



FACULTY OF ENGINEERING
YOGYAKARTA STATE UNIVERSITY

SYLLABUS OF REINFORCED CONCRETE STRUCTURES I

No. SIL/TSP/SPR 230

Revision: 00

JULY 2, 2009

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COURSE	: REINFORCED CONCRETE STRUCTURES I
COURSE CODE	: SPR 230 (2 CREDITS, THEORY)
SEMESTER	: ODD (September – February)
STUDY PROGRAM	: CIVIL ENGINEERING AND PLANNING EDUCATION
INSTRUCTOR	: SLAMET WIDODO, S.T., M.T.

I. DESCRIPTION

SPR 230 is a practical analysis design of current building-code (SNI 2847: 2013) based course, primarily covering reinforced concrete (RC) analysis and design for structures. This course introduce the mechanical properties of RC materials, design and investigation concepts and their application to reinforced concrete structural elements (RC plate/ slab and beam), develop a working knowledge of the relations between applied loads and their effects on structures, develop adequate skill in investigating (analysis) capacity of reinforced concrete structural components and selecting (designing) reinforced concrete members to support a specified load, mainly on flexural reinforcement of plate/ slab and beam, and shear/ stirrup reinforcement of RC beam.

II. COURSE OBJECTIVES (DEVELOPED COMPETENCIES)

1. Explain the working principles of reinforced concrete structures based on the characteristics of its materials.
2. Calculate the load combination which should be applied on reinforced concrete building structures.
3. Design longitudinal steel reinforcement of one-way slab structures.
4. Design longitudinal steel in the structure of two-way slab structures.
5. Analyze the flexural capacity of singly reinforced RC beam.
6. Analyze the flexural capacity of doubly reinforced RC beam.
7. Analyze the flexural capacity of T and inverted-L RC beam.
8. Design flexural/ longitudinal reinforcement of RC beam.
9. Design stirrup (shear reinforcement) on the beam element.
10. Draw details of reinforcement on plates and beams structures.

III. INDICATORS OF ACHIEVED COMPETENCE

A. Cognitive and Thinking Skills Aspects

1. Explain the working principles of reinforced concrete structures based on the characteristics of its materials.

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2. Calculate the load combination which should be applied on reinforced concrete building structures.
3. Design longitudinal steel reinforcement of one-way slab structures.
4. Design longitudinal steel in the structure of two-way slab structures.
5. Analyze the flexural capacity of singly reinforced RC beam.
6. Analyze the flexural capacity of doubly reinforced RC beam.
7. Analyze the flexural capacity of T and inverted-L RC beam.
8. Design flexural/ longitudinal reinforcement of RC beam.
9. Design stirrup (shear reinforcement) on the beam element.

B. Psychomotor Aspects

1. Draw details of flexural reinforcement applied for one-way and two-way slabs structures based on SNI 2847: 2013.
2. Draw details of flexural reinforcement applied for beam elements based on SNI 2847: 2013.
3. Draw details of shear reinforcement (stirrup) applied for beam elements based on SNI 2847: 2013.

C. Affective, Social Skills, and Personality aspects

1. Having accuracy and precision in interpreting the reinforced concrete design and analysis codes.
2. Able to perform analysis and design with concentration, thorough, and meet the given time allocation.
3. Having a sense of responsibility and discipline in doing their jobs.
4. Develop the ability to participate as a member of a team work, and expressing his/her opinion in problem solving through discussion forums (held in presentations and evaluation activities of RC structures design / assignment).
5. Open minded and responsive in accepting evaluation and inputs from their counterparts.

IV. RECOMMENDED TEXTBOOKS:

1. ACI Committee 318, (2008), *Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary*, American Concrete Institute.
2. Badan Standarisasi Nasional, (2013), *SNI 1727: 2013: Beban Minimum untuk Perancangan Bangunan Gedung dan Struktur Lain*, Badan Standardisasi Nasional.
3. Badan Standarisasi Nasional, (2013), *SNI 2847: 2013: Persyaratan Beton Struktural untuk Bangunan Gedung*, Badan Standardisasi Nasional.

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4. Gideon Hadi Kusuma dan Vis, W.C., (1994), *Dasar-dasar Perencanaan Beton Bertulang Berdasarkan SK SNI T-15-1991-03*, Jakarta: Penerbit Erlangga.
5. Istimawan Dipohusodo, (1999), *Struktur Beton Bertulang*, Jakarta: Gramedia Pustaka Utama.
6. Park, R. and Paulay, T., (1975), *Reinforced Concrete Structures*, New York: John Wiley & Sons. Inc.
7. Nawy, E.G., (1996), *Reinforced Concrete: A Fundamental Approach 3rd edition*, New York: Prentice Hall.

V. GRADING

The final grades for the course will be based on the following percentages:

1. Homework	10%
2. Project	30%
3. Exams	30%
4. Final Exam	30%
Total	100%

TABLE OF ACHIEVEMENT ON TARGETED COMPETENCE

No.	Grade	Requirements
1.	A	Granted for students who collected at least 86 point
2.	A-	Granted for students who collected at least 80 point
3.	B+	Granted for students who collected at least 75 point
4.	B	Granted for students who collected at least 71 point
5.	B-	Granted for students who collected at least 66 point
6.	C+	Granted for students who collected at least 64 point
7.	C	Granted for students who collected at least 56 point

COURSE OUTLINE

Week	Basic competence	Topics	Teaching-Learning Strategy	references
1-2	Explain the working principles of reinforced concrete structures.	1. Concrete 2. Steel Reinforcement bar 3. Reinforced concrete structures	1. Presentation 2. Discussion	IV 1, 3, 6, 7

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		systems/types 4. Strength and Serviceability concept		
3-4	Calculate the load combination which should be applied on reinforced concrete building structures.	1. Types and design loads value 2. Load Combinations 3. Acceptable practical approaches for indeterminate structural analysis	1. Presentation 2. Discussion 3. Supervised assignment	IV 1, 2, 3, 7
5-7	Design longitudinal steel reinforcement of slab structures.	1. One-way slabs 2. two-way slabs 3. Detailed engineering drawing.	1. Presentation 2. Discussion 3. Supervised assignment	IV 1, 3, 4, 7
8	Mid-term exam			
9-11	Analyze the flexural capacity of singly reinforced RC beam.	1. Singly reinforced RC beams 2. Doubly reinforced RC beams 3. T and Inverted-L RC beams.	1. Presentation 2. Discussion 3. Supervised assignment	IV 1,3, 5-7
12-13	Design flexural/ longitudinal reinforcement of RC beam.	1. Simple beams. 2. Continuous beams. 3. detailed engineering drawing	1. Presentation 2. Discussion 3. Supervised assignment	IV 1,3, 5-7
15-16	Design stirrup/ shear reinforcement of RC beam.	1. Simple beams. 2. Continuous beams. 3. detailed engineering drawing	1. Presentation 2. Discussion 3. Supervised assignment	IV 1,3, 5-7
16	Mid-term exam			

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