

## **Module Descriptions**

|   | Fundamentals of analytical chamistry (KING 410)   |  |  |
|---|---|--|--|
| Module designation  | Fundamentals of analytical chemistry (KIM6410)  |  |  |
| Semester(s) in which the module is taught                     | 2   |  |  |
| Person responsible for the module                             | Dra. Regina Tutik Padmaningrum, MSi   |  |  |
| Language  | Indonesia   |  |  |
| Relation to curriculum  | Compulsory <del>/ elective / specialisation</del>   |  |  |
| Teaching methods  | Lecture, discussion, project  |  |  |
| Workload (incl. contact hours, self-study hours)              | (Estimated) Total workload:  100 minutes/week for class learning  50 minutes/week for project  100 minutes/week for labwork   |  |  |
| Credit points   | 3 sks   |  |  |
| Required and recommended prerequisites for joining the module | General Chemistry   |  |  |
| Module<br>objectives/intended<br>learning outcomes            | <ol> <li>Explain the concept of qualitative and quantitative sample identification using volumetric methods responsibly, with quality, and in a measurable manner.</li> <li>Explains the concepts of qualitative and quantitative analysis, including gravimetry, acid-base titration, complex formation titration, oxidation-reduction titration, and precipitation titration</li> <li>Process and interpret qualitative and quantitative analysis data, including gravimetry, acid-base titration, complex formation titration, oxidation-reduction titration, and precipitation titration</li> <li>Design procedures for applying qualitative and quantitative analysis methods, including gravimetry, acid-base titration, complex formation titration, oxidation-reduction titration, and precipitation titration</li> <li>perform general and specific laboratory work, as well as synthesis and measurement techniques.</li> </ol> |  |  |
| Content   | - Preparation of sampel - qualitative analysis methods: identification of anions and cations - quantitative analysis methods, including gravimetry, acid-base titration, complex formation titration, oxidation-reduction titration, and precipitation titration  |  |  |
| Examination forms   | Essay, project report, labwork repot, written tests   |  |  |



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|-----------------------|--|------------|-------------------------|---|--|
| Study and examination | ination Minimum attendance at lectures is 75%  |            |                         |   |  |
| requirements          | Final score (NA) is calculated as follows:   |            |                         |   |  |
|                       | Learning Outcome   | Weight (%) | Technique of Assesment  | 1 |  |
|                       | 5  | 5          | Participation           |   |  |
|                       | 3, 4   | 10         | Pretest                 |   |  |
|                       | 3,4  | 10         | Postest                 |   |  |
|                       | 3, 4   | 40         | Labwork report          |   |  |
|                       | 1,2  | 5          | Project report          |   |  |
|                       | 1,2  | 15         | Mid-term Written Test   | ] |  |
|                       | 1,2  | 15         | Final Exam Written Test |   |  |
|                       |  |            |                         |   |  |
| Reading list          | Larry G. Hargis. 1988. Analytical Chemistry Principle and     Techniques. London: Practice Hall International Edition.   |            |                         |   |  |
|                       | 2. I Made Sukarna (2007). Diktat Kimia Analisis 1. Analisis Kualitatif.<br>Jurusan Pendidikan Kimia FMIPA UNY  |            |                         |   |  |
|                       | 3. Sorum C.H. 1977. Introduction to Semimicro Qualitative Analysis. Fifth Edition. USA: Prentice Hall, INC   |            |                         |   |  |
|                       | 4. Bassett, at all. (Revisers). 1978. Vogel's Text Book of Quantitative Inorganic Analysis. Including Elementary Instrumental Analysis. Fourth Ed. London and New York: Longman. |            |                         |   |  |
|                       | 5. Daniel C. Harris. 1987. Quantitative Chemical Analysis. New York: Freeman & Co.   |            |                         |   |  |
|                       | 6. Day, R.A, Underwood, A.L. 1989. Analisis Kimia Kuantitatif. Edisi 5.<br>Jakarta : Erlangga  |            |                         |   |  |
|                       | 7. Garry D. Christian. 1977. Analytical Chemistry. New York: John Willey & Sons  |            |                         |   |  |
|                       | 8. Khopkar. S.M. 1990. Konsep Dasar Kimia Analitik. Cetakan I. Jakarta : UI Press  |            |                         |   |  |

| Prepared by                         | Verified by: | Authorized by:             |  |
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| Dra. Regina Tutik Padmaningrum, MSi |              | Dr. Retno Arianingrum, MSi |  |