PHYS 3310: Radiation Biophysics (3 credit hours)

**Instructor:** Dr. HyeongJun Kim  
* Assistant Professor in the Department of Physics and Astronomy  
* Email: hyeongjun.kim@utrgv.edu  
* Phone numbers: To be announced (office in the Edinburg campus)  
  956-665-2531 (Emergency number – Department office in Edinburg)  
  956-882-6679 (Emergency number – Department office in Brownsville)  
* Office: ESCNE 3.136 (Edinburg)

**Teaching Assistant:** Ms. Fatemeh Mostafavikhatam  
* Graduate Student in the Department of Physics and Astronomy  
* fatemeh.mostafavikhatam01@utrgv.edu

**Locations:** BSABH 2.204 (Brownsville) and EEDUC 1.404 (Edinburg)

**Hours (Lecture):** MW 10:50 AM - 12:05 PM

**Office Hours/Locations**  
* Monday 1:30 PM - 2:45 PM at ESCNE 3.136 (Building #31 in the Edinburg campus map)  
* Wednesday 2:00 PM – 3:15 PM at BLHSB 1.418 (Building #6/7 in the Brownsville campus map)  
* By appointments

**Course Information**  
* This is an advanced course in radiation biophysics. It will cover radiation chemistry, radiation carcinogenesis, genetic effect of ionizing radiation, metabolism and biological effects of deposited radionuclides, radiation inactivation of enzymes, nucleic acids and viruses, biological effects of ultraviolet radiation, photosensitization, radiation protection and sensitization, radiation effects in vivo, cancer radiation therapy and phototherapy.  
* Prerequisites: PHYS 1402 (General Physics II) or PHYS 2426 (Physics for Scientists and Engineers II)  
  (now Elsevier)  
  (Print ISBN: 9780120530854)  
  (Available from campus bookstores or [http://www.elsevier.com](http://www.elsevier.com) or other online booksellers)  
* Students will need **calculators** for homework and exams.  
* This course will be given via ITV method. Unless otherwise mentioned in the class, Dr. Kim will teach in the Edinburg campus on Mondays (while students in the Brownsville campus watch the class on TV) and in the Brownsville campus on Wednesdays (while students in the Edinburg campus watch it on TV).

**Course Objectives**  
* Recognize how electromagnetic radiation or charged particles interact(s) with matters.  
* Understand how modern electromagnetic radiation theories have been established.  
* Realize the role of DNA as the primary target for the effects of ionizing radiation on biological systems.  
* Understand that ionizing radiation can cause DNA damage and recognize that cells have a capability of fixing the damage via multiple repair pathways.  
* Differentiate between the effects of ionizing radiation on prokaryotic and eukaryotic systems.  
* Investigate the ways that ionizing radiation can influence the fidelity of DNA replication and chromosomal stability.
* Differentiate between the effects of low-LET and high-LET radiation on biological systems.
* Examine how radionuclides can get into biological systems and what will happen to them.
* Evaluate a radiation biophysics-related journal paper.

**Homework/Grading Policies**

* Homework schedule will be announced in the final version of syllabus.
* Homework will be collected in the classrooms by Dr. Kim and TA.
* Late homework will be accepted until graded homework is returned. Note that there will be score penalty per each day for the late assignment. If you missed a homework due, please take a picture of your homework or scan it, then email it to Dr. Kim (hyeongjun.kim@utrgv.edu) with “[PHYS 3310]” in the subject line.
* In addition to excuses mentioned in the “ATTENDANCE” part in the next page, under extraordinary circumstances (e.g. sudden illness), additional chance for missed homework deadline may be given. Please try your best to inform Dr. Kim of the situation as soon as possible, and arrange necessary steps for justification (e.g. doctor’s note for illness), if it is do-able. Dr. Kim will determine the validity of the excuses.

* Grading Scale
  
  Two quizzes: 10%  
  Homework: 30%  
  A mid-term exam (Date: will be announced): 25%  
  The final exam (Date: May 7, Monday, 10:15 AM – 12:00 PM): 35%  

* Grading policy

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Letter grade</th>
<th>GPA</th>
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<tbody>
<tr>
<td>90 – 100</td>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>80 – 89</td>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>70 – 79</td>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>60 – 69</td>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>Less than 60</td>
<td>F</td>
<td>0.0</td>
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* Important concepts that will be helpful in the test will be emphasized during classes. That is another reason why you need to attend all classes. Go over graded homework and their solutions, and try to fully understand the answer keys before tests.

**Calendar of Activities**

<table>
<thead>
<tr>
<th></th>
<th>First day of the PHYS 3310 classes</th>
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<tbody>
<tr>
<td>January 17th</td>
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<tr>
<td>January 19th</td>
<td>Last day to add a course or register for spring 2018</td>
</tr>
<tr>
<td>March 5th</td>
<td>Mid-term exam.</td>
</tr>
<tr>
<td>March 12-17</td>
<td>Spring break – NO classes</td>
</tr>
<tr>
<td>April 12th</td>
<td>Last day to drop a course; will count toward the 6-drop rule</td>
</tr>
<tr>
<td>May 2nd</td>
<td>Last day of classes</td>
</tr>
<tr>
<td>May 4th-10th</td>
<td>Spring 2018 final exams</td>
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**SPECIAL NOTES**

**STUDENTS WITH DISABILITIES**

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS
at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services. **Brownsville Campus: Student Accessibility Services** is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

**Mandatory Course Evaluation Period**

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:

- Spring 2018 Module 1  February 14 – February 20
- Spring 2018 Module 2  April 11 – April 17
- Spring 2018 (full semester)  April 11 – May 2

**Attendance**

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holydays; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**Scholastic Integrity**

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**Sexual Harassment, Discrimination, and Violence**

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination.

**Course Drops**

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

**Student Services**
Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Learning Center, Writing Center, Advising Center and Career Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

- Learning center: BSTUN 2.10 (Brownsville) or ELCTR 100 (Edinburg)
- Writing center: BLIBR 3.206 (Brownsville) or ESTAC 3.119 (Edinburg)
- Advising center: BMAIN 1.400 (Brownsville) or ESWKH 101 (Edinburg)
- Career center: BCRTZ 129 (Brownsville) or ESSBL 2.101 (Edinburg)

**ADDITIONAL CLASS RULE**
Cell phone use is strictly forbidden.