课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	**课程名称 Course Title**	人体机能与药理学实验 Human Function and Pharmacology Laboratory
2.	**授课院系 Originating Department**	医学院 School of Medicine
3.	**课程编号 Course Code**	MED339
4.	**课程学分 Credit Value**	2
5.	**课程类别 Course Type**	专业基础课/Major Basic Courses
6.	**授课学期 Semester**	秋季 Fall
7.	**授课语言 Teaching Language**	中英 Chinese and English
8.	**授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation& Contact （For team teaching, please list all instructors）**	张婷，医学院，zhangt1@mail.sustech.edu.cn Ting Zhang, School of Medicine, zhangt1@mail.sustech.edu.cn 0755-88015577
9.	**实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact**	戴佳佳，南方科技大学医学院 daijj@mail.sustech.edu.cn Dai Jiajia, School of Medicine, Southern University of Science and Technology Email:daijj@mail.sustech.edu.cn
10.	**选课人数限额(可不填) Maximum Enrolment （Optional）**	

11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
	学时数 Credit Hours			64		64

12.	先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	MED104 生物医学基础
13.	后续课程、其它学习规划 Courses for which this course is a pre-requisite	待定/To be determined
14.	其它要求修读本课程的学系 Cross-listing Dept.	待定/To be determined

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

人体机能与药理学实验主要探讨机体的各种正常活动、异常变化以及药物与机体之间相互作用的规律和机制。人体机能学实验融合了生理学、病理生理学、药理学主干学科的理论知识与实验，形成一门包括生理学特征、病理生理学改变和药物治疗在内的系统化、整体化的综合实验学课程。与医学院现有“生物医学科学”和“临床医学”专业学生的专业核心课程《生理学》、《病理生理学》、《药理学》相辅相成，帮助学生构建完善的知识与实践体系。

The Human Function and Pharmacology Laboratory mainly explains a set of the normal activity patterns, abnormal changes and the interaction between drugs and an organism. The human mechanics experiment integrates the theoretical principles and experiments of physiology, pathophysiology and pharmacology, forming a systematic and integrated comprehensive experimental course including physiological characteristics, pathophysiology changes and drug therapy. This is complementary to physiology, pathophysiology and pharmacology, which are major core courses of students majoring in "biomedical science" and "clinical medicine" in the school of medicine, to help students build a complete disciplinary of knowledge and practice.

16. 预达学习成果 Learning Outcomes

本实验课程完成后，学生应掌握的实验原理与方法包括：

1）人体生理实验：刺激强度、刺激频率与人体肌肉反应的关系；人体动脉血压的测定及影响因素；人体呼吸运动的描记及影响因素；人体脑电的记录与观察；视觉诱发电位及人体眼动电位的记录；基础代谢与能量代谢。

2）动物实验：血细胞比容测定、离体小肠平滑肌收缩特性、糖尿病模型的抑郁行为检测；磺胺类药物血浆半衰期测定、不同的药物剂型及不同给药途径对药物作用影响以及糖皮质激素对大鼠足趾肿胀的抗炎作用。

By completing this laboratory course, the students should be familiar with the principles and experiment methods of :

1)Human Physiology Experiments: Relationship between stimulation intensity and frequency and human muscle response, Measurement of human arterial blood pressure and the influencing factors effects, Description of human respiratory movement and the Influence different factors effect, To record and observe human electroencephalogram, to record visual evoked potential and human eye movement potential, Basal metabolism and energy metabolism.

2) Animal Experiments: Hematocrit determination Assay, Observation of hepatocellular jaundice and Contractility of intestinal smooth muscle; Determination of plasma half-life of sulfonamides, The drug action effects of different dosage and administration routes, and anti inflammatory effect of glucocorticoid on toe swelling in rats.

17. 课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）
Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

实验一、课程介绍及实验室安全介绍

Lab 1: Course Introduction and Laboratory safety

介绍人体机能与药理学实验课程、机能学实验室、人体生理实验室安全指南、课程要求和评分标准。

Introduction of Human Functional Science and Pharmacology Laboratory course, functional laboratory and human physiology laboratory safety guidelines, course requirement and assessment criteria.

实验二、动物实验基本操作技术培训

Lab 2: Basic techniques training of animal experiment

动物的基本实验操作技术培训，包括抓取、保定、灌胃、皮下注射、腹腔注射、静脉注射、肌肉注射及采血。

Training of animal basic techniques including handling and restraint, oral gavage, subcutaneous injection, intraperitoneal injection, intravenous injection, intramuscular injection and blood withdrawal.

实验三、血细胞比容测定

Lab 3: Hematocrit determination assay

学习血细胞比容测定的原理与方法；观察全血的分层现象；理解血液组成成分及血液生理。

To learn the principle and method of hematocrit measurement; To observe the stratification of whole blood; To Understand blood composition and blood physiology.

实验四、离体小肠平滑肌收缩特性

Lab 4: Contractility of isolated intestinal smooth muscle in vitro

学习制备哺乳动物小肠平滑肌离体样本，并检测不同处理因素（NaOH/HCl/肾上腺素/去甲肾上腺素/乙酰胆碱/阿托品）对平滑肌生理活动的影响。

Learn how to prepare mammal's small intestine in vitro, to determine effect of hormones (NaOH / HCl / adrenaline / norepinephrine / acetylcholine/atropine) on smooth muscle motility.

实验五、泌尿系统：尿的生成与影响因素

Lab 5: Urine Formation and the factors affecting urine production

学习输尿管插管技术、尿量的记录和测量方法，观察神经、体液因素及药物对尿生成的影响

To learn the ureteral intubation, to record and measure urine volume; To observe the effects of nerve, humoral factors and drugs on urogenesis.

实验六、糖尿病模型的抑郁行为检测

Lab 6: Depressive behavior test in diabetic mouse models

在糖尿病小鼠与正常小鼠中，记录比较小鼠游泳时间（强迫游泳），观察小鼠的抑郁样行为。

To observe and record the swimming time (forced swimming) in diabetic mice and control mice, and to observe the depression like behavior in mice.

实验七、神经肌肉系统实验

Lab 7: Neuromuscular system experiment

刺激强度、刺激频率与人体肌肉反应的关系；神经传导速度的测定；握力与人体肌电。

Relationship between stimulation intensity and frequency and human muscle response; Measurement of motor nerve conduction velocity; Grip Strength and Electromyogram (EMG) Activity

实验八、循环系统实验

Lab 8: Circulation system experiment

人体动脉血压的测定及影响因素，观察不同时间点、不同活动状态下的人体体温、呼吸、心率和血压的变化；心电图的与心音描记。

Measurement of human arterial blood pressure and the influencing factors effects, To observe the changes in body temperature, respiration, heart rate and blood pressure at different time points and in different activity states; Electrocardiogram and phonocardiogram.

实验九、呼吸系统实验

Lab 9: Respiratory system experiment

人体呼吸运动的描记及影响因素：肺活量、潮气量、用力肺活量、二氧化碳生成量的测定。

Description of human respiratory movement and the Influence different factors effect; Determination of vital capacity, tidal capacity, forced vital capacity and carbon dioxide production.

实验十、中枢神经系统实验

Lab 10: Central nervous system experiment

记录和观察人体脑电图，并观察脑电图的基本波形，识别 α 波与 α 波的阻断现象。

To record and observe human electroencephalogram, to observe the basic waveform of electroencephalogram, and to recognize the human EEG α Wave and α Wave blocking phenomenon.

实验十一、感官系统实验

Lab 11: Sensory system

学习记录视觉诱发电位及人体眼动电位；学习记录视野范围，以及不同光照条件下的瞳孔对光反射现象。

To Learn how to record visual evoked potential and human eye movement potential; Learn to record the range of visual field, and to observe the pupillary light reflex under different light conditions.

实验十二、代谢系统

Lab 12: Metabolic system

基础代谢与能量代谢，掌握基础代谢率的间接测热法的原理和方法，学习测量能量代谢的间接测热法的原理和方法。

Basal metabolism and energy metabolism: To master the principle and method of indirect calorimetry of basal metabolic rate(BMR), Learn the principle and method of indirect calorimetry for measuring energy metabolism.

实验十三、磺胺类药物血浆半衰期测定

Lab 13: Determination of plasma half-life of sulfonamides

学习药物半衰期的测定方法，掌握药物血浆的临床意义。家兔耳缘静脉注射磺胺类药物，光吸收法测定血液磺胺嘧啶含量，计算磺胺类药物半衰期。

Learn the method of determination of drug half-life, master the clinical significance of drug plasma. sulfonamides was injected intravenously in the ear margin of rabbits. The content of sulfadiazine in blood was determined by light absorption method, and the half-life of sulfadiazine was calculated.

实验十四、不同的药物剂型及不同给药途径对药物作用影响

Lab 14: The drug action effects of different dosage and administration routes

小鼠灌胃不同剂量的戊巴比妥钠，观察小鼠正发射消失时间的差异；小白鼠经腹腔注射和灌胃观察硫酸镁的药效变化。

To observe the disappearance time difference of positive emission when mice were given different doses of pentobarbital sodium by gavage. To observe the drug action effect of different administration routes.

实验十五、糖皮质激素对大鼠足趾肿胀的抗炎作用

Lab 15: Anti inflammatory effect of glucocorticoid on toe swelling in rats

大鼠注射鸡蛋清致使足趾肿胀，建立免疫模型。腹腔注射糖皮质激素，观察糖皮质激素的抗炎作用。

To establish immune rats model by injection with egg-white to cause toe swelling. To observe the anti-inflammatory effect of glucocorticoid by intraperitoneal injection.

实验十六、实验回顾与汇报

Lab 16: Review and Presentation

Section	Topic	Hours
1	课程介绍及实验室安全介绍 Course Introduction and Laboratory safety	4
2	动物实验基本操作技术培训 Basic techniques training of animal experiment	4
3	血细胞比容测定 Hematocrit determination Assay	4
4	离体小肠平滑肌收缩特性 Contractility of isolated intestinal smooth muscle in vitro	4
5	尿的生成与影响因素 Urine Formation and the factors affecting urine production	4
6	糖尿病模型的抑郁行为检测 Depressive behavior test in diabetic mouse models	4
7	神经肌肉系统实验 Neuromuscular system experiment	4
8	循环系统实验 Circulation system experiment	4
9	呼吸系统实验 Respiratory system experiment	4
10	中枢神经系统实验	4

	Central nervous system experiment	
11	感官系统实验 Sensory system experiment	4
12	基础代谢与能量代谢 Basal metabolism and energy metabolism	4
13	磺胺类药物血浆半衰期测定 Determination of plasma half-life of sulfonamides	4
14	不同的药物剂型及不同给药途径对药物作用影响 The drug action effects of different dosage and administration routes	4
15	糖皮质激素对大鼠足趾肿胀的抗炎作用 Anti inflammatory effect of glucocorticoid on toe swelling in rats	4
16	实验回顾与汇报 Review and Presentation	4

教材及其它参考资料 Textbook and Supplementary Readings

参考教材：

1. 《药理学实验方法学》，魏伟主编，人民卫生出版社，2010.

2. 《机能实验学》，金春华， 科学出版社，2005.

3. 《机能实验学》第 3 版，杨芳炬，高等教育出版社，2015.

4. Experiments in Physiology. David A. Woodman and Gerald D. Tharp

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10		
课堂表现 Class Performance		20		
小测验 Quiz				
课程项目 Projects		20		Lab Notebook
平时作业 Assignments		30		Lab Report
期中考试 Mid-Term Test				
期末考试 Final Exam				

期末报告 **Final Presentation**		20		Group Oral Presentation
其它（可根据需要改写以上评估方式） **Others (The above may be modified as necessary)**				

20. 记分方式 **GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. **本课程设置已经过以下责任人/委员会审议通过**
This Course has been approved by the following person or committee of authority

本课程已经医学院分管教学副院长张文勇教授审核通过。