# PAAVAI ENGINEERING COLLEGE, NAMAKKAL – 637 018 (AUTONOMOUS)

# DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

# **REGULATIONS 2015**

# CURRICULUM AND SYLLABUS III – IV SEMESTER



M.C.A.Programme

(3 Years Duration)

# PAAVAI ENGINEERING COLLEGE

# (Autonomous)

# Vision

To strive to be a globally model Institution all set for taking 'lead-role' in grooming the younger generation socially responsible and professionally competent to face the challenges ahead.

# Mission

- To provide goal- oriented, quality based and value added education through state of – the – art technology on a par with international standards.
- To promote nation building activities in science, technology, humanities and management through research
- To create and sustain a community of learning that sticks on to social, ethical, ecological, cultural and economic upliftment.

# PAAVAI ENGINEERING COLLEGE

# (Autonomous)

# DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

# Vision

To strive to be globally model institutions all set for taking lead role in grooming the younger generation socially responsible and professionally competent to face the challenges ahead

# Mission

- To upgrade the academic activities by continuous improvement in the teaching learning process with value based education.
- To enhance social responsibilities of the students necessary for successful practice of the profession.
- To facilitate research and industrial interaction.
- To mould the students into competent and creative technocrats to meet the growing global changes and challenges.
- To encourage the students as entrepreneurs and leaders of the society for the betterment of the Country.

	Programme Educational Objectives (PEOs)					
	Master of Computer Applications Graduates will be able to :					
PEO1	Global Reputation	To create value added, disciplined high profile Master of Computer Applications professionals for successful careers in their related industry that makes them globally reputed.				
PEO2	Fundamental Knowledge	To develop the students with a sound foundation in mathematical, scientific and engineering fundamentals necessary to synthesize the technical core concepts focusing on skill development and knowledge up gradation which will lead to technical innovations.				
PEO3	Continuous Learning	To practice and demonstrate the ability to use the domain knowledge and expertise through periodic assignments, performances and projects to continuously prove the functionality of Master of computer applications learning in social environmental aspects and to make allowances for further improvements.				

	Programme Outcomes (POs)						
	Master of Computer Applications Graduates will be able to :						
PO1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.					
PO2	Problem Analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.					
PO3	Design/Development of Solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.					
PO4Conduct investigations of complex problemsUse research-based knowledge and research methods includi design of experiments, analysis and interpretation of data, a synthesis of the information to provide valid conclusions.							
PO5	Modern Tool Usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.					

PO6	The engineer and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice		
PO7	Environment and sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.		
PO8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.		
PO9	Individual and team work	m Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.		
PO10	Communications	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.		
PO11	Project management and finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments		
PO12	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.		

	Programme Specific Outcomes (PSOs)					
PSO1	Core Competencies:	Students attain deep domain knowledge in the fields of basic science to engineering applications and to enhance linguistic skills for effective communication and an ability to use conceptual knowledge of Surveying, fluid mechanics, hydrology and water resources and identify the environmental issues to propose suitable solutions.				
PSO2	Creativity and Design:	Students gain profound knowledge in the area of Planning, analyzing, design and estimation of civil engineering structures with professional ethics and managerial skills for economic design and suggests suitable materials and techniques for construction and rehabilitation works.				

# PAAVAI ENGINEERING COLLEGE, NAMAKKAL – 637 018 (AUTONOMOUS) MASTER OF COMPUTER APPLICATIONS REGULATIONS 2015 CURRICULUM

# SEMESTER I

Course	Course Title	L	Т	Р	С
PMA15108	Mathematical Foundation for Computer Applications	3	2	0	4
CA15101	Computer Organization	3	0	0	3
CA15102	Problem Solving Techniques	3	0	0	3
CA15103	Programming in C	3	0	0	3
CA15104	Data structures and Algorithms	3	0	0	3
CA15105	Programming in C Laboratory	0	0	4	2
CA15106	Data Structures and Algorithms Laboratory	0	0	4	2
CA15107	Office Automation Laboratory	0	0	4	2
	Total	15	2	12	22

# SEMESTER II

Course	Course Title	L	Т	Р	С
CA15201	Object Oriented Programming	3	0	0	3
CA15202	Database Management Systems	3	0	0	3
CA15203	System Software	3	0	0	3
CA15204	Operating Systems	3	0	0	3
CA15205	Computer Graphics and Multimedia	3	0	0	3
CA15206	Object Oriented Programming Laboratory	0	0	4	2
CA15207	DBMS Laboratory	0	0	4	2
CA15208	Graphics and Multimedia Laboratory	0	0	4	2
	Total	15	0	12	21

# SEMESTER III

Course	Course Title	L	Т	Р	С
PMA15301	Resource Management Techniques	3	2	0	4
CA15301	Computer Communication Networks	3	0	0	3
CA15302	Object Oriented Analysis and Design	3	0	0	3
CA15303	Software Engineering	3	0	0	3
CA15304	Web Programming	3	0	0	3
CA15405	Software Development- Case Tools Laboratory	0	0	4	2
CA15306	Web Programming Laboratory	0	0	4	2
PEN15201	Communication and Soft Skills Laboratory	0	0	2	1
	Total	15	2	10	21

# SEMESTER IV

Course	Course Title	L	Т	Р	С
CA15401	C# and .NET Framework	3	0	0	3
CA15402	Free Open Source Software	3	0	0	3
CA15403	Data Mining and Data Warehousing	3	0	0	3
CA15404	Big Data Analytics	3	0	0	3
CAE15***	Elective I	3	0	0	3
CA15405	Free Open Source Software Laboratory	0	0	4	2
CA15406	C# and .NET Programming Laboratory	0	0	4	2
CA15407	Technical Seminar and Report Writing	0	0	4	2
PCA15408	Career Development Laboratory	0	0	2	1
	Total	15	0	14	22

# SEMESTER V

Course	Course Title	L	Т	Р	С
CA15501	Web Application Development	3	0	0	3
CA15502	Software Project Management	3	0	0	3
CA15503	Mobile Computing	3	0	0	3
CAE15***	Elective II	3	0	0	3
CAE15***	Elective III	3	0	0	3
CA15504	Advanced Internet Programming Laboratory	0	0	4	2
CA15505	XML and Web Services Laboratory	0	0	4	2
CA15506	Mini Project (Socially Relevant)	0	0	4	2
	Total	15	0	12	21

# SEMESTER VI

Course	Course Title	L	Т	Р	С
CA15601	Project Work	0	0	24	12

**TOTAL CREDITS : 119** 

# LIST OF ELECTIVES

# **ELECTIVE I**

Course	Course Title	L	Т	Р	С
CAE15401	Energy Aware Computing	3	0	0	3
CAE15402	Information Security	3	0	0	3
CAE15403	Distributed Computing	3	0	0	3
CAE15404	Enterprise Application Integration	3	0	0	3
CAE15405	Game Programming	3	0	0	3
CAE15406	Soft Computing	3	0	0	3

# **ELECTIVE II**

Course	Course Title	L	Т	Р	С
CAE15501	Network Protocols	3	0	0	3
CAE15502	High Performance Computing	3	0	0	3
CAE15503	Cloud Computing	3	0	0	3
CAE15504	Green Computing	3	0	0	3
CAE15505	Software Testing and Quality Assurance	3	0	0	3
CAE15506	Ad hoc and Sensor Networks	3	0	0	3

# **ELECTIVE III**

Course	Course Title	L	Т	Р	С
CAE15507	Internet of Things	3	0	0	3
CAE15508	M-Commerce	3	0	0	3
CAE15509	Health Care Management	3	0	0	3
CAE15510	Geological Information Systems	3	0	0	3
CAE15511	Human Resource Management	3	0	0	3
CAE15512	Semantic web	3	0	0	3

#### **RESOURCE MANAGEMENT TECHNIQUES**

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#### **COURSE OBJECTIVES**

To enable the students to

- provide the concept and an understanding of basic concepts in Operations Research
- understand the Techniques for Analysis and Modeling in Computer Applications
- understand, develop and solve mathematical model of linear programming problems
- understand, develop and solve mathematical model of Transport and assignment problems
- understand network modeling for planning and scheduling the project activities

#### UNIT I LINEAR PROGRAMMING MODELS

Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques- Variants of Simplex method

#### UNIT II TRANSPORTATION AND ASSIGNMENT MODELS

Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution- optimum solution - degeneracy – Mathematical formulation of assignment models – Hungarian Algorithm –Variants of the Assignment problem

# UNIT III INTEGER PROGRAMMING MODELS 15

Formulation - Gomory's IPP method - Gomory's mixed integer method - Branch and Bound technique.

# UNIT IV SCHEDULING BY PERT AND CPM

Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling

#### UNIT V QUEUEING MODELS

Characteristics of Queuing Models – Poisson Queues - (M / M / 1) : (FIFO /  $\infty / \infty$ ), (M / M / 1) : (FIFO/ N /  $\infty$ ), (M / M / C) : (FIFO /  $\infty / \infty$ ), (M / M / C) : (FIFO / N /  $\infty$ ) models.

## TOTAL PERIODS 75

#### **COURSE OUTCOMES**

At the end of the course the students would be able to

- understand and apply linear, integer programming to solve operational problem with constraints
- apply transportation and assignment models to find optimal solution in warehousing
- prepare project scheduling using PERT and CPM
- identify and analyze appropriate queuing model to reduce the waiting time in queue
- use optimization concepts in real world problems

# REFERENCES

1. Taha H.A., "Operations Research : An Introduction" 8th Edition, Pearson Education, 2011.

2. A.M.Natarajan, P.Balasubramani, A.Tamilarasi, "Operations Research", Pearson Education, Asia, 2013.

3. Prem Kumar Gupta, D.S. Hira, "Operations Research", S.Chand & Company Ltd, New Delhi, 3<sup>rd</sup>Edition, 2013.

4. John W. Chinneck "Feasibility and Infeasibility in Optimization Algorithms and Computational Methods'

5. Ravindran, Phillips, Solberg, "Operations Research: Principles And Practice", 2ndEdition, JohnWiley& Sons, 01-Jul-2012

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CO1	2	2	3	2	-	-	-	-	-	-	-	1	2	2
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2
CO3	2	2	3	2	3	-	-	-	-		2	1	1	3
CO4	2	2	2	2	-	-	-	2	-	-	-	-	2	2
CO5	1	2	3	1	-	-	-	1	-	-	-	3	2	3



Springer, 2013

#### **COURSE OBJECTIVES**

To enable the students to

- understand networking concepts and basic communication model
- understand network architectures and components required for data communication
- analyze the function and design strategy of physical, data link, network layer and transport layer
- acquire knowledge of various application protocol standard developed for internet
- analyze the trace for the flow of information from one node to another node in the network

## UNIT I INTRODUCTION

Data Communications – Networks – Protocols and Standards. Network Models – OSI Model – Layers– TCP/IP Protocol Suite–Addressing. Digital Transmission – Digital-to-Digital Conversion – Analog-to-Digital Conversion– Transmission Modes. Analog Transmission – Digital-to-Analog Conversion – Analog-to-analog Conversion. Transmission Media – Guided and Unguided Media.

# UNIT II DATA LINK LAYER

Error – detection and correction – Parity – LRC – CRC – Hamming code – Flow Control and Error control – stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - IEEE 802.4 - IEEE 802.5IEEE 802.11 – FDDI - SONET – Bridges.

## UNIT III NETWORK LAYER

Internetworks–Circuit Switching- Packet Switching and Datagram approach – IP addressing methods– Subnetting– Routing – Distance Vector Routing – Link State Routing – BGP -Routers.

# UNIT IV TRANSPORT LAYER

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP)– Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

## UNIT V APPLICATIONS

Domain Name Space (DNS) - SMTP - FTP - HTTP - WWW - Security - Cryptography.

#### TOTAL PERIODS 45

#### **COURSE OUTCOMES**

At the end of the course the students would be able to

- identify the components required to build different types of networks
- understand the functionalities needed for data communication into layers
- choose the required functionality at each layer for given application
- understand the working principles of various application protocols
- acquire knowledge about security issues and services available

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# REFERENCES

1 Larry L. Peterson & Bruce S. Davie, "Computer Networks – A systems Approach", FourthEdition, Harcourt Asia / Morgan Kaufmann, 2013.

2. William Stallings, "Data and Computer Communications", Ninth Edition, Prentice Hall, 2013.

3. Forouzan, "Data Communication and Networking", Fifth Edition, TMH 2013

4. Andrew S. Tannenbaum David J. Wetherall, "Computer Networks" Fifth Edition, Pearson Education 2013

5.James F. Kurose, Keith W. Ross, "Computer Networking: A Top-down Approach, Pearson Education, Limited, sixth edition, 2013

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		(1	/2/3 indi	icates st	rength	of corre	lation)	3-Stron	g, 2-Me	edium, 1	l-Week				
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CO2	2       2       3       2       -       -       -       -       -       1       2       2         1       2       2       2       3       -       -       -       -       1       2       2       2         1       2       2       3       -       -       -       -       2       1       2														
CO3	2	2	3	2	3	-	-	-	-		2	1	1	3	
CO4	2	1	2	3	-	-	-	2	-	-	-	-	2	2	
CO5	1	2	3	2	-	-	-	2	-	-	-	3	2	3	



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#### **COURSE OBJECTIVES**

To enable the students to

- understand the basic concept of OOPs concept
- provide a brief, hands-on overview of object-oriented analysis in software process
- discuss Case studies based project specifications to develop object-oriented models and identify implementation strategies
- demonstrate and apply basic object oriented techniques to create and modify object oriented analysis
- understand and apply testing techniques for object oriented software

#### UNIT I INTRODUCTION

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding– Class hierarchy – Relationships – Associations – Aggregations- Identity – Dynamic binding – Persistence – Meta classes – Object oriented system development life cycle.

# UNIT II METHODOLOGY AND UML

Introduction– Survey – Rumbugh, Booch, Jacobson methods – Patterns – Creational - Abstract Factory – Factory Method – Behavioral – Momento – Mediator - Structural – Decorator - Facade – Concurrency Patterns–Lock– Reactor–Scheduler- Frameworks – Unified approach – Unified modeling language – Staticand Dynamic models– UML diagrams– Class diagram – Usecase diagrams – Dynamic modeling – Model organization – Extensibility.

# UNIT III OBJECT ORIENTED ANALYSIS

Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecase model – Documentation – Classification – Identifying object, relationships, attributes, methods – Super-sub class – A part of relationships Identifying attributes and methods – Object responsibility

### UNIT IV OBJECT ORIENTED DESIGN

Design process and benchmarking – Axioms – Corollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer Interface-OOUI - MVC Architectural Pattern and Design – Designing the system.

#### UNIT V QUALITY AND TESTING

Quality assurance – Testing strategies – Test cases – Automated Testing Tools – Case Study - Cryptanalysis– Health Care Systems- Inventory Control System - Rational Rose Suite.

#### TOTAL PERIODS 45

At the end of the course the students would be able to

- understand the basic concepts to identify state & behavior of real world objects
- able to learn the various object oriented methodologies and choose the appropriate one for solving the problem with the help of various case studies
- understand the concept of analysis, design & testing to develop a document for the project
- able to implement analysis, design & testing phases in developing a software project
- able to understand the testing strategies and know about automated testing tools

# REFERENCES

1. Taha H.A., "Operations Research : An Introduction" 8th Edition, Pearson Education, 2011.

2. Craig Larman, Applying UML and Patterns, 2<sup>nd</sup> Edition, Pearson, 2013.

3.Brahma Dathan, Sarnath Ramnath, "Object-Oriented Analysis, Design and Implementation", Universities Press 2013.

4.Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Addison Wesley Long man, 2013

5.Bernd Bruegge, Allen H. Dutoit, Object Oriented Software Engineering using UML, Patterns and Java, Pearson 2012

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COs		(1,	/2/3 ind	icates st	rength	<u>of corre</u> Progra	lation) : mme O	<u>3-Stron</u> utcome	<u>g, 2-Me</u> s (POs)	dium, 1	l-Week				
CO	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         2           2         2         3         2         5         5         5         5         5         5         7         5         7 </th														
CO1	2	2	3	2	-	-	-	-	-	-	-	1	2	2	
CO2	2	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO3	2	2	3	2	3	-	-	-	-		3	1	2	3	
CO4	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO5	1	2	3	1	2	-	-	1	-	-	-	3	1	2	



#### SOFTWARE ENGINEERING

## **COURSE OBJECTIVES**

To enable the students to

- understand the software life cycle
- provide an insight into the processes of software development
- understand and practice the various fields such as analysis, design, development testing
- understand the software metrics
- apply metrics and testing techniques to evaluate the software

# UNIT I INTRODUCTION

Software Engineering paradigms – Waterfall Life cycle model –Spiral Model – Prototype Model – fourth Generation Techniques–Planning – Software Project Scheduling – Risk analysis and management –Requirements and Specification – Case Study for Project Plan and SRS

# UNIT II SOFTWARE DESIGN

Abstraction–Modularity–Software Architecture – Cohesion – Coupling – Various Design Concepts and notations– Real time and Distributed System Design – Documentation – Dataflow Oriented design – Jackson System development – Designing for reuse – Programming standards – Case Study for Design of anyApplication Project.

#### UNIT III SOFTWARE TESTING AND MAINTENANCE

Software Testing Fundamentals – Software testing strategies – Black Box Testing – White Box Testing – System Testing – Object Orientation Testing – State based Testing - Testing Tools – Test Case Management –Software Maintenance Organization – Maintenance Report – Types of Maintenance – Case Study for Testing Techniques

#### UNIT IV SOFTWARE METRICS

Scope – Classification of metrics – Measuring Process and Product attributes – Direct and Indirect measures – Cost Estimation - Reliability – Software Quality Assurance – Standards – Case Study for COCOMO model

#### UNIT V SCM & WEB ENGINEERING

Need for SCM–Version Control – SCM process – Software Configuration Items – Taxonomy –CASE Repository–Features – Web Engineering

# TOTAL PERIODS 45

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At the end of the course the students would be able to

- get an insight into the processes of software development
- able to understand the problem domain for developing SRS and various models of software engineering
- able to Model software projects into high level design using DFD,UML diagrams
- able to Measure the product and process performance using various metrics
- able to Evaluate the system with various testing techniques and strategies

# REFERENCES

- 1. Roger S. Pressman, "Software Engineering: A Practitioner Approach", Seventh edition, McGrawHill, 2013.
- 2. Richard Fairley, "Software Engineering Concepts", Tata McGraw Hill Edition, 2012
- 3. Ali Behforroz, Frederick J.Hudson, "Software Engineering Fundamentals", Oxford Indian Reprint, 2013
- 4. Sommerville, "Software Engineering", Sixth Edition, Addison Wesley-Longman, 2013.
- 5. Kassem A. Saleh, "Software Engineering", First Edition, J.Ross Publishing, 2012.

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CO1	101     102     103     103     103     103     103     103     103     10     11     12     1     2       2     2     3     2     -     -     -     -     -     1     2     2														
CO2	2	2	2	2	2	-	-	-	-	-	-	2	1	2	
CO3	2	2	2	2	2	-	-	-	-		3	1	2	3	
CO4	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO5	1	2	2	1	2	-	-	1	-	-	-	3	1	2	

Approved BOARD OF STUDIES Master of Computer Application

#### CA15304

#### WEB PROGRAMMING

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#### **COURSE OBJECTIVES**

To enable the students to

- understand the concepts and architecture of the World Wide Web
- understand and practice mark-up languages
- understand and practice embedded dynamic scripting on client side Internet Programming
- understand and practice of java concept
- understand and practice web development techniques on client-side

# UNIT I BASIC NETWORK AND WEB CONCEPT

Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML

# UNIT II MARKUP LANGUAGE

Introduction to HTML and HTML5-Formatting and Fonts-Commenting Code– Anchors – Backgrounds – Images– Hyperlinks – Lists – Tables – Frames - HTML Forms.

#### UNIT III STYLESHEET

The need for CSS, Introduction to CSS – Basic syntax and structure - Inline Styles – Embedding Style Sheets - Linking External Style Sheets – Backgrounds - Manipulating text - Margins and Padding -Positioning using CSS.

#### UNIT IV JAVAPROGRAMMING

Java features – Java Platform – Java Fundamentals – Expressions, Operators, and Control Structures –Classes, Packages and Interfaces – Exception Handling

## UNIT V PACKAGES

AWT package – Layouts – Containers – Event Package – Event Model – Painting – Garbage Collection– Multithreading – Language Packages.

# TOTAL PERIODS 45

#### **COURSE OUTCOMES**

At the end of the course the students would be able to

- acquire knowledge about functionalities of world wide web
- explore mark-up languages features and create interactive web pages using them
- learn and design Client side validation using scripting languages
- acquire knowledge about Open source JavaScript libraries
- able to design front end web page and connect to the back end databases.

# REFERENCES

1. Harvey & Paul Deitel& Associates, Harvey Deitel and Abbey Deitel, "Internet and World WideWeb – Howto Program", Fifth Edition, Pearson Education, 2013.

2. Achyut S Godbole and AtulKahate, "Web Technologies", Second Edition, Tata McGraw Hill, 2012

3. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, TataMcGraw Hill, 2013.

4. Deitel, Deitel and Nieto, "Internet and World Wide Web – How to program", Pearson EducationPublishers, 2013.

5. R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age InternationalPublishers, 2013

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CO1	2	2	3	2	-	-	-	-	-	-	-	1	2	2	
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO3	2	3	3	3	3	-	-	-	-		2	2	1	3	
CO4	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO5	2	2	3	2	-	-	-	1	-	-	-	2	2	2	

Approved BOARD OF STUDIES Master of Computer Application 4

# CA15305 SOFTWARE DEVELOPMENT – CASE TOOLS LABORATORY

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#### **COURSE OBJECTIVES**

To enable the students to

- understand and practice the various fields such as analysis, design, development testing of Software Engineering
- develop skills to construct software of high quality with high reliability
- 1. Practicing the different types of case tools such as Rational Rose / other Open Source to be used for all the phases of Software development life cycle.
- 2. Data modeling
- 3. Source code generators
- 4. Apply the following to typical application problems:
  - a. Project Planning
  - b. Software Requirement Analysis
  - c. Software Design
  - d. Data Modeling& Implementation
- 5. Software Estimation
- 6. Software Testing
- 7. A possible set of applications may be the following:
  - a. Library System
  - b. Student Marks Analyzing System
  - c. Text Editor.
  - d. Create a dictionary.
  - e. Telephone directory.
  - f. Inventory System.

TOTAL PERIODS 60

At the end of the course the students would be able to

- model software projects into high level design using DFD,UML diagrams
- measure the product and process performance using various metrics

			Ma (1/2/3 i	apping ndicate	of Cour s streng	ses Out th of co	comes v rrelatio	vith Pro n) 3-Stı	ogramm rong, 2-	e Outcoi Medium	mes: , 1-Week				
COs	Programme Outcomes (POs)														
СО	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO           PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         10         11         12         1         2														
CO1	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO2	1	2	3	1	-	-	-	1	-	-	-	3	2	3	

DING Approved BOARD OF STUDIES Master of Computer Application A

# CA15306

# WEB PROGRAMMING LABORATORY

## **COURSE OBJECTIVES**

To enable the students to

- understand and practice embedded dynamic scripting on client side Internet Programming
- understand and practice of java concept
- 1. Create a web page with the following using HTML5
  - a. To embed an image map in a web page
  - b. To fix the hot spots
  - c. Show all the related information when the hot spots are clicked.
- 2. Create a web page with all types of Cascading style sheets.
- 3. Writing Java programs by making use of class, interface, package, etc for the following
  - a. Different types of inheritance study
  - b. Uses of 'this' keyword
  - c. Polymorphism
  - d. Creation of user specific packages
  - e. Creation of jar files and using them
  - f. User specific exception handling

#### TOTAL PERIODS 60

At the end of the course the students would be able to

- explore mark-up languages features and create interactive web pages using them
- acquire knowledge about Open source JavaScript libraries

			M (1/2/3 i	apping ndicate	of Cour s streng	ses Out th of co	comes v rrelatio	vith Pro n) 3-Sti	ogramm rong, 2-	e Outcoi Medium	nes: , 1-Week					
COs	Programme Outcomes (POs)															
СО	PO1	PO1PO2PO3PO4PO5PO6PO7PO8PO9POPOPOPO0PSOPSO10111212														
CO1	2	2	2	2	-	-	-	2	-	-	-	-	2	2		
CO2	1	2	3	1	-	-	-	1	-	-	-	3	2	3		

Approved BOARD OF STUDIES Master of Computer Applications A

#### PEN15201 COMMUNICATION AND SOFT SKILLS LABORATORY

#### **COURSE OBJECTIVES**

To enable the students to

- develop the ability to communicate effectively in spoken English
- draft flawless resume in English and participate successfully in group discussions
- enhance their soft skills and interpersonal skill
- equip the learners to make effective presentations on topics in engineering and technology

#### UNIT I FORMAL & INFORMAL CONVERSATION PRACTICE

Role Play1- with family members, neighbours, friends, relatives etc. Simple Expressions – agreeing /disagreeing, persuading, wishing, consoling, advising, arguing, expressing opinions etc- Professional dialogues with the superiors-Conversation with different professionals- Situations like - Government and Corporate Offices, Official Meetings, Educational Institutions, (At the railway junction, malls, post office, bank) etc.

#### UNIT II ORAL REVIEW, RADIO SHOW & NARRATIVE TECHNIQUES

Oral review of movies and discussion or sharing the view on various concepts of the movie, Presentation of various radio programs like news, announcements, advertisements, entertainment programs etc. as a team activity, Understanding the basic narrative techniques-Narrating short stories with message, Narrating real life experiences.

#### UNIT III RÉSUMÉ / LETTER WRITING

Preparation of résumé-structure – use of words and language style – Types of letter – structure of a letter – format for writing letters – use of language in letters

#### UNIT IV RESENTATION SKILLS&GROUP DISCUSSION

Elements of effective presentation – Structure of presentation - Presentation tools – Voice modulation – effective use to presentation tools - Audience analysis - Body language – Video samples- Importance of GD – GD in selection process - Structure of GD – Moderator – led and other GDs - Strategies in GD – Team work – Body Language - Mock GD - Video samples

#### UNIT V INTERVIEW SKILLS

Kinds of interviews - Required Key Skills - Corporate culture - Mock interviews-Video samples.

At the end of the course the students would be able to

- speak effectively and confidently in English
- attend job interviews with confidence
- write effective job applications with resume.
- participate in GD with involvement and confidence.

#### TOTAL PERIODS 30

6

0 0 2 1

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# REFERENCES

1.Kalpana. V & Co., "Communication Skills Laboratory Manual", Vijay Nicole Imprints Pvt. Limited,

Chennai. 2013

2. Anderson, P.V. "Technical Communication", Thomson Edition, New Delhi, 2012.

3.Rizvi, Ashraf. M. Effective Technical Communication. Tata McGraw-Hill, New Delhi, 2012

4.Kumar Sanjay, PushpLata, "Communication Skills (With CD)", Oxford University Press, New Delhi. 2011

5.Dutt, Kiranmai P and GeethaRajeevan, "BasicCommunication Skills", Foundation Books, New Delhi. 2012.

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COs	s Programme Outcomes (POs)														
СО	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         2           Image:														
CO1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO														
CO2	-	-	-	3	3	-	2	2	3	-	-	-	-	-	
CO3	-	-	2	1	3	-	3	3	3	3	2	3	-	-	
CO4	-	-	-	2	-	-	-	3	3	3	3	-	-	-	



# CA15401

### **C# and .NET FRAMEWORK**

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#### **COURSE OBJECTIVES**

To enable the students to

- learn the .NET framework concept and understand the syntax of basic C# Programs
- learn C# elements and OOPS concepts
- learn fundamentals of window application programming and how to create a window application
- develop web-based applications and learn advanced features of C#
- understand the foundation of CLR execution

# UNIT I INTRODUCTION TO C#

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

## UNIT II OBJECT ORIENTED ASPECTS OF C#

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III APPLICATION DEVELOPMENT ON .NET 8

Building Windows Applications, Accessing Data with ADO.NET.

# UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET

Programming Web Applications with Web Forms, Programming Web Services.

### UNIT V THE CLR AND THE .NET FRAMEWORK

Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.

## TOTALPERIODS 45

#### **COURSE OUTCOMES**

At the end of the course the students would be able to

- use Visual Studio .NET to implementing the .NET application and to Know the basic C# elements
- know the C# OOPS Concepts
- know the basic ADO.NET structures and understand the ADO.NET database connectivity
- understand the ASP.NET Programming Model and able to create ASP pages for web applications
- understand the internal functions of CLR and develop Web based applications on .NET CLR

# REFERENCES

- 1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2014. (Unit I, II)
- 2. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2013. (Unit III, IV, V)
- 3. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2014.
- 4. Robinson et al, "Professional C#", 2nd ed., Wrox Press, 2013.
- 5. Andrew Troelsen, "C# and the .NET Platform", A1 Press, 2014.

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COs						Prog	ramme	Outcon	nes (POs	s)					
СО	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         2           -         -         -         -         2         2         3         3         1         3         1														
CO1	-	-	-	-	-	-	-	2	2	3	3	1	3	1	
CO2	-	-	-	2	3	-	1	2	-	3	3	1	2	2	
CO3	-	-	-	-	-	-	-	-	-	3	1	1	2	-	
CO4	-	-	-	-	3	1	1	-	2	3	3	1	3	2	
CO5	-	-	-	-	-	2	-	2	1	3	1	1	3	2	



### **COURSE OBJECTIVES**

To enable the students to

- know of how to do project for the open source software process
- learn the open source database during the analysis of the project
- understand the open source languages
- learn the basics of python concept
- understand the basics of Perl

## UNIT I INTRODUCTION

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources– Application of Open Sources Open source operating systems: LINUX Introduction–General Overview – Kernel Mode and user mode– Process–Advanced Concepts– Scheduling – Personalities – Cloning – Signals – Development with Linux.

# UNIT HOPEN SOURCE DATABASE

MySQL: Introduction – Setting up account – Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time– Sorting Query Results – Generating Summary – Working with metadata – Using quences – MySQL and Web.

#### UNIT III OPEN SOURCE PROGRAMMING LANGUAGES

PHP: Introduction–Programming in web environment– variables – constants – data types – operators – Statements – Functions – Arrays – OOP – String Manipulation and regular expression – File handling and data storage– PHP and SQL database–PHP and LDAP– PHP Connectivity – Sending and receiving E-mails – Debugging and Error handling – Security – Templates.

## UNITIV PYTHON

Syntax and Style–Python Objects–Numbers–Sequences– Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP– Execution Environment.

#### **UNIT V PERL**

Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures –Subroutines, Packages, and Modules- Working with Files –Data Manipulation.

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At the end of the course the students would be able to

- prepare and do project for the open source software process
- understand the cost estimation techniques during the analysis of the project
- learn the quality concepts for ensuring the functionality of the software
- learn the Database concept
- practice and demonstrate various open source software

## REFERENCES

- 1. Remy Card, Eric Dumas and Frank Mevel, "The Linux Kernel Book", Wiley Publications, 2013
- 2. Steve Suchring, "MySQL Bible", John Wiley, 2012
- 3. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2012
- 4. Wesley J. Chun, "Core Phython Programming", Prentice Hall, 2012
- 5. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2012.

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COs	Programme Outcomes (POs)       PO     PO     PO     PSO     PSO														
СО	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PSO         PSO         PSO         2           2         2         3         2         -         -         -         -         -         -         1         2         2														
CO1	2	2	3	2	-	-	-	-	-	-	-	1	2	2	
CO2	1	2	3	2	3	-	-	-	-	-	-	2	1	2	
CO3	1	2	2	3	3	-	1	-	-		2	2	1	2	
CO4	2	1	2	2	-	-	-	2	-	-	-	-	2	2	
CO5	2	2	2	1	-	-	-	2	-	-	-	3	2	2	



#### CA15403

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#### **COURSE OBJECTIVES**

To enable the students to

- expose the students to the concepts of Data warehousing Architecture and Implementation
- understand Data mining principles and techniques and Introduce DM as a cutting edge business intelligence
- understand the concept of classification for the retrieval purposes
- know the clustering techniques in details for better organization and retrieval of data
- identify Business applications and Trends of Data mining

#### UNIT I DATA WAREHOUSE

Data Warehousing-Operational Database Systems vs.Data Warehouses-Multidimensional Data Model – Schemas for Multidimensional Databases – OLAP Operations – Data Warehouse Architecture – Indexing –OLAP queries & Tools.

#### UNIT II DATA MINING & DATA PREPROCESSING

Introduction to KDD process – Knowledge Discovery from Databases - Need for Data Pre-processing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

## UNIT III ASSOCIATION RULE MINING

Introduction-Data Mining Functionalities-Association Rule Mining - Mining Frequent Item Sets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

## UNIT IV CLASSIFICATION & PREDICTION

Classification vs. Prediction–Data preparation for Classification and Prediction – Classification by Decision Tree Introduction–Bayesian Classification – Rule Based Classification – Classification by Back Propagation –Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods –Prediction– Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods–Model Section.

#### UNIT V CLUSTERING

Cluster Analysis:-Types of Data in Cluster Analysis–A Categorization of Major Clustering Methods– Partitioning Methods – Hierarchical methods – Density-Based Methods – Grid-Based Methods – Model-Based Clustering Methods – Clustering High- Dimensional Data – Constraint-Based Cluster Analysis – Outlier Analysis.

TOTALPERIODS

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At the end of the course the students would be able to

- understanding the Store voluminous data for online processing
- prepare the Pre-process the data for mining applications
- learn the association rules for mining the data
- practice and deploy appropriate classification techniques
- understand the high dimensional data for better organization of the data

# REFERENCES

- Jiawei Han and MichelineKamber, "Data Mining Concepts and Techniques" Second Edition, Elsevier, Reprinted 2012.
- 2. K.P. Soman, ShyamDiwakar and V. Ajay, "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2012.
- G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2013.
- BERSON, ALEX & SMITH, STEPHEN J, Data Warehousing, Data Mining, and OLAP, TMH Pub. Co. Ltd,New Delhi, 2012
- Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Pearson Education, 2012

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COs						Prog	ramme	Outcon	nes (PO	s)					
СО	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         2           1         2         3         1         -         -         1         -         -         3         2         3														
CO1	1	2	3	1	-	-	-	1	-	-	-	3	2	3	
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO3	2	2	3	3	2	-	-	-	-		2	1	1	3	
CO4	2	2	2	2	-	-	-	1	-	-	-	-	2	2	
CO5	2	2	3	3	-	-	-	1	-	-	-	3	2	3	



#### **BIG DATA ANALYTICS**

#### **COURSE OBJECTIVES**

To enable the students to

- understand the Bigdata concept
- understand mining data stream system
- understand the Hadoop concept
- understand usage of file systems
- understand how to buid up framework

## UNIT I INTRODUCTION TO BIG DATA

Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data-Analytic Processes and Tools- Analysis vs Reporting- Modern Data Analytic Tools – Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

# UNIT II MINING DATA STREAMS

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Datain a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies -Real Time Sentiment Analysis, Stock Market Predictions

#### UNIT III HADOOP

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS- Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

## UNIT IV HADOOP ENVIRONMENT

Setting up a Hadoop Cluster-Cluster specification-Cluster Setup and Installation- Hadoop Configuration- Security in Hadoop- Administering Hadoop – HDFS - Monitoring-Maintenance-Hadoop benchmarks- Hadoop in the cloud

#### UNIT V FRAMEWORKS

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper - IBM InfoSphereBigInsights and Streams. Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications

TOTALPERIODS 45

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At the end of the course the students would be able to

- write API based programs
- design and implement data stream systems
- analyze mining data streams
- design Hadoop concept
- understanding the Framwwork applications

# REFERENCES

- 1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2012.
- 2. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reilly Media, 2012.
- 3. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing, 2012
- Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.
- 5. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.

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COs	Programme Outcomes (POs)           PO1         PO2         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PSO         PSO														
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
CO1	1	2	1	2	-	-	-	-	-	-	-	1	1	2	
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO3	2	2	2	2	2	-	-	-	-		2	1	1	3	
CO4	2	1	2	2	-	-	-	2	-	-	-	-	3	2	
CO5	1	2	1	2	-	-	-	2	-	-	-	2	2	2	



# CA15405FREE OPEN SOURCE SOFTWARE LABORATORY320

### **COURSE OBJECTIVES**

To enable the students to

- know of how to do project for the open source software process
- learn the cost estimation techniques during the analysis of the project
- 1. Basic Linux Commands
- 2. Students Details using Shell Program
- 3. Develop PHP program using Arrays, control structures, looping structures and Form Handling Develop a web application for Airline Reservation System using PHP.
- 4. Running Python: some simple exercise e.g. Connecting with MySql database
- 5. Text processing with Perl: simple programs, connecting with database e.g., MYSQL

TOTALPERIODS 60

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# **COURSE OUTCOMES**

At the end of the course the students would be able to

- prepare and do project for the open source software process
- understand the cost estimation techniques during the analysis of the project

			M (1/2/3 i	apping ndicate	of Cour s streng	ses Out th of co	comes v rrelatio	vith Pro n) 3-St	ogramm rong, 2-	e Outcoi Medium,	nes: , 1-Week				
COs	Programme Outcomes (POs)														
СО	PO1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         PSO           PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         10         11         12         1         2													
CO1	1	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO2	2	2	3	2	3	-	-	-	-		2	1	1	3	



# C# and .NET FRAMWORK LABORATORY

# **COURSE OBJECTIVES**

To enable the students to

- learn the cost estimation techniques during the analysis of the project
- understand the quality concepts for ensuring the functionality of the software
  - 1. Programs using Branching, Looping.
  - 2. Programs using Methods, Arrays, Strings.
  - 3. Programs using Structures, Enumerations.
  - 4. Programs using Inheritance.
  - 5. Programs using Polymorphism.
  - 6. Programs using Interfaces.
  - 7. Programs using Operator overloading.
  - 8. Programs using Delegates, Events, Errors and Exceptions.
  - 9. Program to Build an Calculator widget
  - 10. Programs Using Multi Module Assembly
  - 11. Programs using application development on .net.
  - 12. Programs using Web applications.

#### TOTAL PERIOD 60

At the end of the course the students would be able to

- learn the risk management activities and the resource allocation for the projects
- can apply the software estimation and recent quality standards for evaluation of the software projects

			M (1/2/3 i	apping ( ndicate:	of Cour s streng	ses Out th of co	comes w rrelatio	vith Pro n) 3-Stı	ogramm rong, 2-	e Outcoi Medium,	nes: , 1-Week			
COs	Programme Outcomes (POs)													
со	PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO       PO       PO       PSO       PSO       PSO         10       11       12       1       2													
CO1	1	2	2	2	3	-	-	-	-	-	-	2	1	2
CO2	2	2	3	2	3	-	-	-	-		2	1	1	3

Approved BOARD OF STUDIES Master of Computer Applications IA!

# CA15407 TECHNICAL SEMIANR AND REPORT WRITING 0 0 4 2

The goal of this course is to train the students to critically evaluate a well-defined set of research subjects and to summarize the findings concisely in a paper of scientific quality. The paper will be evaluated based on the ability to understand a topic, communicate it and identify the issues. Results from this term paper will be presented to fellow students and a committee of faculty members.

- 1. Every student selects a topic related to current trends and the same should be approved by the respective committee. This selection should have at least 5 distinct primary sources.
- 2. Every student must write a short review of the topic and present it to fellow students and faculty (discuss the topic expose the flaws analyze the issues) every week.
- 3. The faculty should evaluate the short review and award marks with respect to the following.
  - a. Has the student analyzed not merely quoted the most significant portions of the primary sources
  - b. Employed?
  - c. Has the student offered original and convincing insights?
  - d. Plagiarism to be checked.
- 4. Every student should re-submit and present the review article including issues/ comments/ conclusions which had arisen during the previous discussion.
- 5. Every student should submit a final paper as per project specifications along with all short review reports (at least 4 internal reviews) and corresponding evaluation comments.
- 6. Every student should appear for a final external review exam to defend themselves.

# TOTALPERIODS 60

			Ma (1/2/3 i	apping o ndicates	of Cour s streng	ses Out th of co	comes v rrelatio	vith Pro n) 3-Stı	ogramm rong, 2-	e Outcor Medium,	nes: , 1-Week				
COs	Programme Outcomes (POs)														
СО	PO1	Programme Outcomes (POS)PO1PO2PO3PO4PO5PO6PO7PO8PO9POPOPOPSOPSO10111212													
CO1	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO2	1	2	3	1	-	-	-	1	-	-	-	3	2	3	

BOA RD OF STUDIES Master of Computer Application

PCA15408	CAREER DEVELOPMENT LABORATORY 0		0	2	1
UNIT I	CORPORATE READINESS				6
Business Cor	nmunication–Inter& Intra Personal Skills–Business Etiquettes – Corporate Ethics – C	Con	nmu	nica	atior
Media Etique	ette				
UNIT II	INTERVIEW SKILLS				6
Resume Buil	ding - Group Discussions - Presentation Skills - Entrepreneur Skills - Psychometric	A	sses	sme	ent -
Mock Intervie	ew				
UNIT III	QUANTITATIVE APTITUDE (QA) 2				6
Profit & Lo	oss-Clock-Power & Square Roots - Train - Boats & Streams - Probability -	- (	Cale	nda	rs -
Permutations	& Combinations - Partnership – Simplification – Pipes & Cisterns – Puzzles				
UNIT IV	LOGICAL REASONING (LR) 2				6
Statements &	& Assumptions - Matching Definitions - Logical Games - Making Judgments	_	Sta	atem	nents
&Conclusion	s – Verbal Classifications				
UNIT V	VERBAL REASONING (VR) 2				6
Syllogisms –	Data Sufficiency - Dice - Series Completion - Character Puzzles - Cube & Cuboi	d -	- Aı	ithn	netic
Reasoning					

TOTAL PERIODS 30

			Ma (1/2/3 i	apping ( ndicates	of Cour s streng	ses Out th of co	comes v rrelatio	vith Pro n) 3-Stı	ogramm rong, 2-	e Outcor Medium,	nes: , 1-Week				
COs	Programme Outcomes (POs)														
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
CO1	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO2	1	2	3	1	-	-	-	1	-	-	-	3	2	3	



# **ELECTIVE I**

CAE	E15401	ENERGY AWARE COMPUTING	3	0	0	3
COU	URSE O	BJECTIVES				
To e	nable the	e students to				
•	examine	the design of power efficient architecture, power and performance tradeoffs,				
• 1	restructu	ring of software and applications and standards for energy aware Hardware and software	re			
• ]	know the	e fundamental principles energy efficient devices				
•	study the	e concepts of Energy efficient storage				
• ]	know en	ergy efficient techniques involved to support real-time systems				
UNI	ΤI	INTRODUCTION				9
Ener	gy effici	ent network on chip architecture for multi core system-Energy efficient MIPS CPU	core	e wi	th f	ine
grain	ned run ti	me power gating – Low power design of Emerging memory technologies.				
UNI	ΤII	ENERGY EFFICIENT STORAGE				9
Disk	Energy	Management-Power efficient strategies for storage system-Dynamic thermal manage	mer	nt fc	r hi	igh
perfo	ormance	storage systems-Energy saving technique for Disk storage systems.				
UNI	TIII	ENERGY EFFICIENT ALGORITHMS				9
Sche	duling o	of Parallel Tasks - Task level Dynamic voltage scaling - Speed Scaling - Processor	opt	imiz	zatio	on-
Men	netic Alg	orithms – Online job scheduling Algorithms.				
UNI	T IV	REAL TIME SYSTEMS				9
Mult	ti proces	ssor system - Real Time tasks- Energy Minimization - Energy aware schedu	ling	;-Dy	man	nic
Reco	onfigurati	ion-Adaptive power management-Energy Harvesting Embedded system.				
UNI	ΤV	ENERGY AWARE APPLICATIONS				9
On c	hip netw	ork – Video codec Design – Surveillance camera- Low power mobile storage				
		TOTAL PER	<b>NI</b>	DS		45
COU	URSE O	UTCOMES				
At th	ne end of	the course the students would be able to				
•	design P	ower efficient architecture Hardware and Software				
•	analyze p	power and performance tradeoff between various energy aware storage devices				
•	impleme	nt various energy aware algorithms				

- restructure the software and Hardware for Energy aware applications ٠
- design Power efficient architecture Hardware and Software ٠

# REFERENCES

1.Handbook of Energy Aware and Green computing, Ishfaq Ah mad, Sanjay Ranka, Chapman and Hall/

CRC,2012

2. Energy Aware system design Algorithms and Architecture, Chong-Min Kyung, Sungiooyoo, Springer, 2011.

3. Energy Aware computing, Bob steigerwald ,Chris:Luero,Intel Press,2012.

		(1	Mapj /2/3 ind	oing of ( icates st	Courses rength	Outcon of corre	nes with lation) (	n Progra 3-Stron	amme ( g, 2-Me	Dutcom dium, 1	es: l-Week				
COs	Programme Outcomes (POs)														
СО	PO1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         PSO         PSO         2													
CO1	1	2	3	1	-	-	-	1	-	-	-	3	2	3	
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO3	2	2	3	3	2	-	-	-	-		2	1	1	3	
CO4	2	2	2	2	-	-	-	1	-	-	-	-	2	2	
CO5	2	2	3	3	-	-	-	1	-	-	-	3	2	3	



## **COURSE OBJECTIVES**

To enable students to

- understand the basics of cryptography
- learn to find the vulnerabilities in programs and to overcome them,
- · know the different kinds of security threats in networks and its solution
- know the different kinds of security threats in databases and solutions available
- learn about the models and standards for security.

### UNIT I ELEMENTARY CRYPTOGRAPHY

Terminology and Background – Substitution Ciphers – Transpositions – Making Good Encryption Algorithms-Data Encryption Standard- AES Encryption Algorithm – Public Key Encryption – Cryptographic Hash Functions– Key Exchange – Digital Signatures – Certificates .

#### UNIT II PROGRAM SECURITY

Secure programs – Non-malicious Program Errors – Viruses – Targeted Malicious code – Controls Against Program Threat – Control of Access to General Objects – User Authentication – Good Coding Practices – Open Web Application Security Project Flaws – Common Weakness Enumeration Most Dangerous Software Errors

# UNIT III SECURITY IN NETWORKS

Threats in networks – Encryption – Virtual Private Networks – PKI – SSH – SSL – IPSec – Content Integrity – Access Controls – Wireless Security – Honeypots – Traffic Flow Security – Firewalls – Intrusion Detection Systems – Secure e-mail.

#### UNIT IV SECURITY IN DATABASES

Security requirements of database systems – Reliability and Integrity in databases –Redundancy – Recovery – Concurrency/ Consistency – Monitors – Sensitive Data – Types of disclosures – Inference-finding and confirming QL injection

## UNIT V SECURITY MODELS AND STANDARDS

Secure SDLC – Secure Application Testing – Security architecture models – Trusted Computing Base – Bell-LaPadula Confidentiality Model – Biba Integrity Model – Graham-Denning Access Control Model – Harrison-Ruzzo-Ulman Model – Secure Frameworks – COSO – CobiT – Compliances – PCI DSS – Security Standards – ISO 27000 family of standards – NIST.

#### TOTAL PERIODS 45

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At the end of the course the students would be able to

- apply cryptographic algorithms for encrypting and decryption for secure data transmission
- understand the importance of Digital signature for secure e-documents exchange
- understand the program threats and apply good programming practice
- get the knowledge about the security services available for internet and web applications
- understand data vulnerability and sql injection

## REFERENCES

- Charles P. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Fourth Edition, Pearson Education, 2007.
- Michael Whitman, Herbert J. Mattord, "Management of Information Security", Third Edition, Course Technology, 2010.
- 3. William Stallings, "Cryptography and Network Security : Principles and Practices", Fifth Edition, Prentice Hall, 2010.
- Michael Howard, David LeBlanc, John Viega, "24 Deadly Sins of Software Security: Programming Flaws and How to Fix Them", First Edition, McGrawHill Osborne Media, 2009. Matt Bishop, "Computer Security: Art and Science", First Edition, Addison-wesley

			Mapp	oing of (	Courses	Outcom	nes witł	n Progr	amme (	Outcom	es:			
		(1,	/2/3 ind	icates st	rength	of corre	lation)	3-Stron	<u>g, 2-Me</u>	dium, 1	l-Week			
COs	Programme Outcomes (POS)													
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	1	2	1	2	-	-	-	-	-	-	-	1	1	2
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2
CO3	2	2	2	2	2	-	-	-	-		2	1	1	3
CO4	2	1	2	2	-	-	-	2	-	-	-	-	3	2
CO5	1	2	1	2	-	-	-	2	-	-	-	2	2	2

Approved **BOARD OF STUDIES** Master of Computer Application 1

#### **COURSE OBJECTIVES**

To enable the students to

- understand the phases of distributed computing
- be aware of the synchronization
- build concepts communication protocols
- learn about shared memory
- learn the design issues and distributed system concepts

## UNIT I INTRODUCTION

Characterization of distributed systems - Examples - Resource sharing and the web - Challenges – System models - Architectural and fundamental models-Networking and internetworking–Types of networks-Network principles-Internet protocols.

# UNIT II MESSAGE PASSING AND SYNCHRONIZATION

Interprocess communication - The API for the internet protocols - External data representation and marshalling-Client-Server communication - Group communication - Desirable features message passing system- Issues in message passing- Synchronization- Clock synchronization- Event ordering- Mutual exclusion- Deadlock-Election Algorithm - Buffering.

# UNIT III REMOTE PROCEDURE CALL

RPC model - Transparency of RPC- Implementing RPC mechanism- Stub generation- Marshaling arguments and results- Server management- Parameter passing semantics - Call semantics-Communication protocols for RPCs-Complicated RPC client server binding- Exception handling-Security- Special types of RPCs-RPCs in heterogeneous environments- Lightweight RPC.

#### UNIT IV DISTRIBUTED SHARED MEMORY

General architecture of DSM systems- Design and implementation of DSM- Granularity- Structure of shared memory space- Consistency models- Replacement strategy- Thrashing- Other approaches to DSM-Heterogeneous DSM and advantages of DSM.

#### UNIT V DISTRIBUTED NAMING

Introduction- Desirable features of naming system- Fundamental concepts- System oriented names- Object locating mechanisms-Human oriented names- Name caches - Naming and security.

TOTAL PERIODS 45

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At the end of the course the students would be able to

- apply basic principles and practices of Computer Science and Engineering to productively
- engage in the research
- design and conduct experiments, as well as to analyzed
- design the interpret data on experiments relevant to Computer Science practice
- identify, analyze, formulate and solve engineering problems

# REFERENCES

- 1. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems Concepts and Design, Pearson Education, 2009.
- 2. Pradeep K Sinha . Distributed Operating Systems: Concepts and design,. IEEE computerpress, 2007.
- 3. Andrew S Tanenbaum, Maartenvan Steen, Distibuted Systems –Principles and Pardigms, Pearson Education, 2002.
- 4. Mullender, Distributed Systems, Addison Wesley, 1993.
- 5. M.L.Liu, Distributed Computing Principles and Applications, Pearson Education, 2004.

			Mapp	oing of (	Courses	Outcom	nes witł	n Progr	amme (	Outcom	es:				
		(1	/2/3 indi	icates st	rength	of corre	lation)	3-Stron	g, 2-Me	<b>dium,</b> 1	l-Week				
COs	Programme Outcomes (POs)														
СО	PO1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         2													
CO1	1	2	2	2	-	-	-	-	-	-	-	1	1	2	
CO2	2	3	2	2	3	-	-	-	-	-	-	2	2	2	
CO3	2	2	3	2	3	-	-	-	-		1	2	2	2	
CO4	1	2	2	1	-	-	-	2	-	-	-	-	3	2	
CO5	1	3	2	2	-	-	-	2	-	-	-	2	2	2	



#### **COURSE OBJECTIVES**

To enable the students to

- describe approaches to enterprise application integration
- understand the integration middleware
- evaluate the integration approaches suitable for a given problem
- understand the integration
- evaluate the integration approaches against specified requirements

# UNIT I INTRODUCTION

Requirements for EAI - Challenges in EAI – Integration with legacy systems – Integration with partners -Heterogeneous environment–Implementation approaches – Web services, messaging ETL, direct data integration – Middleware requirements – Approaches to integration – services oriented and messaging.

#### UNIT II INTEGRATION PATTERNS

Introduction to integration patterns – Architecture for application integration – Integration patterns – Point to point, broker, message bus, publish/subscribe, Challenges in performance, security, reliability - Case studies

### UNIT III SERVICE ORIENTED INTEGRATION

Business process integration - Composite applications-services – Web services – Service choreography and orchestration-Business process modeling-BPMN, Business process execution–BPEL–Middleware infrastructure-Case studies

#### UNIT IV MESSAGING BASED INTEGRATION

Messaging – Synchronous and asynchronous – Message structure – Message oriented middleware – Reliability mechanisms – Challenges – Messaging infrastructure – Java Messaging Services – Case studies.

## UNIT V ENTERPRISE SERVICE BUS

Enterprise Service Bus – routing, scalable connectivity, protocol and message transformations, data enrichment, distribution, correlation, monitoring – Deployment configurations – Global ESB, Directly connected, Federated ,brokered ESBs–Application server based – Messaging system based– Hardware based ESBs – Support to SOA, message based and event based integrations – Case studies.

TOTAL PERIODS 45

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At the end of the course the students would be able to

- describe different approaches to integration enterprise applications
- analyze specifications and identify appropriate integration approaches
- analyze service oriented integration
- develop a suitable integration design for a given problem
- identify appropriate integration middleware for a given problem

## REFERENCES

- George Mentzas and Andreas Frezen (Eds), "Semantic Enterprise Application Integration for Business Processes: Service-oriented Frameworks", Business Science Reference, 2009
- 2. Waseem Roshen, "SOA Based Enterprise Integration", Tata McGrawHill, 2009.
- G Hohpe and B Woolf, "Enterprise Integration Patterns: Designing, Building, and Deploying Messaging Solutions", Addison-Wesley Professional, 2003
- D Linthicum, "Next Generation Application Integration: From Simple Information to Web Services", Addison-Wesley, 2003
- 5. Martin Fowler, "Patterns of Enterprise Application Architecture", Addison- Wesley, 2003

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COs	Programme Outcomes (POs)														
СО	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO         PO         PO         PSO         PSO         PSO         2														
CO1	2	2	2	2	-	-	-	-	-	-	-	1	2	2	
CO2	2	1	1	2	2	-	-	-	-	-	-	2	1	2	
CO3	2	2	3	2	3	-	-	-	-		2	1	2	2	
CO4	1	2	2	1	-	-	-	2	-	-	-	-	2	2	
CO5	2	3	2	1	-	-	-	1	-	-	-	3	2	3	

Approved BOARD OF STUDIES Master of Computer Application

#### CAE15405

#### **GAME PROGRAMMING**

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#### **COURSE OBJECTIVES**

To enable the students to

- understand of game design and development
- understand the processes, mechanics, issues in game design, game engine development
- understand modelling, techniques, handling situations, and logic
- understand the game platforms and frameworks
- design and develop interactive games

# UNIT I 3D GRAPHICS FOR GAME PROGRAMMING

Coordinate Systems, Ray Tracing, Modeling in Game Production, Vertex Processing, Rasterization, Fragment Processing and Output Merging, Illumination and Shaders, Parametric Curves and Fragment Processing and Output Merging, Illumination and Shaders, Parametric Curves and Animation, Physics-based Simulation

# UNIT II GAME DESIGN PRINCIPLES

Character development, Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection, Game Logic, Game AI, Path Finding

## UNIT III GAMING ENGINE DESIGN

Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics

# UNIT IV GAMING PLATFORMS AND FRAMEWORKS

Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, iOS, Game engines - Adventure Game Studio, DXStudio, Unity

#### UNIT V GAME DEVELOPMENT

Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

# TOTAL PERIODS 45

#### **COURSE OUTCOMES**

At the end of the course the students would be able to

- understand and apply 3 D concepts in Game programming
- gain knowledge about principles and levels of design in various game development
- gain knowledge about gaming engine design for controlling
- analyze various gaming platforms
- explore into various platforms and frameworks available for game development

# REFERENCES

- 1. David H. Eberly, "3D Game Engine Design, Second Edition: A Practical Approach to Real- Time Computer Graphics" Morgan Kaufmann, 2 Edition, 2006.
- 2. JungHyun Han, "3D Graphics for Game Programming", Chapman and Hall/CRC,1st edition,2011
- 3. Mike McShaffrfy, "Game Coding Complete", Third Edition, Charles River Media, 2009.
- 4. Jonathan S. Harbour, "Beginning Game Programming", Course Technology PTR, 3 edition, 2009
- 5. Ernest Adams and Andrew Rollings, "Fundamentals of Game Design", Prentice Hall 1st edition, 2006

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	1	(1	/2/3 ind	icates st	rength	of corre	lation)	3-Stron	g, 2-Me	edium, 1	l-Week				
COs						Progra	mme O	utcome	s (POs)						
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CO1	2	2	3	2	-	-	-	-	-	-	-	1	2	2	
CO2	1	2	2	2	3	-	-	-	-	-	-	2	1	2	
CO3	2	2	3	2	3	-	-	-	-		2	1	1	3	
CO4	2	2	2	2	-	-	-	2	-	-	-	-	2	2	
CO5	1	2	3	1	-	-	-	1	-	-	-	3	2	3	



#### CAE15406

#### SOFT COMPUTING

## **COURSE OBJECTIVES**

To enable the students to

- learn the key aspects of Soft computing
- know about the components and building block hypothesis of Genetic algorithm
- · understand the features of neural network and its applications
- study the fuzzy logic components
- gain insight onto Neuro Fuzzy modeling and control

# UNIT I INTRODUCTION TO SOFT COMPUTING

Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence-Machine Learning Basics

# UNIT II GENETIC ALGORITHMS

Introduction, Building block hypothesis, working principle, Basic operators and Terminologies like individual, gene, encoding, fitness function and reproduction, Genetic modeling: Significance of Genetic operators, Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, GA optimization problems, JSPP (Job Shop Scheduling Problem), TSP (Travelling Salesman Problem), Differences & similarities between GA & other traditional methods, Applications of GA.

## UNIT III NEURAL NETWORKS

Machine Learning using Neural Network, Adaptive Networks – Feed Forward Networks –Supervised Learning Neural Networks – Radial Basis Function Networks - Reinforcement Learning– Unsupervised Learning Neural Networks – Adaptive Resonance Architectures – Advances in neural networks.

# UNIT IV FUZZY LOGIC

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions-Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making

## UNIT V NEURO-FUZZY MODELING

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule base Structure Identification – Neuro-Fuzzy Control – Case Studies.

#### TOTAL PERIODS 45

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At the end of the course the students would be able to

- implement machine learning through neural networks
- gain Knowledge to develop Genetic Algorithm and Support vector machine based machine learning system
- write Genetic Algorithm to solve the optimization problem
- understand fuzzy concepts and develop a Fuzzy expert system to derive decisions
- model Neuro Fuzzy system for data clustering and classification

# REFERENCES

 Jyh-Shing Roger Jang, Chuen-Tsai Sun, EijiMizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hallof India, 2003

- 2. KwangH.Lee, "First course on Fuzzy Theory and Applications", Springer-Verlag Berlin Heidelberg, 2005.
- 3. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.
- 4. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.
- 5. David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley

Mapping of Courses Outcomes with Programme Outcomes: (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Week														
COs	Programme Outcomes (POs)													
СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	2	2	3	2	-	-	-	-	-	-	-	1	2	2
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CO3	2	2	3	2	3	-	-	-	-		2	1	1	3
CO4	1	2	3	2	-	-	-	2	-	-	-	-	2	2
CO5	2	2	1	2	-	-	-	2	-	-	-	3	2	3

