IV SEMESTER

22SES410-ANALOG AND DIGITAL COMMUNICATION

COURSE OUTCOMES:

At the end of this course, students will be able to			
COs		POs mapped	Blooms Taxonomy
CO1	Apply the principles of analog and digital modulation techniques to determine signal characteristics such as bandwidth, power, and noise performance in communication systems.	PO1	K3
CO2	Apply transmitter and receiver models of analog, digital, mobile, and satellite communication systems to analyze signal generation, detection, and recovery processes.	PO1	K3
CO3	Analyze sampling, quantization, pulse modulation, and digital transmission techniques to assess signal distortion, noise, and inter symbol interference.	PO2	K4
CO4	Analyze spread spectrum, multiple access, and wireless communication techniques to examine capacity, interference management, and spectrum efficiency.	PO2	K4
CO5	Evaluate the performance of modern communication systems including cellular and satellite networks based on capacity, reliability, coverage, quality of service and presenting seminar/group discussion.	PO3, PO9, PO11	K5
CO6	Design conceptual communication system solutions by integrating modulation, transmission, multiple access, and networking techniques for real-world applications.	PO3, PO9, PO10,PO11	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-
CO4	-	3	-	-	-	-	-	-	-	-	-
CO5	-	-	3	-	-	-	-	-	2	-	3
CO6	-	-	3	-	-	-	-	-	2	2	3
Average	3	3	3	-	-	-	-	-	2	2	3

22SPC405 COMPUTER ARCHITECTURE

COURSE OUTCOMES:

At the end of the course, students will be able to			
COs	Course Outcome	POs mapped	Blooms Taxonomy
CO1	Explain the fundamental principles of computer architecture, including processor organization, instruction execution, addressing modes, and arithmetic operations	-	K2
CO2	Convert given C code snippets into MIPS instructions and generate corresponding machine code, demonstrating understanding through a written solution or simulator output	PO1, PO5	K3
CO3	Apply number representation and computer arithmetic concepts to solve numerical problems in computer systems.	PO1	K3
CO4	Analyse the given sequence of assembly instructions to identify pipeline hazards and apply appropriate strategy to resolve them .	PO2	K4
CO5	Describe pipelining, memory hierarchy, and parallel processing concepts, ranging from single processors to cloud-scale systems	-	K2
CO6	Collaboratively use RISC-V simulators (Ripes/Venus) to explore and understand pipelining concepts, and produce a team-generated video to effectively communicate the insights	PO1,PO5,PO8,PO9,P10,PO11	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	3	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-
CO4	-	3	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-
CO6	3	-	-	-	3	-	-	3	3	2	2

22SPC406-DATABASE MANAGEMENT SYSTEMS

COURSE OUTCOMES:

At the end of this course, students will be able to			
COs		POs mapped	Blooms Taxonomy
CO1	Apply database system concepts, data models, SQL and NoSQL query operations, normalization rules, and transaction mechanisms to implement correct and functional database applications.	PO1,PO5	K3
CO2	Analyze database requirements and structures by examining ER/EER models, relational schemas, functional dependencies, query processing strategies, concurrency control techniques, and NoSQL data models.	PO2,PO5	K4
CO3	Analyze and optimize database designs and operations by evaluating normalization trade-offs, query execution plans, transaction schedules, recovery techniques, and consistency models across database systems.	PO3,PO5	K4
CO4	Evaluate relational, NoSQL, and advanced database systems—including active, temporal, spatial, multimedia, and deductive databases—based on scalability, performance, consistency, reliability, and application requirements.	PO3,PO5,PO8, PO9	K5
CO5	Design and develop an integrated database solution by combining conceptual modeling, relational and NoSQL implementations, optimized queries, and effective transaction, concurrency, and recovery mechanisms.	PO3,PO5,PO8, PO9	K6
CO6	Create a mini-project or case-study-based database application that addresses a real-world problem by applying ethical data handling, efficient schema design, optimized queries, and appropriate database technologies.	PO3,PO5,PO7,PO8, PO9, PO10,PO11	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	-	-	2	-	-	-	-	-	-
CO2	-	3	-	-	2	-	-	-	-	-	-
CO3	-	-	3	-	2	-	-	-	-	-	-
CO4	-	-	3	-	3	-	-	3	3	-	-
CO5	-	-	3	-	3	-	-	3	3	-	-
CO6	-	-	3	-	3	-	3	3	3	3	3
Average	3	3	3	-	3	-	3	3	3	3	3

22SPC407 SYSTEM PROGRAMMING AND OPERATING SYSTEMS

COURSE OUTCOMES:

At the end of the course, students will be able to			
COs	**COURSE OUTCOMES**	**POs mapped**	**Blooms Taxonomy**
CO1	Explain the working principles of various system programming tools like assemblers, macro processors, loaders, linkers and functions of operating systems such as process management, memory management, storage management and protection.	---	K2
CO2	Apply appropriate CPU scheduling, memory management, deadlock detection, synchronization and virtualization techniques to solve issues related with operating system.	PO1	K3
CO3	Analyse the characteristics and performance of operating system modules includes process management, virtual memory, file systems, Access control and virtual machine implementations.	PO2	K4
CO4	Design system-level components of an operating system to meet specific performance or functional criteria.	PO3	K6
CO5	Evaluate relocation and self-relocating program mechanisms for efficient program execution and memory management, storage management, protection mechanisms, and virtualization models for correctness, fairness, and performance.	PO4, PO8,PO9,PO11	K5
CO6	Create conceptual architectures for process management models, paging, segmentation, file systems, and virtual machines including real-time and distributed systems	PO4, PO5, PO8,PO9,PO11	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	–	–	–	–	–	–	–	–	–	–	–
CO2	3	–	–	–	–	–	–	–	–	–	–
CO3	–	3	–	–	–	–	–	–	–	–	–
CO4	–	–	3	–	–	–	–	–	–	–	–
CO5	–	–	–	3	–	–	–	2	2	–	2
CO6	–	–	–	3	3	–	–	2	2	–	2
Average	3	3	3	2	2	–	–	2	2	-	2

22SPC408 DESIGN AND ANALYSIS OF ALGORITHMS

COURSE OUTCOMES:

Course Outcome	POs mapped	**BL Mapped**
At the end of the course, students will be able to		
CO1: **Ex**plain algorithm design paradigms, complexity classes, and NP-completeness concepts related to algorithm analysis, design techniques and computational limitations.	-	K2
CO2: Apply fundamental algorithmic problem-solving strategies and perform asymptotic analysis to compute time and space complexity of recursive and non-recursive algorithms.	PO1	K3
CO3: Analyse and compare algorithms developed using decrease-and-conquer, greedy, divide-and-conquer, dynamic programming, back tracking and Branch and Bound techniques with respect to suitability, correctness and efficiency for given problems.	PO2	K4
CO4: Design efficient algorithms for computationally complex problems using advanced design paradigms such as dynamic programming, backtracking, branch and bound, and approximation methods for NP-hard problems.	PO3	K5
CO5: Implement, evaluate, and document algorithmic solutions through hands-on programming and Group discussions demonstrating effective use of modern tools, ethical reasoning, teamwork and communication.	PO5, PO8, PO9, PO10	K5
CO6: Identify, learn, and adapt emerging algorithmic techniques and tools independently and demonstrating continuous learning through self-study reports or seminars.	PO11	K5

CO-PO Mapping:

CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO1											
CO2	**3**										
CO3		**3**		**2**							
CO4			**3**								
CO5					**3**			**3**	**3**	**3**	
CO6											**3**

22SPC409 THEORY OF COMPUTATION

COURSE OUTCOMES:

	The Course Outcome (CO)	POs mapped	BL Mapped
At the end of the course, students will have the ability to			
CO1	Apply formal language theory and automata models to solve computation and language-recognition problems using appropriate analytical techniques.	PO1	K3
CO2	Analyze and compare computational models to determine their suitability and limitations for decision problems.	PO2	K4
CO3	Design automata, grammars, and abstract machines collaboratively to model complex systems and algorithms.	PO3	K6
CO4	Evaluate the limits of computation by analyzing decidable and undecidable problems using formal proof and reducibility techniques.	PO4	K5
CO5	Demonstrate independent and lifelong learning by exploring advanced topics, theoretical tools, and developments related to computation theory.	PO5, PO9, PO10, PO11	K6
CO6	Communicate formal solutions, proofs, and computational models effectively through written and oral presentations.	PO9, PO10, PO11	K6

CO-PO MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	3	1	-
CO2	-	3	-	-	-	-	-	-	-	-	-	3	1	-
CO3	-	-	3	-	-	-	-	-	-	-	-	3	1	-
CO4	-	-	-	3	-	-	-	-	-	-	-	3	-	3
CO5	-	-	-	-	2	-	-	-	2	2	3	-	-	3
CO6	-	-	-	-	-	-	-	-	2	3	2	-	-	-
Average	3	3	3	3	2	-	-	-	2	2.5	2.5	3	1	3

22SPC410 DATABASE MANAGEMENT SYSTEMS LABORATORY

COURSE OUTCOMES:

Course Outcome		**POs mapped**	**BL Mapped**
At the end of the course, students will be able to			
CO1	Create a database schema for any real-world problem with integrity constraints	PO1,PO2, PO3,PO5	K6
CO2	Create and manipulate a database using DDL, DML, DCL and TCL commands	PO1, PO2,PO5	K3
CO3	Develop stored procedures, functions, cursors, and triggers to enforce business logic and database automation	PO1, PO3,PO5	K6
CO4	Design and develop simple database applications with front end and back end design with report generation	PO1,PO2,PO3,PO5	K6
CO5	Identify and apply ethical, security, and societal considerations in database design**,** including data privacy, access control, and responsible data usage.	PO6,PO8	K4
CO6	Collaborate effectively in teams to design, implement, and document a database application, and present results using technical reports and demonstrations.	PO9,PO10	K4

CO PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	-	2	-	-	-	-	-	-
CO2	2	2	-	-	3	-	-	-	-	-	-
CO3	3	-	3	-	3	-	-	-	-	-	-
CO4	3	3	3	-	3	-	-	-	-	-	-
CO5						3		3			
CO6									3	3	

22SPC411 SYSTEM PROGRAMMING AND OPERATING SYSTEMS LABORATORY

COURSE OUTCOMES:

At the end of the course, students will be able to			
COs		**POs mapped**	**Blooms Taxonomy**
CO1	Design the analysis and synthesis phases of assembler and validate system software tools including a macro processor, linkers, and loaders.	PO1	K3
CO2	Analyze operating system process management algorithms including process synchronization, CPU scheduling, and deadlock detection.	PO2	K4
CO3	Design and Implement memory management techniques including paging, segmentation, page replacement to optimize memory usage in system simulations	PO3	K6
CO4	Implement and evaluate Storage management techniques including file system, disk scheduling, allocation methods to efficient storage utilization	PO4, PO9	K5
CO5	Configure and deploy operating system security, protection mechanisms, and virtualization environments to emphasizes real-world OS configuration	PO5,PO11	K5
CO6	Collaborate effectively in teams to design and implement a functional operating system module simulating key OS functions.	PO4,PO5,PO8,PO9,PO11	K6

CO PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	–	–	–	–	–	–	–	–	–	–
CO2	–	3	–	–	–	–	–	–	–	–	–
CO3	–	–	3	–	–	–	–	–	–	–	–
CO4	–	–	–	2	–	–	–	–	2	–	
CO5	–	–	–	–	3	–	–	–	–	–	2
CO6	–	–	–	3	3	–	–	2	2	–	3
Average	3	3	3	3	3	–	–	2	2	–	2

VI SEMESTER

22SPC617-COMPUTER NETWORK SECURITY

COURSE OUTCOMES:

At the end of this course, students will be able to			
COs		POs mapped	Blooms Taxonomy
CO1	Apply fundamental concepts of information security, network security architecture, and cryptographic principles to protect data and communication systems.	PO1	K3
CO2	Apply symmetric and asymmetric cryptographic techniques, key distribution mechanisms, and authentication methods to secure network communications and access control systems.	PO1	K3
CO3	Analyze network vulnerabilities, security threats, cryptographic weaknesses, and attack techniques to determine potential risks in networked systems.	PO2	K4
CO4	Analyze access control models, identity management frameworks, and security protocols to assess their effectiveness in securing wired, wireless, and cloud environments.	PO2	K4
CO5	Evaluate the effectiveness of network defense mechanisms, security protocols, and countermeasures against real-world cyber attacks and system threats.	PO2, PO11	K5
CO6	Design secure network security solutions by integrating cryptographic algorithms, access control policies, security protocols, and defense tools for practical network environments.	PO3, PO5	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-
CO4	-	3	-	-	-	-	-	-	-	-	-
CO5	-	3	-	-	-	-	-	-	-	-	3
CO6	-	-	3	-	3	-	-	-	-	-	-
Average	3	3	3	-	3	-	-	-	-	-	3

22SPC618 COMPILER DESIGN

COURSE OUTCOMES:

At the end of this course, students will be able to			
COs		POs mapped	Blooms Taxonomy
CO1	Apply lexical analysis concepts to construct lexical analyzers using regular expressions, finite automata, DFA minimization techniques, and compiler construction tools such as LEX.	PO1,PO5	K3
CO2	Analyze context-free grammars to construct and compare top-down and bottom-up parsing techniques, including LL(1), SLR, LR(1), and LALR parsers.	PO2,PO5	K4
CO3	Apply syntax-directed definitions and translation schemes to generate syntax trees and intermediate code representations, including three-address code with type checking.	PO1	K3
CO4	Analyze run-time storage management mechanisms such as stack and heap allocation, parameter passing, non-local access, and garbage collection in compiler execution.	PO2,PO11	K4
CO5	Design code generation strategies by applying instruction selection, register allocation, and assignment techniques for efficient target code generation.	PO3,PO11	K6
CO6	Evaluate program performance by applying local and global code optimization techniques, including DAGs, data-flow analysis, constant propagation, and peephole optimization.	PO4,PO5,PO11	K5

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3				3						
CO2		3			2						
CO3	3										
CO4		3									1
CO5			3								1
CO6				3	2						2
Average	3	3	3	3	3						2

22SPC619 Machine Learning

COURSE OUTCOMES:

At the end of the course, students will be able to			
COs	Course Outcome	POs mapped	Blooms Taxonomy
CO1	Explain and interpret the core machine learning concepts and algorithms including supervised, unsupervised, probabilistic, and reinforcement learning along with their assumptions and areas of application.	-	K2
CO2	Apply mathematical and computational principles to implement and evaluate supervised, unsupervised, probabilistic, and reinforcement learning models	PO1	K3
CO3	Analyze machine learning models to identify bias, interpretability issues, sustainability concerns and potential societal impacts using real-world datasets and case studies.	PO2, PO6	K4
CO4	Apply dimensionality reduction techniques on real-world datasets and present results using cloud-based platforms such as Google Colab.	PO3, PO5,PO6	K3
CO5	Investigate data and model behavior to develop ethically responsible ML solutions, evaluate bias, transparency, its societal impact and justify decisions through debates or seminar	PO4,PO7, PO9,PO11	K5
CO6	Work effectively in diverse teams to solve machine learning problems, prepare educational videos and maintain project code on GitHub to demonstrate professional and technical communication skills	PO3,PO5, PO8,PO9,PO10,PO11	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	**-**	**3**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**
CO4	**-**	**-**	**3**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**
CO5	-	-	**-**	**2**	-	-	**2**	**-**	**3**	**-**	**2**
CO6	-	-	**3**	**-**	**3**	-	**-**	**3**	**3**	**2**	**2**

22SPE$02 ETHICS AND AI

COURSE OUTCOMES:

At the end of this course, students will be able to			
COs		POs mapped	Blooms Taxonomy
CO1	Apply ethical principles, governance frameworks, and human-centered approaches to identify and address ethical issues across diverse Artificial Intelligence systems and applications.	PO1	K3
CO2	Analyze ethical challenges in Artificial Intelligence by examining accountability, transparency, responsibility, fairness, autonomy, and social failure modes in technological, legal, and societal contexts.	PO2	K4
CO3	Analyze and compare normative models, professional codes, standards, and human-rights-based governance mechanisms to assess their role in regulating Artificial Intelligence.	PO2	K4
CO4	Evaluate the ethical implications of Artificial Intelligence deployments in domains such as transport, healthcare, military, law, education, and smart cities, considering social, economic, legal, and moral trade-offs.	PO6, PO7, PO9, PO10, PO11	K5
CO5	Evaluate the effectiveness of methodological approaches and design choices for AI ethics by balancing ethical values, economic considerations, and stakeholder interests.	PO6, PO7, PO9, PO10, PO11	K5
CO6	Design ethically responsible Artificial Intelligence strategies, guidelines, or policy recommendations by integrating ethical principles, governance models, and societal perspectives for real world applications.	PO3	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3										
CO2		3									
CO3		3									
CO4						3	3		1	2	2
CO5			3			3	3		2	3	2
CO6			3								
Average	3	3	3			3	3		2	3	2

22SPC620 COMPILER DESIGN LABORATORY

COURSE OUTCOMES:

At the end of the course, students will be able to			
COs		POs mapped	Blooms Taxonomy
CO1	Apply lexical analysis and parsing tools namely LEX/ FLEX and YACC/BISON to recognize tokens	PO1, PO5	K3
CO2	Analyze context free grammars and parsing techniques (LL,LR) to detect ambiguity, parsing conflict and correctness of syntax analysis	PO2	K4
CO3	Design intermediate representations namely syntax tress and three address codes for simple programming constructs	PO3	K6
CO4	Create compiler components including symbol table, syntax analyzer and intermediate code generator using appropriate compiler tools such as LEX,FLEX,YACC,BISON and C.	PO5	K6
CO5	Evaluate code optimization techniques and target code generation by comparing performance, memory usage and correctness of machine level code	PO6	K5
CO6	Work in teams to plan, implement, document and demonstrate a scenario based mini compiler such mini rule engine compiler for student result processing system, mini loan eligibility rule compiler, crop disease alert rule compiler, traffic violation rule processing compiler, medical triage rule engine compiler by integrating all phases of compiler design.	PO8, PO9,PO10,PO11	K6

CO PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	-	-	-	3	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-
CO3			3	-		-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	3	3	3
Average	3	3	3	-	3	3	-	3	3	3	3

22SES612 DESIGN THINKING FOR COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOMES:

	The Course Outcome (CO)	POs mapped	BL Mapped
At the end of the course, students will have the ability to			
CO1	Apply structured lateral thinking techniques to generate multiple alternative solutions.	PO1	K3
CO2	Analyze problems from diverse user perspectives to clearly define design challenges.	PO2	K4
CO3	Create original solution concepts using creative ideation techniques under constraints.	PO3	K6
CO4	Develop and iterate prototypes by applying the complete design thinking process.	PO3	K6
CO5	Evaluate design solutions through usability testing and feedback analysis by working effectively in teams, communicating design outcomes, and managing time and tasks.	PO4, PO9, PO10, PO11	K5
CO6	Evaluate real-world case studies to justify the application of lateral and design thinking principles through structured team discussion, technical presentation, and reflective reporting.	PO4, PO9, PO10, PO11	K5

CO-PO MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	1	2	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	2	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-	2	2
CO4	-	-	3	-	-	-	-	-	-	-	-	1	3	2
CO5	-	-	-	3	-	-	-	-	3	3	3	-	2	1
CO6	-	-	-	3	-	-	-	-	2	3	2	-	2	2
Average	3	3	3	3	-	-	-	-	2.5	3	2.5	1	2.16	1.75

22SEE602 MACHINE LEARNING LABORATORY

COURSE OUTCOMES:

At the end of the course, students will be able to			
COs	Course Outcome	POs mapped	Blooms Taxonomy
CO1	Demonstrate fundamental Python programming concepts, including data types, control structures, functions, file input/output, regular expressions, and modular programming using cloud-based platforms.	PO1,PO5, PO11	K3
CO2	Implement supervised learning algorithms such as decision trees, support vector machines, multilayer perceptrons and random forest on real-world datasets using cloud-based platforms and analyze model performance in applications like spam detection, facial recognition, character recognition and sentiment analysis	PO3,PO4, PO5, PO11	K6
CO3	Design and implement probabilistic models, including Bayesian networks and Hidden Markov Models on real-world datasets using cloud-based platforms and analyze model performance in applications such as medical diagnosis, sequence modelling and pattern recognition.	PO3,PO4, PO5, PO11	K6
CO4	Implement non-parametric Locally Weighted Regression on real-world datasets using cloud-based platforms and interpret model effectiveness in predicting or fitting data	PO3, PO4,PO5, PO11	K6
CO5	Design and implement clustering algorithms for unsupervised learning on real-world datasets using cloud-based platforms and visualize the results.	PO3, PO5,PO11	K6
CO6	Develop, implement, and evaluate machine learning solutions for social problems through a mini-project, applying ethical principles, teamwork, and professional practices to design and present effective models	PO1,PO2, PO3, PO4,PO5, PO6, PO7,PO8, PO9, PO10,PO11	K6

CO-PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	**3**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**2**
CO2	**-**	**-**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**
CO3	**-**	**-**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**
CO4	**-**	**-**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**
CO5	**-**	**-**	**3**		**3**	**-**	**-**	**-**	**-**	**-**	**2**
CO6	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**