

Anat 870: Research Methods and Advanced Technology in biomedical research:
SYLLABUS Fall 2021

DESCRIPTION: Anat 870 is a 1 credit hour lecture course. ANAT 870 will meet weekly for one hour. Course content will consist of lectures by core speakers, student presentations, and discussions. Lectures by core speakers will be given on a monthly basis by experts (highlighted in the table below) this may include videos and/or hands-on demonstrations. At class meetings between outside core speakers, the facilitator will give students, the material to read or a student can come up with their best technique they know or they want to know in the lab and discussion will be carried out in the class. One student will present once a week and all students should come prepared for the discussion. Student-led presentations and discussions will occur on a rotational schedule, and along with class participation will serve as the basis for grading by facilitators. A facilitator can help the students understand a technique better if needed, using their own slides/ presentation or verbal comments. This course is designed to prepare our young scientists for future challenges by helping them to think broadly and learn how different novel techniques can be applied to different projects. Due to COVID restrictions lectures/classes may be online.

COURSE DIRECTOR & CONTACT INFO: Madhulika Sharma Ph.D.; Office: 6020G WHE; Lab: 6020C WHE; Phone: 913-945-9393; Email: msharma3@kumc.edu

TIME & PLACE: The official lecture meeting times for the speaker will be 10 AM to 11 AM on a Monday once a month (see highlighted area in the table below) starting September. In between these Mondays students will meet with a facilitator every Monday for one hour from 2 PM to 3 PM and will give presentations on approved new or recent techniques (selected by students or facilitator) and will lead discussions on the application of that technique. Most classes and lectures will be held in the Jared Grantham Conference room 6016 Wahl Hall East with few exceptions (see the schedule below).

REQUIRED READING: There is no required textbook for this course. However students will be required to search web for basics and very recent updates on many of the techniques that will be discussed in the class. Students will know ahead of time the title which the core speaker will be presenting (highlighted in the table below). They can read that topic and come prepared with questions. The same topic which the speaker presents may be discussed in the subsequent class meetings on the facilitator's discretion. Facilitators will provide material/ instructors to the students prior to each class which they will be expected to read and come prepared with.

GRADING & EVALUATION:

Student-led presentation and discussions will occur on a rotational schedule, and along with class participation will serve as the basis for grading by course directors. The students will be assigned a technique which they will come prepared with for a presentation in the class. Material for preparation of the technique will be provided by the facilitator. During presentation, they will be asked questions by the facilitator and other students. The instructor will correct the student if they find students not presenting the material correctly. The instructor can also provide more examples in between the presentations to make sure everyone understands the technique. Students will be graded based on the class discussions (40%) and presentations (50%). The use of additional, appropriate information sources that enhance the class's understanding of the topic may result in extra credit points (at the instructor's discretion).

LECTURE PRESENTATIONS AND DISCUSSION PARTICIPATION: At most class meetings, a student will take charge of a technique which will include the principal, why the technique is used, how to carry out the research with that technique and troubleshooting. Students are encouraged to contact their instructors at least a week prior to their Instructors/ facilitators so that the facilitator can provide an outline of the presentation. The number of lectures a student has to prepare per semester will be based on the number of students taking part in the course. On an average a student may be expected to give about 2-5

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presentations in a semester. A handout of the slide presentation must be provided at the start of each presentation.

COURSE OBJECTIVES:

Upon completion of the course, the student should be able to:

- 1) Describe and provide the rationale for most regular techniques used in research.
- 2) Compare and contrast two techniques which can lead to similar results.
- 3) Describe methods for most techniques that are discussed.
- 4) Have clear understanding of how a technique can be applied to a relevant project.
- 5) Identify appropriate and new techniques that can be applied to their projects
- 6) Use an appropriate technique in a grant application.
- 7) Think broadly in terms of their projects
- 8) Understand the importance of cutting edge techniques in biomed research

Students who believe they may need accommodations in this class are encouraged to contact [Cynthia Ukoko](#) in the Academic Accommodations Services Office (G020 Dykes) at 913-945-7035, as soon as possible to better ensure that such accommodations can be implemented in a timely fashion. Online appointments may also be made at <https://medconsult.kumc.edu>. For online information about academic accommodations, please visit the [Academic Accommodations](#) website.

Tentative schedule:

DATE	TOPIC	Facilitator/ core speaker	Time	location
Mon. August 30th	Introduction of the course and overview of recent advances in regular lab technique/techniques	Madhulika Sharma	2-3 pm	6016,WHE
Mon. Sept 13th	Genetically engineered mouse and iPS cell models of rare pediatric neurological disorders	Jay Vivian	10-11am	6016,WHE
Mon. Sept 27th	The facilitator will assign a research paper/article on CRISPRs to an assigned student for discussion	Stephen Parnell	2-3 pm	6016,WHE
Mon. Oct 4th	The Art of Science Imitating Life: Research Applications and Approaches for Micro-CT, DEXA and Histomorphometry	Peter Rowe	10-11 am	6016,WHE
Mon. Oct 25th	The facilitator will assign a research paper/article on microCT to an assigned student for discussion	Pamela Tran	2-3 pm	6016,WHE
Mon. Nov 1st	Overview of RNA techniques and Genomics available at the Genomics core (KUMC)	Clark Bloomer	10-11 am	6016,WHE
Mon. Nov 15th	The facilitator will assign a research paper/article on Genomics	Irfan Saadi	2-3 pm	6016, WHE

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	to an assigned student for discussion			
Mon Dec 6th	Exosomes: Uses in medicine and isolation techniques	Christopher Ward	10-11 am	6016,WHE
Mon. Dec 13th	The facilitator will assign a research paper/article on exosomes to a student for discussion	Madhulika Sharma	2-3 pm	6016,WHE
