

**RENCANA PROGRAM DAN
KEGIATAN PEMBELAJARAN SEMESTER
(RPKPS)**



Hidrologi dan Konservasi Air
Semester 3/2 SKS/KUI-7301
Program Studi S2 Ilmu Kesehatan Masyarakat

Oleh:

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Dr. M. Widyastuti, MT.

**Universitas Gadjah Mada
Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan
2019**



Universitas Gadjah Mada

Fakultas Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan
Departemen/Program Studi S2 Ilmu Kesehatan Masyarakat

RENCANA PROGRAM DAN KEGIATAN PEMBELAJARAN SEMESTER (RPKPS)

Kode Mata Kuliah	Nama Mata Kuliah	Bobot (sks)	Semester	Status Mata Kuliah	Mata Kuliah Prasyarat																									
KUI-7301	Hydrology and Water Conservation	2	3	Core	-																									
Capaian Pembelajaran Lulusan (CPL) yang dibebankan pada MK	ELO 1. Able to practice universal morality and values, reflected in the ideology of Pancasila ELO 2. Able to analyze public health programs from 5 core public health principles ELO 3. Able to conduct public health research ELO 4. Able to create public health programs and health service deliveries																													
Capaian Pembelajaran Mata Kuliah (CPMK)	CPMK1	Describe the principles of hydrology, water conservation and the effects of water pollution toward environmental health																												
	CPMK2	Compare and select appropriate water conservation techniques in developing health programs																												
	CPMK3	Demonstrate skills in water pollution analysis techniques																												
	CPMK4	Employ basics of ethics and law in evaluating environmental health problems																												
Pemetaan CPL dengan CPMK	<table border="1"> <thead> <tr> <th></th> <th>CPMK 1</th> <th>CPMK 2</th> <th>CPMK 3</th> <th>CPMK 4</th> </tr> </thead> <tbody> <tr> <td>ELO 1</td> <td></td> <td></td> <td></td> <td>X</td> </tr> <tr> <td>ELO 2</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>ELO 3</td> <td></td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>ELO 4</td> <td></td> <td>x</td> <td></td> <td></td> </tr> </tbody> </table>						CPMK 1	CPMK 2	CPMK 3	CPMK 4	ELO 1				X	ELO 2	x				ELO 3			X		ELO 4		x		
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ELO 1				X																										
ELO 2	x																													
ELO 3			X																											
ELO 4		x																												
Deskripsi Singkat Mata Kuliah	This course discusses hydrology and water conservation related to environmental health, especially in the context of public health. Water in hydrology is a basic need for humans, without water there is no life on this earth. Daily water needs are inseparable from quantity and quality requirements. The need for quantity and quality that is not met will cause health problems. Water is obtained from various sources by means. The use of water produces a by-product in the form of waste, which can cause pollution in various water sources. Ways of providing water comes with advantages and disadvantages. Water is a renewable natural resource, but still has limitations. Therefore water as a natural resource needs to be conserved. The ways of conservation in various water sources are discussed in this course with the aim that water resources can be guaranteed both in quantity and quality. Several case studies related to water pollution and ways of conserving water are discussed. Field excursions to see conservation practices are carried out to complete this course																													
Bahan Kajian/Materi Pembelajaran	<ol style="list-style-type: none"> Introduction Hydrology Cycle and Process Water use and quality Water use and waste Water pollution Pollution in various water sources Case study on water use and pollution Principles of water conservation Conservation in various water sources 1 Conservation in various water sources 2 Approaches in water conservation Case Study : community participation in water conservation Field study : water conservation techniques 																													
Metode Penilaian dan Kaitan dengan CPMK	<table border="1"> <thead> <tr> <th>Komponen Penilaian</th> <th>Persentase</th> <th>CPMK 1</th> <th>CPMK 2</th> <th>CPMK 3</th> <th>CPMK 4</th> </tr> </thead> <tbody> <tr> <td>Exam</td> <td>40%</td> <td>x</td> <td>x</td> <td></td> <td></td> </tr> <tr> <td>Discussion</td> <td>10%</td> <td>x</td> <td>x</td> <td>x</td> <td>X</td> </tr> <tr> <td>Coursework</td> <td>30%</td> <td>x</td> <td>x</td> <td>x</td> <td>X</td> </tr> </tbody> </table>					Komponen Penilaian	Persentase	CPMK 1	CPMK 2	CPMK 3	CPMK 4	Exam	40%	x	x			Discussion	10%	x	x	x	X	Coursework	30%	x	x	x	X	
Komponen Penilaian	Persentase	CPMK 1	CPMK 2	CPMK 3	CPMK 4																									
Exam	40%	x	x																											
Discussion	10%	x	x	x	X																									
Coursework	30%	x	x	x	X																									
Daftar Bahan dan Referensi	<ol style="list-style-type: none"> Clark, J.W., Viesman, W., and Hammer, J.M., 1977, <i>Water Supply and Pollution Control</i>, Harper and Raw, New York. 																													

2. Chapman , D., (ed). 1992. *Water Quality Assessments, A Guide to the Use of Biota, Sediments and Water in Environmental Monitoring*. Chapman and Hall. London
3. Dix, H.M., 1981, *Environmental Pollution*, John Willey and Sons, New York.
4. Fetter, C.W., 1988, *Applied Hydrogeology*, Merrill Publishing Co. Columbus, Ohio.
5. Fuad Amsyari, 1982, *Prinsip-Prinsip Masalah Pencemaran Lingkungan*, Ghalia, Jakarta.
6. Hem, J.D, 1970, Study and Interpretation of the Chemical Characteristic of Natural Water, *US. Geological Survey Water Supply Paper, No. 1473*, Government Printing Office, Washington.
7. Kantor Menteri KLH, 1990, *Kualitas Lingkungan di Indonesia 1990*, Kantor Menteri KLH, Jakarta.
8. Manahan, S.E., 1977, *Environmental Chemistry*, Willard Grand Press, Boston.
9. MetCalf and Eddy, Inc. 1979, *Wastewater Engineering: Treatment/ Disposal/Reuse*, McGraw Hill Co., New York.
10. Miller, G.T., 1991. *Environmental Science Sustaining the Earth*. Wadsworth Publ. Co. Belmont, California.
11. Montarchih, L., 2010. *Hidrologi Teknik Dasar*. Citra, Malang.
12. Slaymaker, O. and Spencer, T., 1998. *Physical Geography and Global Environmental Change*. Addison Wesley Longman Singapore, Singapore.
13. Sudarmadji, Suprayogi, S. Dan Setiadi, 2012. *Konservasi Mata Air Berbasis Masyarakat di Kabupaten Gunungkidul*. Sekolah Pascasarjana, UGM, Yogyakarta.
14. Sudarmadji, 2013. *Mata Air: Perspektif Hidrologis dan Lingkungan*. Sekolah Pascasarjana UGM, Yogyakarta.
15. Sudarmadji, 2014. *Potret Masalah Lingkungan Sekitar Jalan Perkotaan*. Deepublish, Yogyakarta
16. Tebbut, T. H. Y., 1976, *Principle of Water Quality Control*, Department of Civil Engineering, University of Birmingham, Birmingham.
17. Todd, D. K. and Mays, L.W., 2005, *Groundwater Hydrology, 3rd ed*. John Willey and Sons, New York.
18. Travis, C.C., and Etnier, E. L. (ed), 1984, *Groundwater Pollution Environmental and Legal Problems*, Westview Press Inc., Colorado.
19. Varsney, C. K., 1981, *Groundwater Pollution and Management Reviews*, South Asian Publisher Ltd., New Delhi.
20. Ji, Z.G., 2008. *Hydrodynamics and Water Quality, Modelling Rivers, Lakes and Estuaries*. Jhon Wiley and Sons.

Nama Dosen Pengampu (Team Teaching)	Prof. Dr. Sudarmadji, M.Eng., Sc Dr. M. Widyastuti, MT.			
Otorisasi	Tanggal Penyusunan	Koordinator Mata Kuliah	Koordinator Bidang Keahlian (Jika Ada)	Ketua Program Studi
		Tanda Tangan Nama Terang	Tanda Tangan Nama Terang	Tanda Tangan Nama Terang

Rencana Kegiatan Pembelajaran Mingguan (RKPM)

Minggu Ke-	Sub-CPMK (Kemampuan Akhir yang Direncanakan)	Metode Penilaian			Bahan Kajian (Materi Pembelajaran)	Metode Pembelajaran	Beban Waktu Pembelajaran	Pengalaman Belajar Mahasiswa	Media Pembelajaran	Pustaka dan Sumber Belajar Eksternal
		Indikator	Komponen	Bobot (%)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Students are expected to be able to explain the relationship between hydrology with society and the environment	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Introduction	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	Clark, J.W., Viesman, W., and Hammer, J.M., 1977, <i>Water Supply and Pollution Control</i> , Harper and Raw, New York. Chapman , D., (ed). 1992. <i>Water Quality Assessments, A Guide to the Use of Biota, Sediments and Water in Environmental Monitoring</i> . Chapman and Hall. London
2	Students are expected to be able to summarize the hydrological cycle and process	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Hydrology Cycle and Process	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	Dix, H.M., 1981, <i>Environmental Pollution</i> , John Willey and Sons, New York. Fetter, C.W., 1988, <i>Applied Hydrogeology</i> , Merrill Publishing Co. Columbus, Ohio.
3	Students are expected to be able to describe the types of water use and water sources used Students are expected to be able to describe water quality	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Water use and quality	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	Fuad Amsyari, 1982, <i>Prinsip-Prinsip Masalah Pencemaran Lingkungan</i> , Ghalia, Jakarta. Hem, J.D, 1970, Study and Interpretation of the Chemical Characteristic of Natural Water, <i>US. Geological Survey Water Supply Paper, No. 1473</i> , Government Printing Office, Washington.

	requirements for various purposes									Kantor Menteri KLH, 1990, <i>Kualitas Lingkungan di Indonesia 1990</i> , Kantor Menteri KLH, Jakarta.
4	Students are expected to be able to explain the impact of waste on the environment	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Water use and waste	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	Manahan, S.E., 1977, <i>Environmental Chemistry</i> , Willard Grand Press, Boston. MetCalf and Eddy, Inc. 1979, <i>Wastewater Engineering: Treatment/ Disposal/Reuse</i> , McGraw Hill Co., New York.
5	Students are expected to describe the relationship between water pollution and health	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Water pollution	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	Miller, G.T., 1991. <i>Environmental Science Sustaining the Earth</i> . Wadsworth Publ. Co. Belmont, California.
6	Students are expected to be able to explain the process of water pollution in various water sources	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Pollution in various water sources	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	Montarchih, L., 2010. <i>Hidrologi Teknik Dasar</i> . Citra, Malang. Slaymaker, O. and Spencer, T., 1998. <i>Physical Geography and Global Environmental Change</i> . Addison Wesley Longman Singapore, Singapore
7	Students are able to evaluate the use of water for household use, water pollution, and its impact on the environment	Submit coursework	Coursework	10%	Case study on water use and pollution	Seminar/presentation	2 x 50 minutes	Seminar	Paper	Sudarmadji, Suprayogi, S. Dan Setiadi, 2012. <i>Konservasi Mata Air Berbasis Masyarakat di Kabupaten Gunungkidul</i> . Sekolah Pascasarjana, UGM, Yogyakarta. Sudarmadji, 2013. <i>Mata Air: Perspektif Hidrologis dan Lingkungan</i> . Sekolah Pascasarjana UGM, Yogyakarta

8	Understand the principles of water conservation from various kinds of water sources, especially those in the form of appropriate technology that is applied in the community				Principles of water conservation	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	<p>Sudarmadji, 2014. <i>Potret Masalah Lingkungan Sekitar Jalan Perkotaan</i>. Deepublise, Yogyakarta</p> <p>Tebbut, T. H. Y., 1976, <i>Principle of Water Quality Control</i>, Department of Civil Engineering, University of Birmingham, Birmingham</p> <p>Todd, D. K. and Mays, L.W., 2005, <i>Groundwater Hydrology, 3rd ed.</i> John Willey and Sons, New York.</p>
9	Students are able to compare water conservation techniques from various sources	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Conservation in various water sources 1	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	<p>Travis, C.C., and Etnier, E. L. (ed), 1984, <i>Groundwater Pollution Environmental and Legal Problems</i>, Westview Press Inc., Colorado.</p>
10	Students are able to compare water conservation techniques from various sources	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Conservation in various water sources 2	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	<p>Varsney, C. K., 1981, <i>Groungwater Pollution and Management Reviews</i>, South Asian Publisher Ltd., New Delhi.</p> <p>Ji, Z.G., 2008. <i>Hydrodynamics and Water Qualiy, Modelling Rivers, Lakes and Estuaries</i>. Jhon Wiley and Sons.</p>
11	Students are expected to be able to compare various approaches to water conservation.	Active in discussion Answer exam correctly	Discussion Exam	1% 4%	Approaches in water conservation	Face-to-face and classroom discussion	2 x 50 minutes	Discussion	Powerpoint presentation	

	Students are expected to be able to appropriately select a water conservation approach for a variety of contexts									
12	Students are expected to be able to evaluate community participation in water conservation	Submit coursework	Coursework	10%	Case Study : community participation in water conservation	Case study	2 x 50 minutes	Seminar	Paper	
13	Students are expected to be able to demonstrate water source identification techniques and water pollution. Students are expected to be able to demonstrate water conservation techniques	Demonstrate appropriate techniques and submit coursework	Coursework	10%	Field study : water conservation techniques	Field study	2 x 50 minutes	Field observation	pH meter ECmeter	

Keterangan :

Penilaian pembelajaran (3), (4), (5) dapat berupa:

Metode:

Tatap muka: observasi, tes tertulis, kuis, dsb

Daring: tugas *essay*, *feedback*, penilaian teman sejawat, penyusunan proposal, penyusunan paper, dsb

Instrumen

Tatap muka: soal *essay*, dsb

Daring: pilihan ganda, dsb

Bobot nilai

Bahan kajian (6) dapat berupa:

Sumber belajar yang diberikan oleh pengampu MK, jelaskan substansinya

Sumber belajar yang diperoleh mahasiswa secara online dalam bentuk teks, *slides*, *audio*, *video* dsb, jelaskan substansinya.

Metode pembelajaran (7) dapat berupa:

Metode tatap muka: pemaparan, *collaborative learning*, *problem based learning*, dsb

Metode daring: *self learning*, tugas terstruktur, *essay writing*, dsb

Beban waktu pembelajaran (8):

Tatap muka 2 x 50 menit, atau

Daring 2 x 60 menit belajar mandiri, 2 x 60 menit tugas terstruktur

Pengalaman belajar/aktivitas mahasiswa (9) dapat berupa:

Tatap muka: belajar berkelompok, berdiskusi, berdebat secara konstruktif, pemecahan masalah, dsb

Daring: belajar mandiri, berlatih mengkaji literature, berlatih menulis *essay*, dsb

Media pembelajaran (10) dapat berupa:

Tatap muka: computer, in focus, alat tulis, alat peraga, dsb

Daring: computer, *gadget*, akses internet, dsb