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| <b>Semester</b>   | 7 and 8   |                         |                      |
| <b>Course Code:</b>   | MIBI 41824  |                         |                      |
| <b>Course Name:</b>   | Microbiology of Fish Diseases, Advanced Bacterial Biochemistry and Physiology |                         |                      |
| <b>Credit Value:</b>  | 4   |                         |                      |
| <b>Core/Optional</b>  | Core  |                         |                      |
| <b>Hourly Breakdown</b>   | Theory  | Practical               | Independent Learning |
|   | 60 hrs  | -                       | 140 hrs              |
| <b>Course Aim/Intended Learning Outcomes:</b>   |   |                         |                      |
| Upon successful completion of this course student will be able to;  |   |                         |                      |
| <ul style="list-style-type: none"> <li>• Discuss the principles of aquatic animal health management,</li> <li>• Describe the aetiology, clinical manifestations and laboratory diagnostic methods of common bacterial, viral and fungal diseases affecting tropical freshwater ornamental fish, food fish and fish,</li> <li>• Discuss the methods available to control and prevent microbial diseases of fish and shrimp,</li> <li>• Discuss the consequences of indiscriminate use of antibiotics and other pharmaceuticals in aquaculture,</li> <li>• Explain the mechanisms of microbial spoilage of fish,</li> <li>• Understand mechanisms of specific bacterial biochemical processes and</li> <li>• Identify the potential of these specific bacterial biochemical processes in various applications.</li> </ul> |   |                         |                      |
| <b>Course Content:</b>  |   |                         |                      |
| <b>Microbiology of Fish Diseases:</b>   |   |                         |                      |
| Introduction to ornamental fish, food fish and shrimp farming in Sri Lanka - Economically important species and the basics of management practices, <i>Aquatic animal health management</i> : Bacterial diseases of fish and shrimp, Viral diseases of fish and shrimp, Fungal diseases of fish, Control and prevention of microbial infections of fish and shrimp. <i>Use of antibiotics and other pharmaceuticals in aquatic animals</i> : Antimicrobial resistance in aquaculture. Microbial spoilage of fish and shellfish.   |   |                         |                      |
| <b>Advanced Bacterial Biochemistry and Physiology:</b>  |   |                         |                      |
| Bacterial nitrogen fixation. Biochemistry of methylotrophy and methanogenesis. Anaerobic ammonium oxidation (Anammox reaction) – mechanism, types of anammox bacteria, functional significance of anammoxosome and riboplasm. <i>Bacterial Quorum Sensing</i> : Overview and mechanism, Acyl-homoserine lactone (AHLs) in QS systems, Types of quorum sensing, Bacterial cooperate behaviors that rely on QS, QS in bacterial virulence, biofilm formation and in competition. How organisms operate a system of maintaining H balance by taking H from the environment, incorporating the required amount in cellular material and sending the excess out.   |   |                         |                      |
| <b>Teaching /Learning Methods:</b>  |   |                         |                      |
| A combination of lectures and assignments   |   |                         |                      |
| <b>Assessment Strategy:</b>   |   |                         |                      |
| End of the course unit examination  |   |                         |                      |
| <b>Continuous Assessment</b>  |   | <b>Final Assessment</b> |                      |
| 0%  |   | 100%                    |                      |
| Details:  | Theory (%)  | Practical (%)           | Other (%)            |
| N/A   | 100   | -                       | -                    |
| <b>Recommended Reading:</b>   |   |                         |                      |
| <ul style="list-style-type: none"> <li>• Noga, E.J. (2010). <i>Fish diseases: Diagnosis and Treatment</i>. 2<sup>nd</sup> Ed. Wiley-Blackwell.</li> <li>• Roberts, H.E. (2009). <i>Fundamentals of Ornamental Fish Health</i>. 1<sup>st</sup> Ed. Wiley-Blackwell.</li> <li>• Related current review and research articles in peer-reviewed journals as recommended by the lecturers.</li> </ul>  |   |                         |                      |