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| **UNIVERSITAS PELITA HARAPAN** |  | **Rencana Pembelajaran Semester** | | | |
|  |  | |  |  |
|  | **Faculty, Department** |  | **Teknik Informatika** | |
|  |  |  |  | |
|  | **Catalog Number** |  | **INF 11262** | |
|  |  |  |  | |
|  | **Course Name** |  | **Arsitektur Piranti Lunak** | |
|  |  |  |  | |
|  | **Credit** |  | **2 sks** | |
|  |  |  |  | |
|  | **Academic Year** |  | **2019/2020** | |
|  |  |  |  | |
|  | **Semester / Term** |  | **Akselerasi** | |
|  |  |  |  | |
|  | **Day, Time** |  | **Selasa, 09:15 – 11:45; Kamis 08:15-10:45** | |
|  |  |  |  | |
|  | **Lecturer(s), contact Info.** |  | **Dr.Eng., Ir. Pujianto Yugopuspito, MSc.**  **Dr. Soetrisno, S.E., M.Kom.** | |

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| **COURSE DESCRIPTION** |
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| Software architecture is aiming to introduce student about the important aspect of software in the early stage of development. This course will equip student with the basic knowledge of a career path of a software architect development. This course discusses the architecture and design of complete software systems, building on components and patterns. Topics include architectural principles and alternatives, understanding quality attributes, taxonomy of software architecture patterns, including methodologies for design of software architectures, and aware of challenging cloud and beyond software architectures. |

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| **GENERAL INSTRUCTIONAL OBJECTIVE(S)** |
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| Setelah menyelesaikan mata kuliah ini mahasiswa akan memiliki kemampuan:   1. Dapat memahami konsep arsitektur piranti lunak 2. Dapat menganalisis kebutuhan atribut piranti lunak 3. Dapat mendokumentasikan arsitektur piranti lunak 4. Dapat memahami perkembangan teknologi terkait arsitektur piranti lunak terkini. |

| **COMPETENCIES (Specific Instructional Objectives)** | | |
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| **A1** |  | Mampu menjelaskan kembali konsep arsitektur piranti lunak. |
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| **A2** |  | Mampu merekonstruksi kebutuhan *quality attributes* pada piranti lunak |
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| **A3** |  | Mampu menganalisis piranti lunak untuk mendapatkan *architecture* *pattern* |
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| **A4** |  | Mampu membeda variasi pola arsitektur piranti lunak |
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| **A5** |  | Mampu mendokumentasikan arsitektur piranti lunak. |
| **A6** |  | Mampu memprediksi perkembangan teknologi pada arsitektur piranti lunak. |
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| **PRE-REQUISITE(S) (if any)** |
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| 1. Any Programming Languages 2. Knowledge of Unified Modelling Language (UML). |
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| **TOOLS** |  | Referensi, Assessment, Rubrik penilaian, Ujian |

| **LEARNING STRATEGIES** | | |
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| **INDIVIDUAL STUDY** |  | **CLASSROOM ACTIVITIES** |
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| 1. Mempelajari bahan perkuliahan |  | 1. Mengajar |
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| 1. Membuat dokumen perbaikan kode program |  | 1. Menyiapkan assessment |
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| 1. Bertanya dan berpartisi aktif dalam diskusi kelas. |  | 1. Menyiapkan ujian |
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| **CLASS POLICY** |
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| 1. Mahasiswa wajib masuk kelas dengan keadaan siap untuk belajar dan berpakaian sopan serta tidak memakai sandal. 2. Mahasiswa hadir tepat waktu dan menandatangani daftar presensi. Mahasiswa dianggap absen kuliah apabila terlambat 30 menit atau lebih sejak kelas dimulai. Mahasiswa tidak diperkenankan mengikuti ujian akhir semester apabila absen kuliah lebih dari 2 (dua) kali. 3. Jika mahasiswa tidak hadir kuliah karena sakit atau kematian anggota keluarga inti maka ia wajib  * memberitahu dosen bersangkutan mengenai alasan ketidakhadiran melalui e-mail atau sms tidak lebih dari 5 (lima) hari kerja * mengisi form ketidakhadiran kuliah yang dilengkapi dengan dokumen pendukung * surat keterangan sakit dari dokter atau puskesmas   surat keterangan dari orang tua/wali tentang kematian anggota inti keluarga, dilengkapi dengan *copy* KTP orang tua/wali dan no ponsel yang dapat dihubungi |
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| **TEXT BOOKS (MAIN)** |
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|  |
| 1. Len Bass, Paul Clements and Rick Kazman (2013), Software Architecture in Practice, ISBN 978-0321815736. |
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| **ONLINE MATERIALS & RESOURCES** |
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| 1. http://learn.uph.edu 2. http://github.org |
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| **REFERENCES (used in this course)** |
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| **GRADING SCHEME** | | | | |
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| **INDICATORS** |  | **WEIGHT (%)** |  | **COMPETENCIES** |
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| **UAS (30% - 60%)** |  | 30 |  | A3 – A6 : Menerapkan arsitektur piranti lunak |
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| **UTS (20% - 40%)** |  | 30 |  | A1 – A3 : Mengenal konsep arsitektur piranti lunak |
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| **KAT 1** |  | 30 |  | A2 – A5 : Penerapan pada project |
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| **KAT 2** |  | 10 |  | A1 – A6 : Partisipasi |
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| **KAT 3** |  | 0 |  |  |

| **COURSE PLANNER** | | | | | | |
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| **SESSION** | **COMPETENCIES**  **(Knowledge, Skills, & Attitude)** | **TOPICS** | **ACTIVITIES**  **/ LEARNING METHODS** | | **ASSESSMENTS** | **RESOURCES** |
| 1 | Mahasiswa mampu: menjelaskan kembali konsep arsitektur piranti lunak; mengidentifikasikan arsitektur yang baik; menelusur aspek dari arsitektur piranti lunak; | Software Architecture Introduction | * Architectural Structures and Views; * What makes a ‘good architecture; * Exposition of typical software architecture; * Why is Software Architecture Important? | | Mencari *software* untuk dianalisis. | O[1] Slide  M[1] Ch.1, 2 |
| 2 | Mahasiswa mampu menjelaskan kembali stakeholder dan konteksnya dalam arsitektur piranti lunak. | Context of Software Architecture | * Enhancing communication among stakeholder * Vocabulary of Design Alternatives * Technical context * Management context; * Influence of software architecture | | Terlibat dalam dikusi kelas; Mengerjakan Assignment online: Context of SA | O[1] Slide  M[1] Ch. 2, 3 |
| 3 | Mahasiswa mampu menjelaskan kembali prinsip-prinsip pemrograman yang baik. | Understanding Quality Attributes | * Architecture and requirements * Quality attribute Consideration * Specifiying quality attribute requirement; | | Mengerjakan Assignment Online: QA requirements. | O[1] Slide  M[1] Ch. 4 |
| 4 | Mahasiswa mampu merelasikan *concept, scenario dan design checklist* QAs | Exploration of Software Attributes #1 | * General Scenario; * Tactics; * Design Checklist; | | Mengerjakan Assignment Online: Analisis QA | O[1] Slide  M[1] Ch. 5 - 12  O[3] |
| 5 | Mahasiswa mampu merelasikan consep, scenario dan design checklist QAs. | Exploration of Software Attributes #2 | * General Scenario * Tactics; * Design Checklist; | | Mengerjakan Assignment Online: Analisis QA | O[1] Slide  M[1] Ch. 5 - 12 |
| 6 | Mahasiswa mampu merelasikan *tactics* dan *pattern*. | Architectural Tactics and Patterns | * Architectural patterns; * Relationships between tactics and patterns; * Case study | | Mengerjakan Assignment Online: Analisis pattern | O[1] Slide  M[1] 13 |
| 7 | Mahasiswa mampu menganalisis QA dan memodelkannya | Quality Attribute Modeling Analysis | * Modeling architecture to enable QA analysis; * QA checklist; * Experiments, simulations and prototypes; * Case Study | | Mengerjakan Assignment Online: KAT#1 | O[1] Slide  M[1] 14 |
| 8 | Ujian Tengah Semester | | | | | |
| 9 | Mahasiswa mampu mencari ASR; membedakan pendekatan Agile dalam projek. | Architecture and Requirements | * Gathering ASRs from Requirements Documents, Understanding Business Goals, and others * Capturing ASRs in a utility tree * Case Study: Agile Project * Agile Architecture | | Mengerjakan Assignment Online: KAT#1 | O[1] Slide  M[1] 16, 15  O[9] |
| 10 | Mahasiswa mampu menganalisis dan mendokumentasikan arsitektur piranti lunak; | Designing and Documenting Software Architecture | * Design strategy. * Attribute -Driven Design method. * Notation for architecture documentation * Bulding the documentation | | Mengerjakan Assignment Online: KAT#1 | O[1] Slide  M[1] 17, 18 |
| 11 | Mahasiswa mampu merelasikan perbedaan sistem operasi dengan teknik pengembangan piranti lunak; | Architecture Implementation, Testing, Reconstruction and Conformance | | * Architecture and implementation & testing * Architecture reconstruction process; * View of fusion; * Finding violations | Mengerjakan Assignment Online: KAT#1 | O[1] Slide  M[1] 19, 20 |
| 12 | Mahasiswa mampu mengartikulasikan dasar pemahaman refactoring dan menerapkannya; | Architecture Evaluation, Management and Governance | | * Evalution factors * Architecture tradeoff analysis method * Lightweight Architecure Evaluation * Management and Govenrnance | Mengerjakan Assignment online: Architecture Evaluation | O[1] Slide  M[1] 21, 22 |
| 13 | Mahasiswa mampu menganalisis functionality; menguji dan memperbaiki *private* *features* | Architecture Competence | | * Duties, skill and knowledge of architects * Competence of a sotware architecture organization; | Mengerjakan Assignment online: Architecture Competence | O[1] Slide  M[1] 23, 24  O[14] |
| 14 | Mahasiswa mampu membedakan variability pada *software product line*; menjelaskan kembali tugas arsitek piranti lunak. | Architecture and Software Product Lines | | * Product line variability * Working of Software Product Line * Role of a product line architecture * Case study | Mengerjakan Assignment online: Configuration Manajemen | O[1] Slide  M[1] 25  O[] |
| 15 | Mahasiswa mampu mengenali teknologi awan; menjelaskan kembali tinjauan ekonomi dan teknik penerapan arsitekture piranti lunak dengan dukungan *cloud* | The Cloud and Beyond Architectures | | * Service model and deployment options * Economic justification * Sample technology * Implication for architecure; | Class Discussion | O[1] Slide  M[1] 26  O[3] |
| 16 | Ujian Akhir semester | | | | | |

| **ACTIVITIES GUIDE & LEARNING STRATEGY** | | |
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| **No** | **Methods** | **Learning Media / Resource** |
| 1 | Teaching (Speaking) | PC, LCD, Sound-system, mic, AC, etc. |
| 2 | Question - Answer (sharpening) | Microphones (2 sets), Sound-system, AC, etc. |
| 3 | Group Discussion (Guiding) | Classroom and table-chairs for the group members, AC, etc. |
| 4 | Exercise Skill (Training) | PC, LCD, Sound-System, Online internet, wireless microphones, etc. |

**Syllabus Contract**

As a student representative and the instructor of this course, we hereby acknowledge that we have read and understood the course syllabus provided. If anything needs to changed later to improve the teaching and learning process, we will discuss the proposed changes ahead of time and make any changes that would improve the teaching and learning process.

We agree to follow this syllabus which will be put into effect as soon as it has been signed by all parties shown below.

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| 1st Party  Lecturer / Instructor, |  | 2nd Party  Student Representative, |
|  |  |  |
| Dr.Eng. Pujianto Yugopuspito Dr. Soetrisno  Date: 13 May 2020 |  | – Date: \_\_\_\_ May 2020 |
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|  |  |  |
| Approved by  Department Chair, Informatics |  | Acknowledged by  Dean, Computer Science |
|  |  |  |
| Irene Lazarusli, S.Kom. M.T. – Date: 2020 |  | Eric Jobilion, Ph.D. – Date: 2020 |

|  | **RUBRICS** | | | | |
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| **Competency** | **Indicator** | **4** | **3** | **2** | **1** |
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| A1 | Mengenali prinsip arsitektur piranti lunak | Lebih dari empat prinsip | Empat prinsip | Tiga prinsip | Dua prinsip |
| A1 | Menjelaskan kembali konsep arsitektur piranti lunak | Baik Sekali | Baik | Sedang | buruk |
| A2 | Mengenali *quality attributes* pada aplikasi | Lebih dari tiga atribut | Tiga atribut | Dua atribut | Satu atribut |
| A2 | Merekonstruksi *quality attributes* | Lebih dari tiga atribut | Tiga atribut | Dua atribut | Satu atribut |
| A3 | Menemukan architecture pattern dalam aplikasi | Lebih dari tiga pola | Tiga pola | Dua pola | Satu pola |
| A3 | Mengajurkan perbaikan architecture pattern dalam aplikasi | Baik Sekali | Baik | Sedang | buruk |
| A4 | Mengenali perbedaan akibat penerapan architecture pattern | Baik Sekali | Baik | Sedang | buruk |
| A4 | Mengaplikasikan architecture pattern dalam aplikasi | Baik Sekali | Baik | Sedang | buruk |
| A5 | Mengenali kelengkapan arsitektur piranti lunak | Baik Sekali | Baik | Sedang | buruk |
| A5 | Mendokumentsikan arsitektur piranti lunak | Baik Sekali | Baik | Sedang | buruk |
| A6 | Menjelaskan kembali teknologi arsitektur terkini | Baik Sekali | Baik | Sedang | buruk |
| A6 | Memprediksi penerapan teknologi arsitektur di masa depan. | Baik Sekali | Baik | Sedang | Buruk |