

**Title: Viruses of Fish (CRN: VIR-3182). Course policy and welcome notes.**

**Date: Thursday, March 30, 2023.**

**Author and course coordinator: Ausama A. Yousif, DVM, MSc, PhD. Professor of virology.**

**Dear future colleagues,**

Egypt's fish farming industry is growing rapidly. There is great potential for more growth in the fish farming industry because of the abundance of water bodies in Egypt. However, fish farming conditions are often conducive to the spread of disease. Pathogens that would normally exist in relatively low levels in wild fish populations are problematic in densely packed fish farms. Viruses causing clinical or subclinical infections of marine and freshwater fish and crustacean aquacultures have a negative impact on the economics of production and national food security.

Members of more than thirteen virus families have been identified in wild and cultured fish and crustaceans worldwide. These virus families include *Adenoviridae*, *Herpesviridae*, *Rhabdoviridae*, *Birnaviridae*, *Picornaviridae*, *Iridoviridae*, *Retroviridae*, *Reoviridae*, *Togaviridae*, *Orthomyxoviridae*, *Amnoonviridae*, and *Nodaviridae*. However, there is currently limited information about viruses infecting Egyptian fish and crustacean populations. This knowledge gap can be filled using a discovery-oriented research system. The type and spread of viruses of aquatic species in Egypt, combined with an understanding of fish and crustacean ecology and immunology, will help reduce the impact of possible outbreaks of these viruses in economically important cultured species.

During this semester, we will be discussing the physicochemical and biological properties of key viruses responsible for severe infections of marine and freshwater fish and crustaceans. However, our focus will be on how each property can help in the development of diagnostic and control tools and strategies. In other words, I will try to translate the basic aspects of virology into usable tools to help you make the Egyptian aquaculture "Bioshield" stronger. Enjoy!

### **Course objectives**

On completion of this course, graduate students should have a working understanding of:

1. The physicochemical and biological properties of key viruses responsible for severe infections of marine and freshwater fish and crustaceans.
2. How these viruses spread and replicate in immunocompetent fish and/or crustacean tissues.
3. Basic tools available for the diagnosis of viruses infecting marine and freshwater fish and crustaceans.
4. The design of a discovery-oriented research system for the identification of viruses infecting marine and freshwater fish and crustaceans in Egypt.
5. Available interventions for the control of marine and freshwater fish and shrimp viruses.

### **Course Requirements and Policy**

1. Teaching, exams, and reports will be in English.
2. The course format is based on discussion of key papers related to the science.
3. You will be given guidance how to get the course material early in the course. You are required to read it. Several exam questions will involve concepts discussed in the journal articles assigned to you.
4. You are required to make a short scientific review\* on any virus infecting marine and freshwater fish and crustaceans. However, you can prepare a 5-slide presentation on 6 viruses infecting marine and freshwater fish and crustaceans instead. If you chose the latter option, you will be required to present the slides you have prepared on one of the viruses at the beginning of every lecture until you have presented on all 6 viruses. Topics related to the community will be favored.
5. You are required to devise a one-page experimental design\* to attempt solving one of the problems you see relevant to the topic you have reviewed.

6. There will be two pop exams\* to access what you really absorbed during our contact and to determine what needs to be done to improve the outcome of your learning activities. The exams are not mandatory; however, your scores in these exams will be added to your total sum in the form of extra-credit points. Please, take them seriously.
7. Practical aspects of the science will be discussed during our weekly meeting.
8. Plagiarism is prohibited and will not be tolerated. The simplest description of plagiarism is defined by “claiming that something is yours while it is the work and thought of someone else”. You MUST think, write using your own style, and reference people that have helped you create your own ideas and style. YOU WILL FAIL IF YOU COMMIT PLAGIARISM.

### Course materials

#### Required course material:

1. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-manual-online-access/>  
Chapters 2.2.8., 2.3.7., 2.3.9.
2. <https://doi.org/10.1016/j.aquaculture.2019.01.036>.
3. <https://doi.org/10.1007/s10499-020-00559-4>.
4. <https://doi.org/10.3390/ani11113032>

#### Good reads:

1. <https://doi.org/10.1111/raq.12192> (highly recommended).
2. <https://shrimpdiseases.wordpress.com/imn/>
3. [https://www.cfsph.iastate.edu/Factsheets/pdfs/epizootic\\_hematopoietic\\_necrosis.pdf#:~:text=Epizootic%20hematopoietic%20necrosis%20%28EHN%29%20is%20a%20systemic%20iridoviral,survival%20in%20the%20environm ent%20and%20resistance%20to%20disinfectants](https://www.cfsph.iastate.edu/Factsheets/pdfs/epizootic_hematopoietic_necrosis.pdf#:~:text=Epizootic%20hematopoietic%20necrosis%20%28EHN%29%20is%20a%20systemic%20iridoviral,survival%20in%20the%20environm ent%20and%20resistance%20to%20disinfectants).

#### Contact information:

E-mail: [ausama\\_yousif@cu.edu.eg](mailto:ausama_yousif@cu.edu.eg) (Do not use the phone except in emergencies).

#### \*Activities and % of final grade:

Activity	Objective	% of grade
Short Report/Presentations.	Practice scientific communication skills. Encourage creative thinking. Practice reporting and organization.	10%
Experimental Design (written).	Encourage creative thinking. Practice reporting and organization.	10%
Discussion of assigned journal articles (#=4)/ORAL	Measure student progress. Measure course progress.	10%
Laboratory Exam	Measure ability to apply practical knowledge.	20%
Final Exam	Measure student outcome, and rank students.	50%
Pop test 1	Encourage regular study, creative thinking.	Extra Credit 2.5%
Pop test 2	Encourage regular study, creative thinking.	Extra Credit 2.5%

End