Subject Description Form

Subject Code	COMP 3432
Subject Title	Innovative Computing Paradigms
Credit Value	3
Level	3
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisites: COMP 2011, COMP 2021
Objectives	The objectives of this subject are to: 1. To introduce students to the principles of innovative computing paradigms. 2. To give students practice in developing applications for innovative computing paradigms. 3. To cultivate students' problem-solving skills.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: Professional/academic knowledge and skills (a) Understand the basic principles of innovative computing paradigms that provide solutions to enable human-centric interaction and integration to computation that is adaptive and responsive to contextual changes. (b) Understand the fundamental paradigm shift that has impacted various aspects of computing towards architectural solutions that promote adaptable and coordinated computing; (c) Understand and appreciate the role of context-aware computing and the programming for the physical environment; (d) Understand the basic principles of contextual sensing, ubiquitous design, mobile data management and the important role that middleware plays in coordinated processing; (e) Understand and appreciate the different applications in different emerging computing paradigms Attributes for all-roundedness (f) develop skills in problem solving using systematic approaches; (g) identify and develop problem solutions in a logical manner; (h) solve complex problems in groups and develop group work.
Subject Synopsis/ Indicative Syllabus	1. Linking the physical world to the digital domain; 2. Ubiquitous networking; backbone infrastructure support; local mobility interaction; micro and macro mobility. 3. Ubiquitous sensing paradigms; mapping sensing to event notifications 4. Emerging computing paradigms that integrate contextual adaptation to human-centric computation. 5. Pervasive and Ubiquitous Computing. Smart objects. Smart/context-aware environments. 6. Human-Centered Interfaces and service-oriented architecture. Multimodal and tangible input/output. 7. Mobile and Wearable Computing. Wireless infrastructures.

	Context-aware Computing. 8. Middleware for adaptive and reflective computing.
Teaching/Learning Methodology	During the lectures, students will be taught the basic principles of innovative computing paradigms. Whenever possible, to reinforce students understanding of the concepts taught, practical examples and study will be introduced. During tutorial, students will be required to solve problems and questions pertaining to various computing paradigms that promote human centric interaction and computation. Lab sessions will be setup to teach students to use software and tools related to materials taught in the class. In addition to quizzes and individual assignments to train students on their independent problem solving skills, group projects will be set to allow students to work in as a group.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed							
		a	b	c	d	e	f	g	h
Assignments, Tests & Projects	55	x	x	x	x	x	x	x	x
Final Examination	45	x	x	x	x	x	x	x	
Total	100								

Student study effort expected

Class Contact:	
Lecture	39 hours
Tutorial/Lab	0 hours
Other student study effort:	
Assignments, Quizzes, Projects, Exams	66 hours
Total student study effort	**105 hours**

Reading list and references

(1) Malcolm McCullough. Digital Ground: Architecture, Pervasive Computing, and Environmental Knowing. The MIT Press; New edition edition (October 1, 2005)

(2) Adam Greenfield. Everyware: The Dawning Age of Ubiquitous Computing. New Riders Publishing; 1st edition (March 20, 2006)

(3) Dragan Stojanovic. Context-Aware Mobile and Ubiquitous Computing for Enhanced Usability: Adaptive Technologies and Applications; Information Science Reference (Mar 20, 2009)

(4) Stefan Poslad. Ubiquitous Computing: Smart Devices, Environments and Interactions; Wiley; 1 edition (May 19, 2009)