Subject Description Form

Subject Code	COMP276
Subject Title	Computer Appreciation and Application
Credit Value	3
Level	2
Pre-requisite / Co-requisite/ Exclusion	Pre-requisite/Co-requisite/ Exclusion: Nil
Objectives	This subject aims at teaching students: • understanding of computer systems; • problem solving skills using computers; • programming using a high level programming language; • using software packages for solving engineering problems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: *Professional/academic knowledge and skills* (a) be appreciative of the role of computer in a practical problem solving context; (b) recognize the main elements of computer systems and the interactions of problem solving and programming; (c) write structured and modular programs using a high level programming language for solving engineering problems; (d) use and have hands-on experience in some useful software packages for solving engineering problems. *Attributes for all-roundedness* (e) follow the evolving trends in computing and information technology, and their practical applications; (f) be appreciative of the power of information technology in obtaining and presenting information; (g) be appreciative of the need to keep abreast of the rapid developments in different branches of civil engineering.

Subject Synopsis/ Indicative Syllabus

Topic	Duration of Lectures
1. Elementary computer concepts Main units of computer systems; commonly used peripheral devices; application of computer software and hardware systems	1
2. Programming using a high-level programming language: Fortran 90 Fundamental programming concepts; computer languages and program compilation; basic data types; expressions; control structures; input/output, file processing; arrays and matrices computation; program modules and structured programming; algorithms; problem analysis.	10
3. Using spreadsheets and databases Concept of spreadsheets: Excel; handy computation and graph plotting; concept of databases: Access; data manipulation, information systems.	3
4. Using Matlab Numerical computation; matrix manipulation; Matlab commands; Matlab toolbox; Matlab graphics.	4
5. Networking and Internetworking Basic networking concepts; ARPANET and Internet, domain and IP address; file transfer, remote computing, client/server concepts	3
Total	**21**

Teaching/Learning Methodology

The subject involves 21 hours of lecture and 21 hours of tutorial/laboratory sessions. Lectures cover the conceptual materials and fundamentals in computing areas. The tutorial/laboratory sessions are used for:

- interactive tutoring for application of computer fundamentals and programming with the use of web materials and guided reading.
- hands-on laboratory sessions for program writing and the use of application software.

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	g
1. Assignments	0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2. Lab tasks and exercises	50%	✓	✓	✓	✓	✓	✓	N/A
3. Project	0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4. Mid-term	0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5. Final Test	50%	✓	✓	✓	✓	✓	✓	N/A
Total	100 %							

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

Lab tasks and exercises will provide opportunity for students to try out and realize the concepts and theories learnt in lectures during the laboratory sessions. Tasks and exercises for progamming using a high level programming language and using software package and tools have been given to achieve the intended goals (a) to (f).

Final test will provide an individual assessment within limited time to students. Final test given covers all the topics taught in both lectures and laboratories. Questions on both theories, practical knowledge and their application as well as problem solving is given in the Final Test.

Student Study Effort Required

Class contact:	
▪ Lectures	21 Hrs.
▪ Laboratory sessions	21 Hrs.
Other student study effort:	
▪ Reading lecture notes, reference books and other relevant materials	21 Hrs.
▪ Tasks and Exercises	42 Hrs.
Total student study effort	105 Hrs.

Reading List and References

Reference books:

1. Shelly, G.B., Cashman, T.J. and Vermaat, M.E., *Discovering Computers 2007: A Gateway to Information: Web Enhanced – Complete*, Thomson Course Technology, 2007.
2. Holloway, J.P., *Introduction to Engineering Programming: Solving Problems with Algorithms*, John Wiley & Sons, 2004.
3. Nyhoff, L.R. and Leestma, S., *Fortran 90 for Engineers and Scientists*, Prentice-Hall, 1997.
4. Austin, M. and Chancogne, D., *Introduction to Engineering Programming: in C, Matlab and Java*, John Wiley & Sons, 1999.
5. Biran, A., *MATLAB 5 for Engineers*. 2nd Edition, Addison-Wesley, 1999.