VIROLOGY
BIOL 4422 (Lecture) and BIOL 4022 (Lab)

Course description
Basic study of viruses with laboratory. Covers viral structure, genome organization, replication strategies, viral classification, and medical implications of viral infections. Techniques used in modern virology will be elaborated. Laboratory part will be project-based and it will include isolation, propagation, and characterization of bacteriophages.

Basic information about course
Professor: Dr. Željko Radulović
Meeting times: Tuesdays and Thursdays, 9.30 am – 10.45 am (lecture)
Tuesdays and Thursdays, 11.00 am – 12.15 pm (lab)
Location: E. L. Miller Science Building, room 216
Prerequisites: BIOL 3421 (Microbiology for Science Majors) and BIOL 3453 (Genetics)

Materials
PowerPoint presentations for each lecture will be uploaded in Brightspace (D2L) before class, according to the provided schedule of the course, so that students can follow the material and make notes easier.
Textbook: Textbook IS NOT required for this course. However, if you prefer to have a textbook, the recommended one is:
Lab requirements: For lab work students are required to have a lab coat, long pants or skirts, and closed-toe shoes. Having a notebook for recording laboratory work is strongly recommended.
About your professor

Office: E. L. Miller Science Building, room 202
Phone: 936-468-6619
E-mail: Zeljko.Radulovic@sfasu.edu
Office hours: Mondays, 12.00 pm – 1.00 pm
Tuesday, 1.00 pm – 4.00 pm
Wednesday, 12.00 pm – 1.00 pm

Short biography:
I completed my BS, MSc, and PhD in Biology at University of Belgrade in Serbia. Professional career I started at Institute for Medical Research in Belgrade, where I studied arthropod vectors and pathogenic microorganisms they transmit. After graduation with PhD, I moved to United States and spent six years as a postdoc at Texas A&M University working on molecular mechanisms of tick feeding and pathogen transmission. In 2017 I became an assistant professor at Northwestern State University, where I stayed for three years teaching courses in the field of microbiology, genetics, and molecular biology. Starting from the fall semester of 2020, I am assistant professor in Department of Biology at Stephen F. Austin State University.

Research interest:
Focus of my research program is on arthropod vectors and vector-borne microorganisms. Current research projects are related to ticks and include molecular detection of pathogenic microorganisms in locally collected tick specimens using PCR-based methods, isolation and characterization of tick-borne microorganisms, as well as determination of genetic structure of different tick populations.

Other interests:
I enjoy fishing, gardening, and playing tennis, basketball or soccer. Also, I am a big fun of „Crvena Zvezda“ (Red Star Sports Society located in Belgrade, Serbia), and use every opportunity to attend games of Red Star soccer and basketball teams. Choreographies and noise made by Red Star supporters, make the atmosphere in these games to be ranked among the best worldwide. Living far from Serbia right now, I still enjoy watching these games on TV.
### Course calendar (lectures):

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tue, Aug 24th, Thu, Aug 26th</td>
<td>Introduction to virology, Review – biomolecules and cell structure</td>
</tr>
<tr>
<td>2</td>
<td>Tue, Aug 31st, Thu, Sep 2nd</td>
<td>Review – basics of molecular genetics, Review – basics of molecular genetics</td>
</tr>
<tr>
<td>3</td>
<td>Tue, Sep 7th, Thu, Sep 9th</td>
<td>Virion structure, Classification of viruses</td>
</tr>
<tr>
<td>4</td>
<td>Tue, Sep 14th, Thu, Sep 16th</td>
<td>Replication of viruses – adsorption, penetration, and uncoating, Replication of viruses – biosynthesis</td>
</tr>
<tr>
<td>5</td>
<td>Tue, Sep 21st, Thu, Sep 23rd</td>
<td>Replication of viruses – biosynthesis, Replication of viruses – assembly and release</td>
</tr>
<tr>
<td>6</td>
<td>Tue, Sep 28th, Thu, Sep 30th</td>
<td>Test 1, Persistence and transmission of viruses</td>
</tr>
<tr>
<td>7</td>
<td>Tue, Oct 5th, Thu, Oct 7th</td>
<td>Host-virus interactions at cellular level, Types of viral infections</td>
</tr>
<tr>
<td>8</td>
<td>Tue, Oct 12th, Thu, Oct 14th</td>
<td>Host-virus interactions – immunity and interactions, Host-virus interactions – immunity and interactions</td>
</tr>
<tr>
<td>9</td>
<td>Tue, Oct 19th, Thu, Oct 21st</td>
<td>Prevention of viral diseases, Antiviral therapy</td>
</tr>
<tr>
<td>10</td>
<td>Tue, Oct 26th, Thu, Oct 28th</td>
<td>Test 2, Selected viral diseases of humans</td>
</tr>
<tr>
<td>11</td>
<td>Tue, Nov 2nd, Thu, Nov 4th</td>
<td>Selected viral diseases of humans, Selected viral diseases of humans</td>
</tr>
<tr>
<td>12</td>
<td>Tue, Nov 9th, Thu, Nov 11th</td>
<td>Selected viral diseases of humans, Viruses and tumor development</td>
</tr>
<tr>
<td>13</td>
<td>Tue, Nov 16th, Thu, Nov 18th</td>
<td>Laboratory techniques for studying and using viruses, Test 3</td>
</tr>
<tr>
<td>14</td>
<td>Tue, Nov 23rd, Thu, Nov 25th</td>
<td>Thanksgiving Holiday</td>
</tr>
<tr>
<td>15</td>
<td>Tue, Nov 30th, Thu, Dec 2nd</td>
<td>Review session, Review session</td>
</tr>
<tr>
<td>16</td>
<td>Thu, Dec 9th, 8 AM</td>
<td>GROUP DISCUSSION</td>
</tr>
</tbody>
</table>

Lab will be project-based and schedule of activities will depend on individual project progress. Key dates for the Lab part of the course are:

- October 14th, 2021 – Presentation on project progress
- December 2nd, 2021 – Final project presentation
- December 3rd, 2021 – Submission of lab project report

NOTE: Slight variations from the proposed calendar are possible during the course.
**Course goal and student learning outcomes**

This course will cover diversity of viral structures and replication strategies, as well as medical importance of viruses. The main goal of this course is that students understand interactions between viruses and their hosts at cellular and organismal level. After completion of this course students should be able to:

- Explain structure of viral particles;
- List different types of genetic material that viruses can contain;
- Describe stages of viral replication;
- Explain different strategies of replication of genetic material of viruses;
- Describe immune response triggered by viral infections;
- Describe different types of viral infections at cellular and organismal level;
- List common ways of transmission of viral diseases;
- Describe different types of vaccines used in prevention of viral diseases;
- Explain use of common antiviral drugs;
- Describe the most important viral diseases in humans;
- Perform isolation, propagation, and characterization bacteriophages.

Each of the student learning outcomes listed above address the Biology Department Program Learning Outcome #1: Demonstrate a good knowledge base in biological concepts and be able to integrate knowledge with critical thinking skills to become problem solvers. Knowledge base will include: levels of complexity (molecular/cellular through population/communities/ecosystems); biological principles and processes.

**Course credit hour justification**

This is a 4 credit hours course, which includes the lecture part with 150 minutes of direct instructions per week that include traditional lecture delivery, active and flipped learning activities, and assessments, and laboratory part with 150 minutes of practical work that includes planning and performing experiments, collecting and analyzing data, and presenting obtained results. In addition, around 6 hours per week of out-of-class activities is expected from students in order to successfully accomplish all course requirements. This includes preparation for classes, review of literature or class material, work on out-of-class assignments (student papers and presentations), etc.
**Student assessments**

During this course students will be assessed by:

- **Tests** – 3x150 points (45% of the final grade)
- **Student presentation** – 1x100 points (10% of the final grade)
- **Student paper** – 1x100 points (10% of the final grade)
- **Lab project progress presentation** – 1x50 points (5% of the final grade)
- **Lab final project presentation** – 1x100 points (10% of the final grade)
- **Lab project report** – 1x100 points (10% of the final grade)
- **Group discussion** - 1x100 points (10% of the final grade)

**Test make-up policy:**
To make-up missed test students need to provide a university approved excuse. All make-up tests will be oral exams.

**Late assignment submission and presentation delivery:**
Late assignment submissions and presentation delivery will be accepted with penalties, according to rubrics provided for the assessment.

**Grading scale**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>900+ points</td>
<td>(90-100 %)</td>
</tr>
<tr>
<td>B</td>
<td>800-899.99 points</td>
<td>(80-89.99 %)</td>
</tr>
<tr>
<td>C</td>
<td>700-799.99 points</td>
<td>(70-79.99 %)</td>
</tr>
<tr>
<td>D</td>
<td>600-699.99 points</td>
<td>(60-69.99 %)</td>
</tr>
<tr>
<td>F</td>
<td>0-599.99 points</td>
<td>(0-59.99 %)</td>
</tr>
</tbody>
</table>

**NOTE:** Students that miss 5 or less points (<0.5%) to the upper letter grade at the end of the course, will have an opportunity to improve their final grade. First, they need to contact me in a short period of time between the moment I post all grades in the Brightspace and the deadline for the final grades submission. The second, these students will take a short oral exam as an opportunity to improve their final grade.

**COVID-19 recommendations**

Application of all recommendations related to control of COVID-19 pandemic issued by CDC, including vaccination, physical distancing, wearing of face coverings, and hand washing, is strongly encouraged, but not required.
SFA policies

Academic Integrity (A-9.1)

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/student-academic-dishonesty-4.1.pdf

Withheld Grades Semester Grades Policy (A-54)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. To receive a WH, the student must have completed a majority of the course. If a WH is given, students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.