

KSH 444 Urban Forestry Science

Credit	: 3(2-3)
Semester	: 7 (odd)
Course format	: Lectures, individual assignment, course practice and fieldtrip. 100 minutes per week, 14 weeks
Pre-requisite	: -
Lecturers	: Dr. Endes N. Dachlan MS (Course coordinator) Mr. Rachmad Hermawan, MSc. F

Course Description

This course describes the environmental management of urban areas into green city by using forest as agent for environmental management to produce high quality (good, healthy, cool, aesthetic and comforting) with higher ecology and economic carrying capacity. Motto: "***Urban forest for eco and human health***".

To be more specific, this course describes :

- a) Meaning of city and its problems
- b) Meaning of urban forestry, problems and benefits with regard to environmental management
- c) Determination of area, type and form of urban forest
- d) Species selection, tree plantation and maintenance in urban forest
- e) Planning steps in developing urban forest

Course Objectives

City is the centre of many activities that require high environmental carrying capacity. Nevertheless, cities' environmental qualities are decreasing. One effort to overcome such problem is by developing a good and quality urban forest, meaning that it can function to overcome environmental problems that are occurring or will occur in the future. Therefore, cities can play important roles in establishing a nation's strength and future.

Learning Outcomes

1. General learning outcomes

Upon successful completion of this course the students will be able to:

Explain the basic principles of managing urban forest to improve environmental quality of urban areas and as an effort in natural resources ex-situ conservation to provide good urban environmental quality indications.

Structure of Course Delivery

1. Lectures.
2. Individual assignment
3. Course practice
4. Fieldtrip

Major References

1. Alexander, S.A. dan J. E. Barnard. 1996. Forest Health Monitoring (Field Methods Guide). USDA Forest
2. Craul, P. 1992. Urban Soil in Landscape Design. John Wiley and Sons. New York
3. Dahlan, E. N. 1992. Hutan Kota : Untuk Pengelolaan dan Peningkatan Kualitas Lingkungan Hidup. Asosiasi Pengusaha Hutan Indonesia. Jakarta
4. _____,.,. 2004. Membangun Kota Kebun (Garden City) Bernuansa Hutan Kota.
5. Fakuara, Y. 1988. Hutan Kota : Peranan dan Permasalahannya. Jurusan Manajemen Hutan Fakultas Kehutanan
6. Fakultas Kehutanan IPB. 1987. Konsepsi Pengembangan Hutan Kota. Kerjasama antara Setjen
7. Fakultas Kehutanan IPB. 1987. Konsepsi Pengembangan Hutan Kota. Kerjasama antara Setjen Departemen Kehutanan dengan Fakultas Kehutanan IPB.
8. Grey, G. W. dan F. I. Deneke. 1978. Urban Forestry. John Wiley and Sons. New York
9. Haller, J. M. 1986. Tree Care : A Comprehensive Guide to Planting, Nurturing, Repairing and Protecting Trees. Macmillan Publishing Company. New York.
10. Honaschfsky, W.B. 2000. Ecologically Based Municipal Land Use Planning. Lewis Publishers, New York
11. Martin, M.H. dan P.J. Coughtrey. 1980. Biological Monitoring of Heavy Metal Pollution (Land and Air). Applied Science Publishers, London.
12. Miller, R.W. 1988. Urban Forestry : Planning and Managing Urban Greenspaces. Prentice Hall, Englewood Cliffs, New Jersey.

Teaching Material Support

The choice of media and type of technology use include:

1. Face-to-face contact.
2. Printed power point presentation.
3. Computer
4. Projector Infocus

Course Outline

Topics	Sub-topics	Bloom's Taxonomy	Week
Urban areas and their problems	<ol style="list-style-type: none"> 1. Meaning of urban area 2. History of urban development and urban development efforts 3. Zonation in urban areas 4. Types of urban environmental degradation 5. Demographic problems 	C1, C2	I
History and meaning of urban forest	<ol style="list-style-type: none"> 1. Relations between man and forest: then and now 2. Types of urban greeneries that have been carried out 3. Change of human life patterns and their impacts on natural resources 4. Meanings of urban forest 	C1, C2	II
Study of urban forest related problems	<ol style="list-style-type: none"> 1. Local/regional governments policies 2. Spatial plan 3. Community participation 4. Urban forest development 5. others 	C1, C2, C3	III
Roles of urban forest	<ol style="list-style-type: none"> 1. Protection benefit 2. Preservation benefit 3. Aesthetic and wellbeing benefits 4. Production benefit 5. Recreation benefit 6. Specific benefits 	C1, C2	IV, V, VI
Area of urban forest	<ol style="list-style-type: none"> 1. Based on urban protected areas 2. Based on oxygen needs 3. Based on water needs 4. Based on current regulations 	C1, C2, C3, C4	VII
Type and form of urban forest	<ol style="list-style-type: none"> 1. Type of urban forest (protection, settlement, industry, recreation, germ plasm preservation, centre, etc) 2. Form of urban forest (green lane, garden, home garden, forest) 	C1, C2, C3, C4	VIII
Impact of environmental stress on plants	<ol style="list-style-type: none"> 1. Plant resistance 2. Macroscopic and microscopic damages 3. Plant adaptation 	C1, C2, C3, C4	IX
Species selection for urban forest	<ol style="list-style-type: none"> 1. Edaphic requirements 2. Climatic requirements 3. Silvicultural requirements 4. Plant general requirements 5. Aesthetic requirements 6. Specific benefits requirements 	C1, C2, C3, C4	X

Topics	Sub-topics	Bloom's Taxonomy	Week
Planting methods	<ol style="list-style-type: none"> 1. Site selection 2. Cycle preparation 3. Replantation 4. Spraying 5. Fertilizing 6. Penyanggaan/ pengajiran 7. Pembalutan 8. Thinning 9. Hormone insertion 	C1, C2, C3, C4	XI
Evaluation of tree damage level	<ol style="list-style-type: none"> 1. Types of tree damages 2. Quantification of tree damage value 	C1, C2, C3, C4	XII
Risk management of trees	<ol style="list-style-type: none"> 1. Identification of dangerous tree condition 2. Wound treatment on branch 3. Thinning of dangerous trees 4. Cutting of dangerous trees 	C1, C2, C3, C4	XIII
Planning of urban forest development	<ol style="list-style-type: none"> 1. Inventory of potential data and obstacles: biophysics, chemical, technical, socio-economic and culture, and current regulations 2. Data synthesis 3. Data analysis 4. Determination of urban forest zonation 5. Selection of alternative type and forms of urban forest 	C1, C2, C3, C4, C5	XIV

Potential Course Overlap

There are no potential overlap with other courses.

Evaluation and Grading

1. Quizzes

Quizzes in the form of 2-3 short essay questions will be given to provide the students feedbacks on their course performance. The quiz may be given before or just before end of lecture and will cover a topic discussed in the previous lecture. The quiz will be held approximately \pm 10 minutes.

2. Midterm Examination

Midterm examination will be held during examination period scheduled by Registrar's office (after 7 weeks lecture). Each exam is composed 100% essay. Length of the exam is 90-120 minutes. The exam will cover course topics delivered in week 1-7. A key and score will be attached on announcement board after exam paper is graded.

3. Final Examination

Final examination will be held during examination period scheduled by Registrar's office (after 14 weeks lecture). Each exam is composed True-False (25), Multiple Choice (25), Pair question (20) and essay (10). Length of the exam is 90-120 minutes. The exam will cover course topics delivered in week 8-14. A key and score will be attached on announcement board after exam paper is graded.

4. Assigned Paper

Group of student are required to submit assigned papers. This assigned papers or reports are objected to help students make connection between lecture material and field application, through case study reports. The due date of the reports submission is one week after during lecture period. Standardized format for paper writing is expected. The reports are graded based on formulas and calculation format.

5. Assigned Paper

Group of student are required to submit assigned papers. This assigned papers or reports are objected to help students make connection between lecture material and field application, through case study reports. The due date of the reports submission is one week after during lecture period. Standardized format for paper writing is expected. The reports are graded based on formulas and calculation format.

Compositions of grading are as follows:

Assessment Tools	Maximum Score	% of Grade
Quizzes	100	15
Structured Assignments	100	15
Assigned Paper	100	15
Midterm Examination	100	25
Final Examination	100	25

Final grade classification: A (≥ 85); B (75-84); C (65-74); D (55-64); E (<55)

**Coverage of DFORCE Core Competence
in Urban Forestry Science (KSH 444)**

Code : KSH 444
Course : Urban Forestry Science
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Code	Core Competencies	Course Content Covered	Cognitive Level	Topic
I	Students will be able to identify urban areas related problems	Meaning of urban area	C1, C2	Urban areas and their problems
		History of urban development and urban development efforts		
		Zonation in urban areas		
		Types of urban environmental degradation		
		Demographic problems		
II	Students will be able to understand history and meaning of urban forest	Relations between man and forest: then and now	C1, C2	History and meaning of urban forest
		Types of urban greeneries that have been carried out		
		Change of human life patterns and their impacts on natural resources		
		Meanings of urban forest		
III	Students will be able to identify various problems related to urban forest management	Local/regional governments policies	C1, C2, C3	Study of urban forest related problems
		Spatial plan		
		Community participation		
		Urban forest development		
		Others		
IV	Students will be able to understand the roles of urban forest	Protection benefit	C1, C2	Roles of urban forest
		Preservation benefit		

Code	Core Competencies	Course Content Covered	Cognitive Level	Topic
		Aesthetic and wellbeing benefits		
		Production benefit		
		Recreation benefit		
		Specific benefits		
V	Students will be able to determine the area of urban forest	Based on urban protected areas	C1, C2, C3, C4	Area of urban forest
		Based on oxygen needs		
		Based on water needs		
		Based on current regulations		
VI	Students will be able to categorized type and forms of urban forest	Type of urban forest (protection, settlement, industry, recreation, germ plasm preservation, centre, etc)	C1, C2, C3, C4	Type and form of urban forest
		Form of urban forest (green lane, garden, home garden, forest)		
VII	Students will be able to understand impacts of environmental stress on plants	Plant resistance	C1, C2, C3, C4	Impact of environmental stress on plants
		Macroscopic and microscopic damages		
		Plant adaptation		
VIII	Students will be able to select plant species based on objectives and site condition	Edaphic requirements	C1, C2, C3, C4	Species selection for urban forest
		Climatic requirements		
		Silvicultural requirements		
		Plant general requirements		
		Aesthetic requirements		
		Specific benefits requirements		
IX	Students will be able to understand planting methods	Site selection	C1, C2, C3, C4	Planting methods
		Cycle preparation		
		Replantation		
		Spraying		
		Fertilizing		
		Penyanggaan/ pengajiran		
		Pembalutan		
		Thinning		
		Hormone insertion		

Code	Core Competencies	Course Content Covered	Cognitive Level	Topic
X	Students will be able to evaluate tree damage level	Types of tree damages	C1, C2, C3, C4	Evaluation of tree damage level
		Quantification of tree damage value		
XI	Students will be able to explain risk management of trees	Identification of dangerous tree condition	C1, C2, C3, C4	Risk management of trees
		Wound treatment on branch		
		Thinning of dangerous trees		
		Cutting of dangerous trees		
XII	Students will be able to explain planning steps in urban forest development	Inventory of potential data and obstacles: biophysics, chemical, technical, socio-economic and culture, and current regulations	C1, C2, C3, C4, C5	Planning of urban forest development
		Data synthesis		
		Data analysis		
		Determination of urban forest zonation		
		Selection of alternative type and forms of urban forest		

**Assessment Tools to Measure the Achievement of
Learning Outcomes in Urban Forestry Science (KSH 444)**

Code : KSH 444

Course : Urban Forestry Science

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Code	Core Competencies	Learning Outcomes	Bloom's Taxonomy	Assessment Tool(s)	Learning Activities
I	Students will be able to identify urban areas related problems	Students will be able to identify urban areas related problems	C1, C2	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion
II	Students will be able to understand the history and meaning of urban forest	Students will be able to explain history and meaning of urban forest	C1, C2	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion
III	Students will be able to identify various problems related to urban forest management	Students will be able to identify various problems related to urban forest management	C1, C2, C3	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion
IV	Students will be able to understand the roles of urban forest	Students will be able to explain the roles of urban forest	C1, C2	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion
V	Students will be able to determine the area of urban forest	Students will be able to determine the area of urban forest	C1, C2, C3, C4	Written examinations at different cognitive level (mid-term exam).	Classroom lecture and discussion
VI	Students will be able to categorized type and forms of urban forest	Students will be able to categorized type and forms of urban forest	C1, C2, C3, C4	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion
VII	Students will be able to understand impacts of environmental stress on plants	Students will be able to explain impacts of environmental stress on plants	C1, C2, C3, C4	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion
VIII	Students will be able to	Students will be able to	C1, C2, C3, C4	Written examinations at	Classroom lecture and

Code	Core Competencies	Learning Outcomes	Bloom's Taxonomy	Assessment Tool(s)	Learning Activities
	select plant species based on objectives and site condition	select plant species based on objectives and site condition		different cognitive level (final exam).	discussion
IX	Students will be able to understand planting methods	Students will be able to explain planting methods	C1, C2, C3, C4	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion
X	Students will be able to evaluate tree damage level	Students will be able to evaluate tree damage level	C1, C2, C3, C4	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion
XI	Students will be able to understand risk management of trees	Students will be able to explain risk management of trees	C1, C2, C3, C4	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion
XII	Students will be able to understand planning steps in urban forest development	Students will be able to explain planning steps in urban forest development	C1, C2, C3, C4, C5	Written examinations at different cognitive level (final exam).	Classroom lecture and discussion