**Module Handbook**

<table>
<tr><td>Module Name</td><td colspan="6">Microbiology Analysis</td></tr>
<tr><td>Module Level</td><td colspan="6">Higher Diploma</td></tr>
<tr><td>Code, if applicable</td><td colspan="6">VKD430</td></tr>
<tr><td>Subtitle, if applicable</td><td colspan="6">-</td></tr>
<tr><td>Courses, if applicable</td><td colspan="6">-</td></tr>
<tr><td>Semester(s) in which the module is taught</td><td colspan="6">4th semester</td></tr>
<tr><td>A person responsible for the module</td><td colspan="6">Puji Kurniawati, M.Sc.</td></tr>
<tr><td>Lecturer</td><td colspan="6">Puji Kurniawati, M.Sc.</td></tr>
<tr><td>Language</td><td colspan="6">Bahasa Indonesia</td></tr>
<tr><td>Relation to curriculum</td><td colspan="6">compulsory</td></tr>
<tr><td>Type of teaching, contact hours</td><td colspan="6">Lectures: 100 min/week<br>Structured Assignments/structured activities: 120 min/week<br>Online Activity/individual study: 120 min/week<br>Laboratory work: 340 min/week</td></tr>
<tr><td rowspan="3">Workload</td><td>Total Workload</td><td colspan="5">91 hours; 2 CU</td></tr>
<tr><td></td><td>Face to face teaching</td><td>Structured activities</td><td>Independent study</td><td>Data Analysis</td><td>Exam</td></tr>
<tr><td>Hours</td><td>12</td><td>14</td><td>14</td><td>40</td><td>11</td></tr>
<tr><td>Credit Points</td><td colspan="6">2 SCU/3,4 ECTS</td></tr>
<tr><td>Requirements according to the examination regulations</td><td colspan="6">75% minimum requirements of attendance in theory<br>100% requirements of attendance in lab activities</td></tr>
<tr><td>Recommended prerequisites</td><td colspan="6">Organic chemistry</td></tr>
<tr><td>Module objectives/intended learning outcomes</td><td colspan="6">PLO 3: Students can express basic concepts of chemistry, chemical analysis, operation, and maintenance of chemical instruments that can be applied in their work<br>PLO 7: Students can select and carry out chemical analysis methods and operate instruments by applying the principles of chemical occupational health and safety<br>Subject LO:<br>a. Able to classify microorganisms based on their morphology, reproduction, and physiology<br>b. Able to explain and apply microbiology laboratory techniques<br>c. Able to explain and analyze staining and microscopy analysis techniques<br>d. Able to analyze enumeration techniques<br>e. Able to apply laboratory procedures and perform aseptic techniques<br>f. Able to apply laboratory procedures and perform microbiological qualitative and quantitative analysis techniques<br>g. Able to apply principles and build a culture of occupational safety and health</td></tr>
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| | h. Able to analyze data and report test results in writing and orally (mandatory in practicum)<br>i. Able to build teamwork in carrying out laboratory procedures |
| **Content** | a. Microbial classification: morphology, reproduction, physiology<br>b. Microbiology laboratory techniques<br>c. Microscopy technique<br>d. Enumeration<br>e. Qualitative and Quantitative Analysis |
| **Study and examination requirements and forms of examination** | Table Value Graduation<br>A 80<br>A- 77.5<br>A/B 75<br>B+ 72.5<br>B 70<br>B- 67.5<br>B/C 65<br>C+ 62.5<br>C 60<br>C- 55<br>C/D 50<br>D+ 45<br>D 40<br>E 0 |
| **Media employed** | Google classroom, youtube, zoom meeting, google form, google doc, standard method, laboratory handbook |
| **Reading list** | 1. Budiyanto, M.A.K., 2002, Mikrobiologi Terapan, Universitas Muhammadiyah Malang<br>2. Gandjar, I., Sjamsuridjal, W., 2006, Mikologi: Dasar dan Terapan, Yayasan obor Indonesia, Jakarta<br>3. Madigan, MT., 1991. Biology of Microorganisms. Sixth ed. Prentice-Hall International, Inc<br>4. Talaro, K.P., 2008, Foundation in Microbiology: basic principles, 6th Ed., Mc. Graw Hill<br>5. Pelczar, M.J., Chan, E.C.S., 1986, Dasar-dasar Mikrobiologi, Jilid 1., Penerbit UI-Press, Jakarta<br>6. Pelczar, M.J., Chan, E.C.S., 1988, Dasar-dasar Mikrobiologi, Jilid 2., Penerbit UI-Press, Jakarta<br>7. Willey, J.M., Sherwood, L.M., Woulverto, C.J., 2008, Microbiology, 7th Ed., McGraw Hill<br>8. Benson, 2001, Microbiology Applications, 8th Ed, McGraw Hill<br>9. Goldman, E., Green, L.H., 2009, Practical Handbook of Microbiology, 2nd Ed, CRC Press, Boca Raton. |