**Grassy University of Santo Tomas (GUST)**

**STEM Professor Jodel Carlyle P. Deauna, M.D., M.O.H.**

**numbers115@aol.com**

**Spring 2024**

**Evolutionary Medicine 101**

**FOR GLOBAL FARMER-ENGINEERS, FOR GLOBAL STEM MAJORS, and FOR MY GLOBAL DESCENDANTS**

**“Free”**

**Course Description**

This course provides the Global Farmer-Engineers, Global STEM MAJORS, and my Global Descendants, with an introduction to Evolutionary Medicine, with an introduction to hazards and controls of the COVID virus and other viruses and with an introduction to the Numbers11:5 Health Plan application related to Farmer-Engineering, leading to more efficient food production.

**Textbook and Supplemental Materials**

* Academic Lectures of **Professor Deauna**
* Open Educational Resources (funded by **Bill Gates**)
* Any College Level Biology Textbook or Evolutionary Medicine Textbook for Medicine

**Equipment**

Computer with Internet Access

**Course Objectives**

Upon completion of the course:

* The Global Farmer Engineers should be able to identify the basic characteristics of life and outline the Evolutionary Medicine theories that attempt to explain the origin of life.
* The Global Farmer Engineers should be able to identify hazards and control the hazards by applying Engineering Control, Administrative Control, and use of Personal Protective Equipment.
* The Global Farmer Engineer should be able to apply the concepts related to the Numbers11:5 Health Plan in the maintenance of health.
* The Global Farmer Engineers should be able to identify some basic chemical concepts and apply them to the structural and Evolutionary Medicine processes that occur in the living cells.
* The Global Farmer Engineers should be able to identify cell parts, and demonstrate understanding of their related functions relevant to farmer-engineering.
* The Global Farmer Engineers should be able to explain the significance of enzymes, coenzymes, and ATP with regards to Evolutionary Medicine Concepts.
* The Global Farmer Engineers should be able to apply the laboratory skills associated with the objectives listed above.
* The Global Farmer Engineers should be able to explain the basic concepts of Evolutionary Medicine in oral and written forms.
* The Global Farmer Engineers should be able to apply the concepts learned to better understand the world using Evolutionary Medicine Concepts and use those concepts to produce food for all.

**Objectives for the week**

Upon completion of the Activities For This Week, you should be able to

* + describe the levels of Evolutionary Medicine organization of an organism.
  + identify the characteristics of living organisms with relevance to Evolutionary Medicine.
  + describe elements and how elements are combined to form molecules.
  + describe the importance of water and how it is related to Evolutionary Medicine.
  + identify the four hazards—physical, chemical, biological, and ergonomics.
  + control the different hazards using Engineering Control, using Administrative Control, and using Personal Protective Equipment.
  + understand plant cells and animal cells.
  + understand what cell theory is.
  + describe the Numbers11:5 Health Plan according to the properties and characteristics of carbohydrates, fats, and proteins.
  + describe the theory of endosymbiosis and correlate the theory of endosymbiosis with the concept of altruism according to Evolutionary Medicine.
  + understand compartmentalization in cells and understand how it is related to Engineering Control.
  + compare and contrast the mitochondria and the chloroplasts in a cell.
  + explain the Physics of ATP and the concepts of potential energy and kinetic energy in relation to the movement in a cell.
  + describe the Physics of the First Law of Thermodynamics and the Second Law of Thermodynamics.
  + describe how ATP evolved as an energy carrier in an organism.
  + write a Binary Project Paper on Photosynthesis.
  + compare and contrast photosynthesis and cellular respiration.

**Delivery and Netiquette**

As an online course, the Farmer-Engineers should understand the importance of scheduling, and work in a timely and professional manner with their binary and their squad if there is one. The binary should accomplish the work together before 2000 Hours on the Fridays of each week. The binary should follow the military netiquette in our online course. The rules (administrative controls) are as follows:

1. The Global Farmer-Engineer should focus on “concepts”. The concepts are the main ideas of each week.
2. Post positive messages with minimal grammatical and spelling errors with your binary.
3. Use MLA format for your e-mails and your posts to your binary.
4. Remember the chain of command is from the General, Colonels, Majors, Captains, Lieutenants, Squad Leaders, and the Binary.
5. Remember, your online posts are accessible to everyone, be constructive.
6. Always refer to your binary with regards to decision making.
7. The Global Farmer-Engineers should consider the internet as the virtual classroom.
8. The Global Farmer-Engineers should be respectful and professional on the internet at all times.

**Learning Activities and Assessments**

A “weekly activities handout” will be available every Monday. It will contain the activities for the whole week. The activities are:

**A. Discussion Forum**

The Global Farmer Engineers should answer the questions in the Discussion Forum. The Discussion Forum consists of two parts. The first part will be your response to the main question(s). The second part will be your response to your binary.

**B.** **Connecting The Concepts**

There are five concepts that you have to use in sentences every week. Connecting The Concepts exercise is a critical thinking exercise I designed and I have been using Connecting The Concepts for 30 years now. I will explain this further on the first handout. Connecting The Concepts is related to your Binary Project Paper, which you have to produce before the end of this course.

**C. Binary Project Paper**

You have to research and write a paper on Photosynthesis before the end of this course. Updates will be given every week. The binary will use the five colors of the rainbow if a squad will be formed. The Binary Project Paper is due on the Week of 4/29.

Red = 2

Orange = 2

Yellow = 2

Green = 2

Blue = 2

Squad = 10 with a Squad Leader.

You can choose your own squad leader.

**D. Evolutionary Medicine** **A & B Video Exercises and Laboratory Exercises**

**Video exercises**

There are Two Movies or Videos you have to watch each week. The Evolutionary Medicine Videos are aligned with the objectives of this course. Watch movies or videos of your choice and the choice of your binary. The Evolutionary Medicine videos will provide you with the opportunity to apply the concepts to real world situations and problems. The binary should summarize each video in five sentences. These summaries should be e-mailed or posted to your binary. Read my posts.

**Laboratory Exercises**

The laboratory exercise is another application of Global Farmer-Engineer knowledge, in which Binaries create scientific report and provide evidence to back their conclusions. The Binaries have a variety of materials to help them, including the textbook, my Academic Lectures, and Open Educational Resources.

**E. “OPEN” Questions?**

Questions can be related to College Sciences Concepts. Questions can be pertaining to the COVID and other viruses. Questions can be on how to produce rice for all. Questions can be on the Grassy Farmlands Nuclear Bunkers Rice Complexes and Universities. Finally, questions can be on Mom’s Grassy “Extension”.

**The Rubric for Discussion Forum**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **2** | **1** | **0** |
| **Questions answered** | **Answered the question(s)** | **Responded to your binary or to your squad** | **No response** |

1. **Laboratory and Biology A&B Video Exercises**

I will explain these exercises further in the first handout.

**The Rubric for Laboratory Exercises (Laboratory Exercises that you will design will happen two weeks before the end of the course) A sample is given this week.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **0.5** | **0.5** | **0** |
| **Laboratory Report**  **Submitted** | **Report submitted** | **Correct conclusion** | **No report**  **submitted** |

**The Rubric for Evolutionary Medicine Video A&B Exercises**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria for Evolutionary Medicine Video A Exercise** | **0.5** | **0.1 each** | **0** |
| **Summary submitted** | **5 sentences** | **Less than 5 sentences** | **No summary submitted** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria for Evolutionary Medicine Video B Exercise** | **0.5** | **0.1 each** | **0** |
| **Summary submitted** | **5 sentences** | **Less than 5 sentences** | **No summary submitted** |

1. **CONNECTING THE CONCEPTS and the Binary Project Paper**

CONNECTING THE CONCEPTS exercise, as I have mentioned earlier, is a critical thinking exercise I designed for this course. I will explain this further on the first handout. CONNECTING THE CONCEPTS is related to your Binary Project Paper, which you have to produce before the end of the course. The Binary Project Paper is due on the Week of 4/29. Exchange with binary.

**The Rubric for CONNECTING THE CONCEPTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **10 points** | **2 points per concept** | **0** |
| **5 Concepts posted in sentences** | **5 Concepts** | **Less than 5 concepts** | **No response** |

**The Rubric for the BINARY PROJECT PAPER**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Points | 90-100 points | 80-89 points | 70-79 points | 0-69 |
| Accuracy of Concepts (50%) | Paper shows clear understanding and application of course concepts. Background information is accurate. [50 points] | Paper shows moderate understanding and application of course concepts. Background information contains minor omissions or inaccuracies. [44.5 points] | Paper shows little to no understanding or application of course concepts. Background information contains key omissions or inaccuracies. [39.5 points] | No paper submitted or inaccurate/non-credible information [34.5 points] |
| Relevance of Post (30%) | Paper directly addresses discussion topic; prompts further discussion of topic. [30 points] | Paper is related to discussion topic. [26.7 points] | Paper makes reference to discussion topic. No clear discussion is made. [23.7 points] | No paper or irrelevant information. [20.7 points] |
| Timeliness (10%) | Paper submitted before deadline [10 points] | Paper submitted after due date but before twenty-four hours after due date. [8.9 points] | Paper submitted one day late. [7.9 points] | No paper submitted. [0 points] |
| Clarity and Organization (10%) | Paper in proper MLA format (in-text citations and bibliography). [10 points] | Paper in proper MLA format with missing in-text citations. [8.9 points] | Paper with no in-text citations with bibliography. [7.9 points] | No paper submitted. [0 points] |

**More on the Binary Project Paper**

Each binary will present a project dealing with photosynthesis before the end of the course. Each binary will present an 8 page report. The 8 page report comprises one cover page (MLA formatted), one page full picture of Photosynthesis, and one page bibliography. The remaining 5 pages will be for Photosynthesis concepts and Evolutionary Medicine applications. The first page will be used for describing the process of Photosynthesis with Evolutionary Medicine correlation. The second page will be used for describing how plants evolved and converted Solar Energy. The third page will be used for describing how plants evolved in fixing carbon dioxide. The fourth page will be used for explaining the importance of the Calvin cycle with Evolutionary Medicine correlation. Finally, the fifth page will be used for explaining Photosynthesis and Food Production, specifically rice production for all.

**Teaching Procedures**

This is an asynchronous course. As stated in the Learning Activities and Assessments, I will be giving out handouts on Mondays. It will contain the activities for the whole week. The activities include discussions with your binary. The Global Farmer-Engineers will also need to respond to other binaries. These discussions will be ongoing throughout the week. Working with your binary or with other binaries follows the behaviorist approach of teaching similar to drill and practice done in military training.

Then, there is CONNECTING THE CONCEPTS exercise, which is a critical thinking exercise. As I mentioned earlier, I have personally devised the CONNECTING THE CONCEPTS exercise to teach the binaries how to apply their growing knowledge base to concepts all while utilizing multimedia. For the Farmer-Engineers, the concepts are the same. You can use the multimedia materials available online. This follows the cognitivist approach.

The Binary Project Paper is an assignment geared towards collaborative learning. The binary must create and submit an original eight-page report, which will be analyzed after submission, based upon accuracy of concepts presented, the relevance of the project, its timeliness, and its clarity and organization. This is a good learning experience for all. This activity follows the constructivist way of learning.

The laboratory exercise is another application of student knowledge, in which the binary will create a scientific report and provide evidence to back their conclusions. The binary will have two laboratory exercises before the end of this course. Feedback will be given accordingly before the end of this course.

There are also Evolutionary Medicine A&B video exercises that the binary must watch. The Evolutionary Medicine A&B exercise videos are aligned with the objectives as presented in the syllabus. The Evolutionary Medicine A&B videos are videos that provide relevant and applied approach that will allow the binary to relate Evolutionary Medicine to their daily lives. Also, the Evolutionary Medicine A&B videos will provide the binary to apply Evolutionary Medicine concepts for real world situations and problems. The binary should summarize each video in five sentences. These summaries should be discussed with the binary.

**Communication Policy**

When you contact me via e-mail, it is important that your communication be professional, appropriate, and military. Although we are online, it is best to follow the Grassy University of Santo Tomas policies.

**Course Topics**

The course will start with the Levels of Evolutionary Medicine Organization of organisms. Then, this will be followed by Life and The Origins of Life, Chemistry, Water, Hazards, Controls, Plant and Animal Cells, Cell Theory, Numbers11:5 Health Plan, Endosymbiosis, and Compartmentalization.

The proceeding chapters will deal with photosynthesis and related topics. These will be on the mitochondria, the Physics of ATP, the First and Second Laws of Thermodynamics, and Photosynthesis.

The course will end with Cellular Respiration. Also, additional Applied Laboratory Exercises are included. Furthermore, the course will end with “Open Questions” before the end of the course.

**Course Schedule**

**Week of 1/8 Levels of Evolutionary Medicine Organization**

**Week of 1/15 Life and the Origin of Life**

**Week of 1/22 Chemistry (Molecules)**

**Week of 1/29 Water and Evolutionary Medicine**

**Week of 2/5 Hazards: Physical, Chemical, Biological, Ergonomics**

**Week of 2/12 Controls: Engineering Control, Administrative Control, Use of PPE**

**Week of 2/19 Plant and Animal Cells**

**Week of 2/26 Cell Theory**

**Week of 3/4 Numbers11:5 Health Plan**

**Week of 3/11 Endosymbiotic Theory and Altruism**

**Week of 3/18 Compartmentalization and Engineering Control**

**Week of 3/25 Mitochondria and Chloroplasts**

**Week of 4/1 Physics of ATP; Potential and Kinetic Energy**

**Week of 4/8 First and Second Laws of Thermodynamics**

**Week of 4/15 Photosynthesis**

**Week of 4/22 ATP as Energy Carrier**

**Week of 4/29 Binary Project Paper due**

**Week of 5/6 Laboratory Exercise and Photosynthesis**

**Week of 5/13 Laboratory Exercise and Rice Production**

**Week of 5/20 “Open Questions” End of Course**