<table>
<tr><td>Course Code</td><td colspan="6">BYU 5300</td></tr>
<tr><td>Level</td><td colspan="6">05</td></tr>
<tr><td>Course Title</td><td colspan="6">Environmental & Applied Microbiology</td></tr>
<tr><td>Credit value</td><td colspan="6">3</td></tr>
<tr><td>Core/Optional</td><td colspan="6">Optional</td></tr>
<tr><td>Prerequisites</td><td colspan="6">BYU 4303 Pass/Valid OCAM, BOU2103 EL/Pass</td></tr>
<tr><td rowspan="2">Hourly breakdown</td><td colspan="2">Theory</td><td>Practical</td><td>Independent Learning</td><td>Assessment</td><td>Total</td></tr>
<tr><td>(22 Sessions)
44 hrs</td><td>(4 DSs)
08 hrs</td><td>(4 days Lab – 6x4 = 24 + 2 hrs 5th day lab
26 hrs</td><td>(Sessions -66hrs) ie 3 x 22 sessions
+ Online /Audio-visual materials and other learning resources = 3hrs
+ Lab/field/ other (x 0.5)
24 X 0.5 = 12hrs
Other (recommended reading) 3hrs
84 hrs</td><td>(1 OBT x 1h) + (1 NBT x 1h) + (1PT x 1h)
3hrs</td><td>165hrs</td></tr>
<tr><td>Course Aim/s.</td><td colspan="6">1. To introduce the students the diversity of microbial life in different microbial habitats.
2. To provide students an understanding of the impacts of microorganisms in environment related issues, public health, food/water sanitation, industry and genetic engineering.
3. To introduce students various methods used to detect, quantify and monitor microbial presence and activity in different environments through laboratory exercises.</td></tr>
<tr><td>PLOs addressed by course</td><td colspan="6">PLO1: Knowledge: Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree.
PLO2: Practical Knowledge and Application. Demonstrate the competency to use the knowledge and practical skills appropriately.
PLO4: Individual Work, Team Work and Leadership: Demonstrate the competency in working independently and in groups in addressing issues in multi-disciplinary environments and completing the tasks on time through collaborative learning while exhibiting leadership.
PLO8: Vision for Life: Develop the capacity to project for future through identifying self-directed goals and continuously targeting towards them for self-improvement by undertaking further studies.
PLO9: Lifelong Learning: Develop the capacity to foresee new trends and their impacts and continuously update knowledge and develop skills willingly to meet those future challenges.</td></tr>
<tr><td>Course Learning Outcomes (CLO)</td><td colspan="6">The students should be able to:

CLO1: Investigate properties of different environments such as soil, air, water and food and how these properties affect the distribution and survival of microorganisms – PLO1, PLO2
CLO2: Evaluate the importance of microorganisms in biogeochemical cycles, microbial deterioration, food spoilage, industry and genetic engineering applications. PLO1 , PLO2 and PLO9
CLO3: List the factors affecting the water pollution, indicators used to determine water quality and analyze the treatment processes of municipal water, wastewater and hazardous waste. PLO1, PLO2 and PLO9
CLO4: Demonstrate the ability to identify reservoirs of infection and modes of transmission of human diseases, components of human immunity system and types of immunity.PLO1, PLO8 and PLO9
CLO5: Demonstrate the ability to apply theoretical learning on acquiring practical knowledge and techniques - (water quality tests, microbiological tests on milk and milk products, microbial enumeration tests etc.) PLO2, PLO4, PLO8 and PLO9</td></tr>
<tr><td>Content
(Main topics, sub topics)</td><td colspan="6">Microbiology of soil –Microbiology of soil , Interactions between organisms in the soil , Role of microorganisms in decomposition and its ecological importance, Microbial deterioration of specific material
Microbiology of air and water – Aeromicrobiology, Aquatic microorganisms, Pollution of water supplies and quality and treatment of potable water, wastewater and waste management
Microbiology of food – Microorganisms in food, Microbial spoilage food, Food borne illnesses, Principles and processes of food preservation, Microbiological standards and quality control of food
Microorganisms and diseases of man – Microorganisms of medical importance, Relationships between microorganisms and man, Infectious diseases, Host's resistance to microbial infection, Immune system and immunological tests.
Exploitation of microorganisms by man - Industrial uses of microorganisms- food and alcoholic beverages, Industrial uses of microorganisms- organic compounds and pharmaceutical products, Microorganisms and genetic engineering</td></tr>
<tr><td>Teaching Learning methods (TL)</td><td colspan="6">Self-Learning/Independent learning of Self-study
▪ Online Activities (OL)
▪ Reference Work (RE)</td></tr>
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<tr><td></td><td colspan="2">Compulsory contact sessions
▪ Practical Sessions (PR)
▪ Assessments (AS) and Feedback – MCQs (MCQ);Structured Essay (SEQ); Essay Questions (ES); Reports (RE); Practical Tests (PT); Assignments (A)

Non-compulsory contact sessions
▪ Day Schools (DS)</td></tr>
<tr><td rowspan="2">Assessment strategy</td><td>Overall CA Mark (OCAM): 40%</td><td>Final Assessment: 60%</td></tr>
<tr><td>OCAM :
50% best of OBT/NBT (1h) + 20 % next best OBT/NBT(1h) + 30% from PT (1h)(Minimum 30 % and attendance compulsory)</td><td>Final Evaluation
Theory: 100%
1 paper (Essay type) – 2hrs</td></tr>
<tr><td>Recommended Readings:</td><td colspan="2">• Dubay, R.C. (2005) . A Textbook of Microbiology. S Chand & Company Ltd, New Delhi.
• Eley, A.R. (Ed) (1992) Microbial Food Poisoning. Chapman & Hall, London.
• Parry, T.J. & Pawsey, R.K.(1984). Principles of Microbiology for Students of Food Technology. Stanley Tomes Publishers Ltd.</td></tr>
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