

**Table 3.3** Courses List of Chemistry Education Program and Module Description

Sem	Course Code	Courses' Name	CSU	ECTS	Status	Module Description
<b>I</b>	16A33C101	Basic Mathematic	3	4.5	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C102	Basic Physic	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C103	Basic Chemistry	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C104	Basic Biology	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for

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						16 weeks. 3 CSU (4.53 ECTS)
	16A33C105	Basic Statistic	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C106	Environmental Education	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C107	Pancasila	2	3	Compulsory	The total workload is 45.33 hours per semester ~ 3.02 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. (1 ECTS = 30 working hours) 2 CSU (3.02 ECTS)
	16A33C108	English for Chemistry	2	3	Compulsory	The total workload is 45.33 hours per semester ~ 3.02 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. (1 ECTS = 30 working hours)

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						2 CSU (3.02 ECTS)
		<b>Total: C=20, E=0</b>	<b>20</b>	<b>30</b>		
<b>II</b>	16A33C201	Islam Study	2	3	Compulsory	The total workload is 45.33 hours per semester ~ 3.02 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. (1 ECTS = 30 working hours) 2 CSU (3.02 ECTS)
		Protestant Study			Compulsory	
		Catholic Study			Compulsory	
		Hindu Study			Compulsory	
		Buddha Study			Compulsory	
16A33C202	Civic Education	2	3	Compulsory	The total workload is 45.33 hours per semester ~ 3.02 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. (1 ECTS = 30 working hours) 2 CSU (3.02 ECTS)	
16A33C203	Indonesian	2	3	Compulsory	The total workload is 45.33 hours per semester ~ 3.02 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. (1 ECTS = 30 working hours) 2 CSU (3.02 ECTS)	
16A33C204	Advance of Basic Chemistry	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities,	

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						180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C205	Chemistry Laboratory Management	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C206	Organic Chemistry I	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C207	Experiment of Organic Chemistry I	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of laboratory activities, 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C208	Mathematical Chemistry	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks.

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						2 CSU (3.02 ECTS)
	16A33C209	Inorganic Chemistry I	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
		<b>Total: C=20, E=0</b>	<b>20</b>	<b>30</b>		
<b>III</b>	16A33C301	Analytical chemistry I	3	4.5	Compulsory	3 x 50 minutes lectures, 3 x 60 minutes of individual activities, 3 x 60 minutes structured activities, 16 weeks per semester, 130 – 136 total hours per semester ~4,5 ECTS** **3 CSU (4.5 ECTS)
	16A33C302	Experimental of Analytical Chemistry I	1	1.5	Compulsory	The total workload is 45.33 hours per semester ~ 1.501 ECTS consisting of 50 minutes of laboratory activities, 60 minutes of individual activities, and 60 minutes of structured activities per week for 16 weeks. 1 CSU (1.501 ECTS)
	16A33C303	Physical Chemistry I	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C304	Philosophy of Science	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120

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						minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C305	Inorganic Chemistry II	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C306	Organic Chemistry II	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C307	Experiment of Organic Chemistry II	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of laboratory activities, 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C308	Basic Science Education	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)

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	16A33C309	Chemistry Library	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C310	Introduction of Education	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
		<b>Total: C=20 E=0</b>	<b>22</b>	<b>33</b>		
<b>IV</b>	16A33C401	Analytical Chemistry II	3	4.5	Compulsory	of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks
	16A33C402	Experiment of Analytical Chemistry II	1	1.5	Compulsory	The total workload is 45.22 hours per semester ~ 1.51 ECTS consisting of 50 minutes of laboratory activities, 60 minutes of individual activities, and 60 minutes of structured activities per week for 16 weeks. 1 CSU (1.51 ECTS)
	16A33C403	Physical Chemistry II	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of

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						lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C404	Experiment of Inorganic Chemistry	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of laboratory activities, 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C405	Physical Inorganic Chemistry	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C406	Organic Chemistry III	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C407	Experiment of Physical Chemistry I	1	1.5	Compulsory	The total workload is 45.22 hours per semester ~ 1.51 ECTS consisting of 50 minutes of laboratory activities, 60 minutes of individual activities, and 60 minutes of structured activities per week for 16 weeks. 1 CSU (1.51 ECTS)
	16A33C408	Biochemistry	3	4.5	Compulsory	The total workload is 136 hours



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						per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C409	Teaching Profession	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C410	Student Psychology Development	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C411	Chemical Bonding	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
		<b>Total: C=23, E=0</b>	<b>23</b>	<b>34.5</b>		
	16A33C501	Instrument of Analytical	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of

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V		Chemistry				lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C502	Experiment of Instrumental Analytical Chemistry	1	1.5	Compulsory	The total workload is 45.33 hours per semester ~ 1.51 ECTS consisting of 50 minutes of laboratory activities, 60 minutes of individual activities, and 60 minutes of structured activities per week for 16 weeks. 1 CSU (1.51 ECTS)
	16A33C503	Experiment of Biochemistry	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of laboratory activities, 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C504	Experiment of Physical Chemistry II	1	1.5	Compulsory	The total workload is 45.33 hours per semester ~ 1.51 ECTS consisting of 50 minutes of laboratory activities, 60 minutes of individual activities, and 60 minutes of structured activities per week for 16 weeks. 1 CSU (1.51 ECTS)
	16A33C505	Nuclear and Radiochemistry	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C506	Food	3	4.5	Compulsory	The total workload is 136 hours

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		Chemistry				per semester ~ 4.53 ECTS consisting of 100 minutes of lectures (face to face), 50 minutes of Laboratory activities, 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C507	Learning and Teaching	3	4.5	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C508	Chemistry Teaching and Learning Strategy	3	4.5	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C509	Chemistry Instruction Planning	3	4.5	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C510	Assessment of Chemistry Instruction	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured

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						activities per week for 16 weeks. 3 CSU (4.53 ECTS)
		<b>Total: C=22, E=4</b>	<b>23</b>	<b>34.5</b>		
VI	16A33C601	Environmental Chemistry	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C602	Chemistry Curriculum Review	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C603	Research Method of Chemistry Education	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)
	16A33C604	Microteaching *)	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (Class Meeting), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C605	Seminar of	2	3	Compulsory	2 x 50 minutes' lectures, 2 x 60

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		Chemistry Education *)				minutes' structured activity, 2 x 60 minutes' individual activity, 16 weeks per semester, 90.7 total working hours per semester ~ 3.02 ECTS  2 CSU (3.02 ECTS)
	16A33C606	Entrepreneurship	2	3	Compulsory	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C607	Statistic of Education	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C608	Introduction of Biotechnology	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C609	Industrial Chemistry	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)

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	16A33C610	Chemistry Learning Simulation	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C611	Industrial Microbiology	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C612	Chemistry Curriculum Vocational Studies	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
		<b>Total: C=14, E=12</b>	<b>26</b>	<b>39</b>		
<b>VII</b>	16A33C701	Teaching Experience *)	4	6	Compulsory	
	16A31C702	Community Experience *)	3	4.5	Compulsory	The total workload is 136 hours per semester ~ 4.53 ECTS consisting of 150 minutes of lectures (face to face), 180 minutes of individual activities, and 180 minutes of structured activities per week for 16 weeks. 3 CSU (4.53 ECTS)

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	16A33C511	IT-based Learning Media	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C512	Pharmaceutical Chemistry	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C703	Natural Organic Chemistry	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C704	Waste Management	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
	16A33C705	Polymer Chemistry	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks.

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						2 CSU (3.02 ECTS)
	16A33C706	Computational Chemistry	2	3	Elective	The total workload is 90.66 hours per semester ~ 3.02 ECTS consisting of 100 minutes of lectures (face to face), 120 minutes of individual activities, and 120 minutes of structured activities per week for 16 weeks. 2 CSU (3.02 ECTS)
		<b>Total: C=7, E=12</b>	<b>19</b>	<b>28.5</b>		
<b>VIII</b>	16A31C801	Thesis *)	6	9	Compulsory	The total workload is 271.98 hours per semester ~ 9.06 ECTS consisting of 300 minutes of lectures (face to face), 360 minutes of individual activities, and 360 minutes of structured activities per week for 16 weeks. 6 CSU (9.06 ECTS)
		<b>Total: C=6, E=0</b>	<b>6</b>	<b>9</b>		

\*) The Courses carried out in odd and even semesters

**Compulsory Subject (C) are 135 CSU equal to 202.5 ECTS**

**The Elective Subject (E) are available for 24 CSU equal to 36 ECTS**

**The minimum number of credits for completion the program is 144 CSU (216 ECTS)**

**The minimum amount of credit for elective courses are 9 CSU = 13.5 ECTS**