

MS4665 – Sustainable Development in Water, Agriculture and Aquaculture

Course Code	MS4665					
Course Title	Sustainable Development in Water, Agriculture and Aquaculture					
Pre-requisites	NIL					
Pre-requisite for	NIL					
No of AUs	2					
Contact Hours	26					
Course Aims						
<p>In this prescribed elective, students will be introduced to critical industrial sectors, namely water, agriculture and aquaculture, where sustainable development concepts that integrate these three sectors will be discussed. The students will learn key concepts on water, agriculture and aquaculture, and how materials science and engineering can be applied to manage and advance these sectors in a sustainable manner. The course will integrate knowledge learnt with practical applications through a team project that allows these students to analyze and propose solutions that facilitate sustainable development in these three sectors. Student teams will be encouraged to collaborate with industry in scoping the project, analyze and propose solutions that address the specific problem encountered by the industry.</p>						
Intended Learning Outcomes (ILO)						
<p>By the end of this course, you (as a student) would be able to:</p> <ol style="list-style-type: none"> 1. Acquire knowledge relating to water, agriculture and aquaculture, and understand the inter-relationship between these three sectors 2. Understand the principles relating to the sustainable development in water, agriculture and aquaculture 3. Critically assess problems relating to the sustainable development in water, agriculture and aquaculture 4. Apply knowledge and critical thinking to develop solutions that promote the sustainable development in these three sectors. 5. Demonstrate their capacity to work in teams, and to network and collaborate with practitioners of these industrial sectors. 6. Deliver clear and compelling oral presentation of their analyses and results, and defend their proposed solutions. 						
Course Content						
<ol style="list-style-type: none"> 1. Introduction to water, agriculture and aquaculture 2. Sustainability concepts and their relationship to water, agriculture, and 						

aquaculture

3. Sustainable development in water: water conservation, purification and recycling. Application and use of sustainable materials on water treatment systems
4. Sustainable development in agriculture: nutrients delivery and management, pesticide delivery and applications, water management and control, nutrients and pesticide leaching and management of pollution of water bodies
5. Sustainable development in aquaculture: water and nutrient management, sustainable antimicrobial system to manage infection and health of marine animals
6. Relationship between water, agriculture and aquaculture- application of sustainable concepts in the three sectors.

Reading and References

1. Charlesworth, Susanne; Booth, Colin; Adeyeye, Kemi, editors., Sustainable Water Engineering, Elsevier, Netherlands, 2021 (ISBN: 978-0-12-816120-3)
2. Brassley, Paul; Soffe, Richard, Agriculture: A Very Short Introduction, Oxford University Press, 2016 (ISBN-13: 978-0-19-872596-1)
3. Mohammed, Stephanie, Tomorrow's Agriculture "NFT Hydroponics"-Grow within Your Budget, Springer, 2018 (ISBN13: 978-0-86-417527-4)
4. Hai, Faisal I.; Visvanathan, Chettiyappan; Boopathy, Ramaraj, Sustainable Aquaculture, Springer International Publishing, 2018 (ISBN: 978-3-31-973257-2)

Course Policies and Student Responsibilities

Absentee in continuous assessment must be supported by a medical certificate submitted through the University online system.

Attendance is taken for every tutorial classes for information on student's participation of class discussion.

Academic Integrity

Good academic work depends on honesty and ethical behavior. Quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honor Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student of NTU, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at the University. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, and collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.