Subject Description Form

Subject Code	COMP4442
Subject Title	Service and Cloud Computing
Credit Value	3
Level	4
Pre-requisite / Co-requisite / Exclusion	**Pre-requisite**: COMP2322
Objectives	The objectives of this subject are to: • provide students with a broad view of the theoretical and technological aspects that has led to the evolution of service and cloud computing; • equip students with the knowledge and understanding of the technical underpinnings, supporting technologies and best practices to successfully design, implement and deploy service and cloud computing in enterprises; and • equip students with the necessary skills to critically evaluate existing IT system and infrastructure, and to objectively assess the benefits of service and cloud-oriented computing architecture for enterprise.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: *Professional/academic knowledge and skills* (a) understand and appreciate the technological impact of service and cloud computing for future enterprises, and the technologies underpinning it; (b) apply systematic and principled practices to designing, implementing and deploying service and cloud-oriented computing; and (c) review and assess the risks, opportunities, costs and steps towards migrating existing systems to service and cloud computing. *Attributes for all-roundedness* (d) systematic and incremental approach to resolving practical enterprise computing problems and challenges; (e) learn to work effectively as a team member; and (f) write technical reports and present solutions.

Subject Synopsis/ Indicative Syllabus	**Topic** **1. Service-Oriented Architecture** The evolution of computing, from functional, to object, to component and to service-oriented; benefits of Service abstraction; Software as a service (SaaS); Software-Oriented distribution; Web services fundamentals; Service composition. **2. Service Computing** Core technology underpinning Service Computing; XML; Web Services solutions; WSDL Service Description; SOAP Messaging; Service Discovery; Enterprise Application Integration and the role of Web Services; other Middleware approaches; Services co-ordination and composition. **3. Cloud Computing** SOA meets Cloud Computing. Definition of Cloud and its relation to Service Computing. Components of Cloud Computing. Benefits and drawbacks. Clouds for the Enterprise; Storage-as-a-Service; Database-as-a-Service; Application-as-a-Service; Integration-as-a Service and etc. **4. Building SOA** SOA delivery life cycle; Service-oriented analysis, design, development and testing. Top-down strategy; Bottom-up strategy; Agile Strategy. Case studies.
Teaching/ Learning Methodology	The course is comprised of lectures, tutorials and laboratory exercises. During lectures, students are taught the important concepts and principles that drive the development of service computing, and how it connects to cloud. In the lecture, students are encouraged to actively participate in mini-discussions and questions that are designed to reinforce their understanding of concepts taught. During tutorials, students will be presented with real and practical scenarios of enterprise case studies. In particular, they will be given the unique opportunities to study, analyze and propose solutions that leverage service and cloud computing concepts. Small group discussions will be encouraged and students will need to present their results and solutions in the form of reports and presentations. To reinforce practical aspects of their training, simple lab exercises will be conducted to expose students to the state-of-the-art tools and development environment that uses service and cloud computing as the underlying architecture to provide enterprise solutions.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	f
1. Continuous Assessments	**55%**	✓	✓	✓	✓	✓	✓
2. Final Examination	**45%**	✓	✓	✓	✓		
Total	100%						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Students taking the subject will be assessed by participation in mini discussions and Q&A, assignments, group projects and tests. The mini-discussions during tutorials engage students to actively participate in group discussions. Students are to collaboratively work together to apply what they have learned in the class to solve practical problems. Assignments are designed to help students reinforced their understanding of concepts and principles that are taught in the class. Group projects are designed to help students to work together in a small group to solve practical case studies and examples by applying concepts that are taught in the class. The results are to be presented in the form of reports and presentations to the class. Students in peer groups are encouraged to raise questions and challenge solutions that are proposed in other groups. Quizzes will also be conducted to assess independent problem solving and critical thinking skills.

Student Study Effort Expected

Class contact:	
▪ Lectures	39 Hrs.
▪ Tutorials/Lab	0 Hrs.
Other student study effort:	
▪ Assignments, Projects, Reading and Exam	66 Hrs.
Total student study effort	105 Hrs.

Reading List and References

Reference Books:

1. V. K. Cody Bumgardner, *OpenStack in Action*, 1st Edition, Manning Publications, 2016.
2. Kevin Jackson, *OpenStack Cloud Computing Cookbook*, 3rd Edition, PACKT Publishing, 2015.
3. Thomas Erl, Ricardo Puttini and Zaigham Mahmood, *Cloud Computing: Concepts, Technology and Architecture*, Prentice Hall, 2013.
4. Gautam Shroff, *Enterprise Cloud Computing*, Cambridge University Press, 2010.

	5. David S. Linthicum, *Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide*, Addison-Wesley, 2009. 6. John Rhoton, *Cloud Computing Explained: Implementation Handbook for Enterprises*, Recursive Press, 2009.