3,4,5,6	- MCQ - Short essay	75%
2	1,2,3,4,5,6	- Paper assignment	20%
3	1,2,3	- Pretest and posttest	5%

Grading Criteria

80-100	A
70-79	B+
60-69	B

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

Course Syllabus

SCAN622 Human Embryonic Development

Name of Institute Mahidol University
Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN622 Human Embryonic Development

2. **Credits** 2 (2-0-4) Credits (lecture - practice - self-study).
3. **Course type**
   Elective course
4. **Course Coordinator**
   4.1 Course coordinator
      1. Dr. Krai Meemon
5. **Semester / Year of study**.
   Semester 1 / 1st year
6. **Pre-requisite courses**. none
7. **Co-requisite courses**. none
8. **Place** Department of Anatomy
9. **Last update.** July 28, 2560

Section 2: Aims of Course.

1. **Aims of Course**
   The course provides knowledge and skills involving
   1.1 gamete development process and development of the human embryo at an early stage.
   1.2 development of the embryo, placenta and membranes have.
   1.3 bone development, musculoskeletal system, nervous system, head and neck, ears, eyes and cardiovascular system, body cavity and respiratory system digestive system
   1.4 developmental abnormalities

Section 3 Course Description

1. **Description**
   Gametogenesis and early human embryonic development process; development of placenta and extraembryonic membrane; development of skeletal system; muscular system; nervous system; head and neck; eye and ear; cardiovascular system; body cavities and respiratory system; digestive system; urinary system; and reproductive system; developmental disorders and fetal anomaly

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1:	Describe gametogenesis and early human embryonic development	**(ELO2,5)**
CLO 2:	Describe placenta and extraembryonic membranes	**(ELO2,5)**
CLO 3:	Describe the developmetal process in musculoskeletal system, nervous system, head and neck, eye and ear, cardiovascular system,	**(ELO2,5)**

body cavity and respiratory system, digestive system, urogenital system

CLO 4: Describe the developmental disorders and fetal anomaly **(ELO2,5,7)**

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Gametogenesis, fertilization and implantation	1	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
2	The second to eight week of development	1	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
3	Fetus, placenta and prenatal diagnosis	2	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
4	Developmental disorders	4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
5	Development of integumentary and musculoskeletal system	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
6	Development of nervous system	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
7	Conference I: Early development in experimental model organism	1,2,3,4	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation
9	Development of head and neck	3,4	Lecture using Powerpoint; lecture handout; Discussion;	-Formative assessment (pre- and post-test) -Writen exam (Summative)

	Content	CLO no.	T/L approach	Assessment Scheme
			Suggested textbook and atlas	-Evaluation on class participation
10	Development of eye and ear	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
11	Development of body cavities and respiratory system	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
12	Development of cardiovascular system	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
13	Development of digestive system	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
14	Development of urogenital system	3,4	Lecture using Powerpoint; lecture handout; Discussion; Suggested textbook and atlas	-Formative assessment (pre- and post-test) -Writen exam (Summative) -Evaluation on class participation
15	Conference II: Developmental disorder	1,2,3,4	Self-study; Conference; Oral presentation; Group discussion; Case study with ethical and moral issues	-Evaluation of assignment, presentation and class participation

2. Evaluation plan.

Events	Learning Outcome	Assessment methods	The proportion of evaluation
1	1,2,3,4	- observation	10%
2	1,2,3,4	- written examination	60%
3	1,2,3,4	- assignment	30%

Grading Criteria

80-100	A
70-79	B+
60-69	B

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the instructor and / or course coordinator by contacting them directly by phone or email.

THESIS

Course Syllabus

SCAN698 Thesis

Name of Institute Mahidol University

Faculty / Department Faculty of Science Department of Anatomy

Section 1 Overview

1. **Course title and code** SCAN698 Thesis

2. **Credits** 12 (0-48-0) Credits (lecture - practice - self-study).
3. **Course type**
   Thesis
4. **Course Coordinator**
   4.1 Course coordinator
      1. Assoc. Prof. Dr. Kanokpan Wongprasert
5. **Semester / Year of study**.
   First and second semester / 2nd year
6. **Pre-requisite courses**. All required courses
7. **Co-requisite courses**. none
8. **Place** Department of Anatomy
9. **Last update.** July 28, 2560

Section 2: Aims of Course.

1. **Aims of Course**
   The course provides knowledge and skills involving
   1.1 research proposal design
   1.2 conducting research with concern of research ethics.
   1.3 analysis of the result and report the result in terms of thesis.
   1.4 presenting and publishing research
   1.5 researcher professional ethics

Section 3 Course Description

1. **Description**

Research proposal design in order to solve and develop educational organization, application of educational management theory with research, conducting research with concern of research ethics. Analysis of the result and report the result in terms of thesis. Presenting and publishing research in standard journals or a conference's proceedings and ethics in research presentation and researcher professional ethics

Section 4: Course Learning Outcomes

At the end of the course, the student will be able to:

CLO 1: Demonstrate honest, responsible, disciplined, and research conduct with ethical standards (ELO1,2,3)

CLO 2: Demonstrate acquired knowledge and comprehension of the research process and independent learning skills (ELO2,4,5,7)

CLO 3	Apply the relevant literature related to anatomy and structural biology to identify an up-to-date scientific research problem and develop an original research project	(ELO3,4,5)
CLO 4	Develop skills in designing a research plan and discipline specific research methodology in given frameworks	(ELO1,3,4)
CLO 5	Conduct research, collect, analyze and evaluate data in a systematic and theoretical context, make theoretical conclusions and a persuasive argument on which they are based	(ELO1,2,3,4)
CLO 6	Attributes of leadership and society membership in conducting research	(ELO5)
CLO 7	Demonstrate research collaboration with other co-workers, build a mutual teamwork and a good relationship with colleagues, receive and process feedback	(ELO5)
CLO 8	Demonstrate an ability to communicate the project objectives, results, discussion and conclusion and relevant knowledge in spoken English and written English (thesis report) to the academic scientific community in both national and international context	(ELO6,7)
CLO 9	Publish research findings in peer-reviewed proceeding journal	(ELO7)

Section 5: Teaching and Assessment

1. Plan

	Content	CLO no.	T/L approach	Assessment Scheme
1	Exploring related literature; Literature review; Research ethics and plagiarism;	**1,2**	Self-study; Discussion; Suggestion and comments; Advice for attending workshops on research ethics and plagiarism	-Evaluation during discussion -Report and thesis evaluation -Behavioral observation; -Records of assignment
2	Designing a research proposal; Creation of research objectives and hypotheses, including its benefits	**1,2,3,4**	Self-study; Discussion; Suggestion and comments;	-Evaluation during discussion -Report and proposal evaluation -Behavioral observation; -Records of assignment
3	Preparation of experimental tools and chemicals; Practicing of using experimental equipments	**4**	Self-study; Discussion; Suggestion and comments; Hand-on practise	-Report and proposal evaluation -Observation of practise; -Records of assignment
4	Conduction of a preliminary research for the direction and feasibility of the project; Good laboratory practise	**4,5**	Self-study; Discussion; Suggestion and comments; Hand-on practise; Handbook of good laboratory practise	-Report and proposal evaluation -Observation of practise; -Records of assignment
5	Writing a research proposal	**6**	Self-study;	-Report and proposal

	Content	CLO no.	T/L approach	Assessment Scheme
			Discussion; Suggestion and comments;	evaluation -Proposal examination
6	Conduction of research to achieve the objectives and hypotheses set	**3,4,5**	Self-study; Discussion; Suggestion and comments;	-Report evaluation -Observation of practise; -Records of assignment
7	Research collaboration and development of leadership in scientific community	**6,7**	Assignment; Group meeting;	-Behavioral observation; -Peer evaluation
8	Summary of research results; Mathematic and statistic analysis of data; Analyze, synthesize, and evaluate scientific results and problems	**5,7,8**	Self-study; Assignment; Discussion; Suggestion and comments; Symposium presentation	-Report evaluation -Observation of practise; -Records of assignment -Evaluation of symposium presentation
9	Reporting of the research progression	**6,7,8**	Self-study; Discussion; Suggestion and comments; Symposium presentation; Progress report	-Report evaluation -Observation of practise; -Records of assignment -Evaluation of symposium presentation
10	Writing the research reports for publication in proceeding journal and presentations in academic conferences	**8,9**	Self-study; Discussion; Suggestion and comments; Manuscript writing; Proceeding / abstarct / poster preparation	-Evaluation of manuscript -Evaluation of proceeding, abstract, and poster -Evaluation of presentation
11	Writing a thesis and preparation for a thesis defence	**8,9**	Self-study; Discussion; Suggestion and comments; Thesis writing;	-Evaluation of thesis -Evaluation at thesis defence

2. Evaluation plan.

Events	Learning Outcome	Assessment methods
1	1,2,3,4,5,8	- progress report - evaluation by advisors - evaluation at symposium - thesis report and defense
2	6,7	- evaluation by advisors - thesis report and defense
3	9	- paper accepted for publication

Grading Criteria

Pass (decision of Thesis Examination Committee)

Appeal Procedure

If students have any appeals regarding assessments or grades, they can immediately ask the advisors and / or Program Director by contacting them directly by phone or email.