

MODULE HANDBOOK

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| Module Name | Natural Product Chemistry |
| Module level | Bachelor |
| Abbreviation, if applicable | 3074112069 |
| Sub-heading, if applicable | - |
| Course included in the module, if applicable | - |
| Semester/term | 5 th / Third Year |
| Module coordinator(s) | Prof. Dr. Tukiran, M.Si. |
| Lecturer(s) | Prof. Dr. Tukiran, M.Si., Prof. Dr. Suyatno, M.Si., Dr. Ratih Dewi Saputri, M.Si |
| Language | Indonesian |
| Classification within the curriculum | Elective Course |
| Teaching format/class hours per week during the semester | 2 hours lecturers (50 min per hours) |
| Workload | 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79.33 total hours per semester ~ 3.18 ECTS** |
| Credit points | 2 CU x 1.59 = 3.18 ECTS |
| Prerequisite course(s) | - |
| Targeted learning outcomes | <p>CLO 1 Students can use the concept of secondary metabolite compounds to screen, isolate, and test the bioactivity of secondary metabolites</p> <p>CLO 2 Students can describe the basic principles of formation reactions and biosynthetic pathways for secondary metabolites.</p> <p>CLO 3 Students can master the basic concepts of secondary metabolites and their benefits for humans.</p> <p>CLO 4 Students can make decisions based on the results of screening, isolation, and bioactivity tests of secondary metabolites.</p> <p>CLO 5 Students Have a responsible attitude in developing extracts or isolates as herbal medicinal ingredients.</p> |
| Content | <ol style="list-style-type: none"> 1. Classification and benefits of secondary metabolite compounds. 2. Explanation of various types of extracts that traditional and modern industries can utilize. 3. Indonesian medicinal plant bioactive compounds and their uses. 4. Data collection of plant bioactive compounds 5. Can use the explain of traditional medicine of traditional medicine. 6. Terpenoids, classification, biosynthesis, and distribution in plants. |

| | <ol style="list-style-type: none"> 7. Steroids, classification, biosynthesis, and distribution in plants. 8. Phenylpropanoids, classification, biosynthesis, and distribution in plants. 9. Polyketides, classification, biosynthesis, and distribution in plants. 10. Flavonoids, classification, biosynthesis, and distribution in plants. 11. Alkaloids, classification, biosynthesis, and distribution in plants. 12. Isolation methods/techniques. 13. Identify isolated compounds through chemical tests. 14. Explain the results of the study of the journal of natural materials chemistry. 15. Present work visits in groups from traditional medicine (herbal) industry, natural ingredients industry, and pharmaceutical industry. | | | | | | | | | | |
|-------------------------|--|-----------------------|----------------------------|---------------|-----|------------|-----|-------------------|-----|---------------------|-----|
| Study/exam achievements | <p>Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:</p> <table border="1"> <thead> <tr> <th>Assessment Components</th> <th>Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td>20%</td> </tr> <tr> <td>Assignment</td> <td>30%</td> </tr> <tr> <td>Mid-semester test</td> <td>20%</td> </tr> <tr> <td>Final semester test</td> <td>30%</td> </tr> </tbody> </table> | Assessment Components | Percentage of contribution | Participation | 20% | Assignment | 30% | Mid-semester test | 20% | Final semester test | 30% |
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| Participation | 20% | | | | | | | | | | |
| Assignment | 30% | | | | | | | | | | |
| Mid-semester test | 20% | | | | | | | | | | |
| Final semester test | 30% | | | | | | | | | | |
| Media | Computer, LCD, White board, presentation, and book | | | | | | | | | | |
| Learning Methods | Individual assignment, group assignment, discussion, Presentation. | | | | | | | | | | |
| Literature | <ol style="list-style-type: none"> 1. Achmad, S.A., Hakim, E.H., Makmur, L., Syah, Y.M, Juliawati, L.D., dan Mujahidin, D., 2007, Tumbuhan-tumbuhan Obat Indonesia, ITB Press, Bandung. 2. Andersen, O.M., and Markham, O.M., 2006, Flavonoid: Chemistry, Biochemistry and Applications , CRC Press, Taylor and Francis Group. 3. Cordell, G.A., 2002., The Alkaloid: Chemistry and Pharmacology, Academic Press Inc. 4. Dewick, P.M., 2009. Medicinal Natural Product: A Biosynthetic Approach, 3rd Ed., John Willey & Sons, Inggris. 5. Harborne, J.B. 1987. <i>Metode Fitokimia</i>. Penerjemah: Kosasih P. Bandung : Penerbit ITB. 6. Tukiran. 2015. Kimia Bahan Alam: Berbasis Field Study dan Pendekatan Chemo-Enterpreunership, Surabaya: Penerbit Unesa University Press. 7. Vermerris, W., and Nicholson, R., 2006, Phenolic Compound Biochemistry, Springer. 8. Journal related to Natural Product Chemistry. | | | | | | | | | | |
| Notes: | *1 CU in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) | | | | | | | | | | |

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| | individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018. |
| | **1 CU = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/UN38/Hk/Ak/2019 |

