UNIVERSITY OF SARGODHA

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

COURSE OUTLINE Spring 2020

Course Title: System Integration and Architecture

Course Code: IT-3544

Credit Hours: *3*

Instructor: Khadija Maryam

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DESCRIPTION & OBJECTIVES

The course plans to instruct understudy about framework mix issues, remembering incorporation for an arrangement of frameworks and alliance of frameworks, job of designs in frameworks coordination, execution and adequacy.

READINGS

1. Len Bass, Ingo Weber, and Liming Zhu, Devops: A Software Architect’s Perspective, Addison‐Wesley Professional, 1st edition, May 28, 2015. ISBN:  978‐0134049847.
2. Gene Kim, Kevin Behr, and George Spafford, The Phoenix Project: A Novel About IT, DevOps, and Helping Your Business, IT Revolution Press, January 10, 2013. ISBN: 978‐0988262577.

3. Enterprise Architecture for Integration: Rapid Delivery Methods and Technologies by Clive Finkelstein, Artech House Print on Demand; 1st Edition (March 31, 2006). ISBN-10: 1580537138

CONTENTS

1. Overview of devops – basic principles and philosophies.
2. The role of the cloud – features of the cloud
3. The role of the cloud – features of the cloud
4. System architecture for devops with micro services
5. Building and testing software and systems
6. Deployment of software and systems.
7. Monitoring and interpreting monitor data
8. Important measures for quantifying software and systems
9. Business considerations including compliance
10. Future directions of develops
11. Strategic Alignment, Activity and Workflow Modeling, and Business Rules: EA Incremental Build Context, Define Strategic Alignment Matrices, Activity Modeling Concepts, Activity-Based Costing, Workflow Modeling, Business Rules for Workflow Modeling. [TB: Ch. 8] [page no 243-271]
12. Using Business Normalization for Future Business Needs:EA Incremental Build Context, Introduction to Normalization, 1st, 2nd, 3rd, and 4th Business Normal Form, Identifying Current and Future Business Needs, Capturing Expert Business Knowledge. [TB: Ch. 9] [page no 275-326]
13. Menu Design, Screen Design, Performance Analysis, and Process Modeling: EA Incremental Build Context, Initial Menu Structure from a Data Model, Preliminary Screen Designs from a Data Model, Database Capacity Planning and Transaction Performance, Prototyping from a Data Model, Process Modeling. [TB: Ch. 10] [page no 329-361]
14. Service-Oriented Architecture for Integration: Importance of Service-Oriented Architecture, Introduction to Service-Oriented and Event-Driven Architectures, SOA Business Process Management Products. [TB: Ch. 14] [page no 435-454]
15. Mid-term
16. Final-term

COURSE SCHEDULE

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| --- | --- | --- |
| Week  | Topics and Readings  | Dates  |
| 1. | Overview of devops – basic principles and philosophies. [TB: Ch. 1] [page no 1-16] | 13 jan, 202017 jan, 2020 |
| 2. | The role of the cloud – features of the cloud [TB: Ch. 2] [page no 23-37] | 20 jan, 202024 jan, 2020 |
| 3. | Operations services and continual improvement [TB: Ch. 3] [page no 41-69] | 27 jan, 202031 jan, 2020 |
| 4. | System architecture for devops with micro services. [TB: Ch. 4] [page no 73-87] | 3 feb, 20207 feb, 2020 |
| 5. | Building and testing software and systems. [TB: Ch. 5] [page no 93-138] | 10 feb, 202014 feb, 2020 |
| 6. | Deployment of software and systems. [TB:Ch. 6] [page no 93-138] | 17 feb, 202021 feb, 2020 |
| 7. | Monitoring and interpreting monitor data.[TB: Ch. 7] [page no 195-237] | 24 feb, 202028 feb, 2020 |
| 8. | Mid Term  | 02, March, 202006 March, 2020 |
| 9. | Important measures for quantifying software and systems [TB: Ch. 8] [page no 243-271] | 09, March, 202013 March, 2020 |
| 10. | Business considerations including compliance. [TB: Ch. 9] [page no 275-320] | 16, March, 202020 March, 2020 |
| 11. | Future directions of devops [TB: Ch. 14] [page no 435-454] | 23, March, 202027 March, 2020 |
| 12. | Strategic Alignment, Activity and Workflow Modeling, and Business Rules: EA Incremental Build Context, Define Strategic Alignment Matrices, Activity Modeling Concepts, Activity-Based Costing, Workflow Modeling, Business Rules for Workflow Modeling. [TB: Ch. 8] [page no 243-271] | 30 March, 202003 April, 2020 |
| 13. | Using Business Normalization for Future Business Needs:EA Incremental Build Context, Introduction to Normalization, 1st, 2nd, 3rd, and 4th Business Normal Form, Identifying Current and Future Business Needs, Capturing Expert Business Knowledge. [TB: Ch. 9] [page no 275-326] | 06April,202010 April, 2020 |
| 14. | Menu Design, Screen Design, Performance Analysis, and Process Modeling: EA Incremental Build Context, Initial Menu Structure from a Data Model, Preliminary Screen Designs from a Data Model, Database Capacity Planning and Transaction Performance, Prototyping from a Data Model, Process Modeling. [TB: Ch. 10] [page no 329-361] | 13April,202017 April, 2020 |
| 15. | Service-Oriented Architecture for Integration: Importance of Service-Oriented Architecture, Introduction to Service-Oriented and Event-Driven Architectures, SOA Business Process Management Products. [TB: Ch. 14] [page no 435-454] | 20April,202001May, 2020 |
| 16. | Summary and review | 4 May,20208 May, 2020 |

**Student Learning Outcomes**

At the successful completion of the course, students will be able to demonstrate attainment of the course objectives by:

1. Completing a requirements gathering and modeling exercise for a typical IT project
2. Describing how systems architecture directly affects the system lifecycle
3. Writing a report describing build/buy trade‐offs for a service needed for a typical IT project
4. Cataloging the components of usability testing for a service for a typical IT project
5. Describing the components and interfaces of systems integration for a typical IT project
6. Creating and documenting a devops plan for a typical IT project

ASSIGNMENTS

1. **First Assignment**

Provide detailed description of systems integration problem for a specific organization. Integration problem and organization can be real or fictitious. The integration problem should be complex enough to warrant utilization of advanced service integration technologies. The problem must involve more than three applications and five interactions among them.**(21 Feb,** 2020**)**

1. **Second assignment**

Develop a Balance Scorecard into a strategy Map of a case study of your choice.**(15 March,** 2020**)**

1. **Third assignment**

Provide detailed design solution and implementation plan for the identified systems integration problem. Discuss assumptions made to analyze the problem and design the solution. Justify your assumptions, design decisions, and solutions adopted. Justify why you made such decisions and why they make sense. Provide detailed plan to implement designed solution along with details of service-oriented frameworks, platforms, servers, orchestration engines, etc. Discuss the feasibility of the implementation plan. Provide recommended products that will be used for the implementation. Provide comparative feature set evaluation of similar products to justify your selection. Discuss shortcomings of the solution developed and how it could be improved. **(18 April,** 2020**)**

1. **Fourth assignment**

Write the Quality of Planning Statement of an Organization and also analyze the strategy of organization using nine step of strategy analysis. **(24 April,** 2020**)**

1. Quizzes (19 feb, 2019)
2. One Surprised quiz.

RESEARCH PROJECT

Tool: Endrew Max

Draw the data map of online shopping system. Data map can be drawn by using activity model, work flow model, context model and node diagram…..merging these model build a complete data model in Endrew Max.

**(Date of evaluation: 1 MAY,** 2020**)**

ASSESSMENT CRITERIA

Sessional: 20

Midterm: 30

Final exam: 50

RULES AND REGULATIONS

* **Class Attendance and Absenteeism**

Students are required to attend all classes and lab meetings. Regular attendance in their class/laboratory sessions will be very helpful to maintain a satisfactory progress throughout their course. Attendance will be strictly enforced and evaluated according to the Student Attendance Control Criteria announced by the DOCSIT and UoS. Any student who exceeds the maximum allowable absence limit during the course will not be allowed to sit in the exams. The maximum allowed limit for this course is 25% which include both excused and unexcused absences.

* **Policy on Late Lab. / Project Report and Written Work =============**

Assignments are due at the beginning of the class on the date indicated in the course schedule or on the assignment.  If the due date is extended, you will be informed of this through notice board. Assignments will not be accepted after the classroom discussion occurs. Such discussion would provide an unfair advantage to those who are preparing/submitting the assignment after the fact. At the instructor's option, late assignments may be evaluated to provide feedback, but WILL NOT BE GRADED. Late assignments will receive a grade of zero.

* **Academic Integrity**

Cheating in any form will not be tolerated and could lead to severe consequences. Academic work submitted by the students in the form of homework, assignment, or a project must be the result of their own effort.

* **Make-Up Exam Policy**

A student who has missed an exam will be allowed to sit in a make-up exam only if he or she provides a medical report from a government hospital/clinic.

* **General Behavior**

Students must maintain a good behavior both in and outside their classes. They are required to keep their mobile phones switched off while attending their class/laboratory sessions or writing their exams. Any student who engages in a behavior that disrupts the learning environment may face disciplinary action under the UoS code. Students must also maintain a smoke free environment in all college facilities.