

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>NEW COURSE PROPOSAL</b> <b>Graduate Programs</b>		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Biomedical Science College Medicine <i>(To obtain a course number, contact <a href="mailto:erudolph@fau.edu">erudolph@fau.edu</a>)</i>		
Prefix <b>GMS</b> Number <b>6091</b>	<i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i> Lab Code <b>C</b>	Type of Course <input checked="" type="checkbox"/> Lecture/Lab	Course Title Biomedical Science Core Technologies Laboratory
Credits <i>(Review Provost Memorandum)</i> <b>3</b>	Grading <i>(Select One Option)</i> Regular <input checked="" type="radio"/> Sat/UnSat <input type="radio"/>	Course Description <i>(Syllabus must be attached; see <a href="#">Guidelines</a>)</i> The aim of this course is to provide students with the introductory skills required for research success in the biomedical sciences. The course will combine traditional classroom-based learning with hands-on practical laboratory experience and instruction. This course will provide students with the fundamentals required for biomedical science research including: responsible conduct in biomedical research, understanding and application of the scientific method, hypothesis construction and experimental application, experimental design and data collection, data analysis and presentation.	
Effective Date <i>(TERM &amp; YEAR)</i> <b>Fall 2018</b>	Prerequisites NONE		Corequisites NONE
		Registration Controls <i>(Major, College, Level)</i> Instruction Permission Required	
<i>Prerequisites, Corequisites and Registration Controls are enforced for all sections of course</i>			
Minimum qualifications needed to teach course: Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.)		List textbook information in syllabus or here	
Faculty Contact/Email/Phone Dr. Lisa Brennan; Tel: 561 297 3806; <a href="mailto:lbrenna6@health.fau.edu">lbrenna6@health.fau.edu</a> Dr. Wen Shen; 561 297 0639; <a href="mailto:wshen@fau.edu">wshen@fau.edu</a>		List/Attach comments from departments affected by new course	

<b>Approved by</b> Department Chair <u>Janet Robshaw</u> College Curriculum Chair <u>Janet Robshaw</u> College Dean <u>Phyllis M. V.</u> UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____	<b>Date</b> <u>6/1/18</u> <u>8/10/18</u> <u>6/4/18</u> _____ _____ _____ _____
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Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) one week before the UGPC meeting.

## Biomedical Sciences Core Technologies Laboratory

### Instructors:

Dr. Lisa Ann Brennan  
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Dr. Wen Shen  
Office: BC-71, Room 229,  
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**Course Code:** PCB 6933

**Credit:** 3cr

**Room No:** Lab 217

**Class Times:** May 15<sup>th</sup> – June 22<sup>nd</sup> 2018. Tuesdays and Thursday 1.15pm - 4.25pm

**Office Hours:** Dr. Brennan - Mondays and Wednesdays 11am-12pm or by appointment  
Dr. Wen Shen - By appointment

**Textbook and Materials:** None required

**Course registration and enquiries:** Ms Bridget Statler, Office of Graduate Programs

**Course requirements:** Previous coursework and laboratory course experience in biology, biochemistry and/or cell biology and permission of instructor.

### Course Description:

The aim of this course is to provide students with the introductory skills required for research success in the biomedical sciences. The course will combine traditional classroom-based learning with hands-on practical laboratory experience and instruction. This course is divided into six sections taught over six weeks. The first two weeks of the course will provide students with the fundamentals required for biomedical science research including: responsible conduct in biomedical research, understanding and application of the scientific method, hypothesis construction and experimental application, experimental design and data collection, data analysis and presentation, scientific ethics and academic integrity and others. The following 4 weeks of the course will be dedicated to learning essential experimental skills required for success in biomedical research including: recombinant cell culturing techniques, recombinant DNA technology, gene expression analysis, analysis of proteins, enzyme-linked immunoassays, western analysis, immunohistochemistry, microscopy and biomedical imaging and other critical applications in biomedical science.

### Learning outcomes

On successful completion of the course, students will:

1. Understand research ethics, academic integrity and best practices for biomedical research.
2. Understand and apply the scientific method to form logical and testable hypotheses.
3. Master the principals of experimental design including use of experimental rigor, design of appropriate controls and secondary hypothesis formulation.

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4. Understand core technologies of the modern biomedical research laboratory including cell culturing techniques, recombinant DNA technology, gene expression analysis, antibody-based assays and biomedical imaging.

5. Master laboratory record keeping skills, data processing, data formatting and data presentation.

6. Understand the principals of academic integrity including experimental documentation, use of appropriate references, avoidance of plagiarism and scientific authorship.

**Course Schedule:**

Tuesday 15 <sup>th</sup> May	Introduction to the Biomedical research	Review Syllabus Lab safety/Responsible conduct in research (RCR) Pipetting/Notebooks. Scientific measurements – SI units. Buffer prep - molarity, pH. Reagent and sample handling.	Dr. Brennan
Thursday 17 <sup>th</sup> May	Introduction to the Biomedical research	The scientific method. Forming a hypothesis. Experimental design. Models in biomedical research. Data collection and presentation.	Dr. Brennan
Tuesday 22 <sup>nd</sup> May	DNA	Theory: Methods in DNA analyses, PCR, Techniques based on PCR Practice: Detection of the human PV92 ALU insertion - DNA extraction, DNA electrophoresis	Dr. Brennan
Thursday 24 <sup>th</sup> May	DNA	Theory: Large scale DNA analysis - GWAS/PheWAS Practice: STR PCR, DNA Fingerprinting	Dr. Brennan
Tuesday 29 <sup>th</sup> May	RNA	Theory: Gene expression analysis, Practice: RNA extraction, primer design, RT-PCR	Dr. Brennan
Thursday 31 <sup>st</sup> May	RNA	Theory: Large scale transcript analyses - RNAseq Practice: RT-qPCR, RNAseq database analysis	Dr. Brennan
Tuesday 5 <sup>th</sup> June	Protein	SDS PAGE and Western blot	Dr. Shen
Thursday 7 <sup>th</sup> June	Protein	Enzyme assays ELISAs	Dr. Shen
Tuesday 12 <sup>th</sup> June	Cells	Cell culture, Viability assays	Dr. Shen
Thursday 14 <sup>th</sup> June	Cell	Cell histology, H& E staining	Dr. Shen
Tuesday 19 <sup>th</sup> June	IHC/ microscopy	Principles of confocal microscopy	Dr. Shen
Thursday 21 <sup>st</sup> June	IHC/ microscopy	Examination of stained cells using Zeiss LSM700	Dr. Shen

**Assignments:**

Students will keep a laboratory notebook detailing experiments performed in each lab. It is student's responsibility to ensure their reports do not have plagiarized materials that are copied and pasted from the textbook or handouts.

Each lab will have a quiz based on both the conceptual and practical elements of the course.

**Course Grading:**

Laboratory participation 30%

In lab quizzes 20%

Laboratory Reports 50%

**Course Policies:** Participation is required for every lab class. Missing class, changing presentation dates and/or missing exams is not allowable without prior approval of the instructor and an approved physician's letter or a letter of conflict from an approved University Official to attend a mandatory University-approved activity.

**Classroom/Lab etiquette:** Please refer to the FAU Catalog and Student Handbook. Compliance with university rules and regulations is expected of all students.

**Academic Honor Code:** Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility.

The FAU Honor Code requires a faculty member, student, or staff member to notify an instructor when there is reason to believe an academic irregularity is occurring in a course. The instructor must pursue any reasonable allegation, taking action where appropriate. The following constitute academic irregularities:

1. The use of notes, books or assistance from or to other students while taking an examination or working on other assignments, unless specifically authorized by the instructor, are defined as acts of cheating.
2. The presentation of words or ideas from any other source as one's own is an act defined as plagiarism.
3. Other activities that interfere with the educational mission of the University.

For full details of the FAU Honor Code, see University Regulation 4.001 at [www.fau.edu/regulations/chapter4/4.001\\_Honor\\_Code.pdf](http://www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf).

**Students With Disabilities:** In compliance with the American Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Student Accessibility Services – in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all SAS procedures.

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***Course developed by Drs. Lisa Brennan and Wen Shen, Department of Biomedical Science, College of Medicine, FAU***