NEW HORIZON
COLLEGE OF ENGINEERING

Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade.

Department of Computer Science and Engineering

Academic Year 2017-18

M.Tech in Computer Science and Engineering

Third and Fourth Semesters
Scheme and Syllabus

NEW HORIZON COLLEGE OF ENGINEERING

M.TECH COMPUTER SCIENCE AND ENGINEERING

CREDIT SCHEME FOR THIRD SEMESTER

THIRD SEMESTER-M.TECH COMPUTER SCIENCE AND ENGINEERING												
S.No	**Course code**	**course**	**BOS**	**Credit distribution**				**Overall credits**	**Contact Hours**	**Marks**		
				L	**P**	**T**	**S**			**CIE**	**SEE**	**TOTAL**
1	16SCS31x	Specialization Elective-3	CSE	4	0	0	1	5	4	50	50	100
2	16SCS32	Internship	CSE	0	2	0	0	2	-	50	50	100
3	16SCS33	Seminar	CSE	0	0	0	2	2	-	50	50	100
4	16SCS34	Project Phase-1	CSE	0	16	0	7	16	-	50	50	100
Total								25	4	200	200	400

Specialization Elective-3	
Course code	**course**
16SCS311	Internet of Things (IOT)
16SCS312	Mobile Application Development
16SCS313	Computer Systems- Performance Analysis
16SCS314	Natural Language Processing

INTERNET OF THINGS

Course Code : 16SCN31/16SCS31 | **Credits : 05**
L:P:T:S : 4:0:0:1 | **CIE Marks : 50**
Exam Hours : 03 | **SEE Marks : 100**

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	Interpret on various IoT protocols, design and their standardization challenges
CO2	Develop a networked programming using python libraries
CO3	Design a portable IoT using Arduino/equivalent boards and relevant protocols
CO4	Develop a web services to access/control IoT devices
CO5	Deploy an IoT application and connect to the cloud
CO6	Analyze specifications in real time scenarios

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	3	3	3	3	3	3
CO2	-	-	-	-	-	2	3	3	3	3	3	3
CO3	-	-	-	-	-	2	3	3	3	3	3	3
CO4	-	-	-	-	-	2	3	3	3	3	3	3
CO5	-	-	-	-	-	2	3	3	3	3	3	3
CO6	-	-	-	-	-	2	3	3	3	3	3	3

SYLLABUS			
Module no	**Module Contents**	**Hrs**	**COs**
1	**FUNDAMENTALS OF IOT** Introduction-Characteristics-Physical design - Protocols – Logical design – Enabling technologies – IoT Levels – Domain Specific IoTs – IoT vs M2M(Machine-to-Machine).	9	CO1, CO2
2	**IOT DESIGN METHODOLOGY**IoT systems management – IoT Design Methodology – Specifications Integration and Application Development using Python-Networked programming using python libraries	9	CO3
3	**BUILDING IOT WITH RASPBERRY PI**	9	CO4,CO5,

	Physical device – Raspberry Pi Interfaces – Programming – Application Programming Interface(APIs)/ Packages – Web services- Amazon web services		CO6
4	**BUILDING IOT WITH GALILEO/ARDUINO** Intel Galileo Gen2 with Arduino- Interfaces - Arduino IDE – Programming - APIs and Hacks	9	CO4,CO5, CO6
5	**CASE STUDIES and ADVANCED TOPICS** Various Real time applications of IoT(smart transportation, smart cities, smart living, smart energy, smart health, and smart learning)- Connecting IoT to cloud – Cloud Storage for Iot – Data Analytics for IoT – Software & Management Tools for IoT	9	CO4,CO5, CO6

Text Books / Reference books:

1. ArshdeepBahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.

2. Manoel Carlos Ramon, "Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers", Apress, 2014.

3. Marco Schwartz, "Internet of Things with the Arduino Yun", Packt Publishing, 2014.

4.Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

5. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013

Assessment Pattern

CIE- Continuous Internal Evaluation (50 Marks)

Bloom's Category	Tests	Assignments	Quizzes	Self Study
Marks (out of 50)	20	10	10	10
Remember	5	-	-	-
Understand	5	-	-	-
Apply	5	-	5	-
Analyze	5	5	-	-
Evaluate	-	-	5	5
Create	-	5	-	5

SEE- Semester End Examination (50 Marks)

Bloom's Category	Tests
Remember	0
Understand	10
Apply	10
Analyze	10
Evaluate	5
Create	5

NEW HORIZON COLLEGE OF ENGINEERING

M.TECH COMPUTER SCIENCE AND ENGINEERING

CREDIT SCHEME FOR FOURTH SEMESTER

FOURTH SEMESTER-COMPUTER SCIENCE AND ENGINEERING												
S.No	**Course code**	**course**	**BOS**	**Credit distribution**				**Overall credits**	**Contact Hours**	**Marks**		
				L	**P**	**T**	**S**			**CIE**	**SEE**	**TOTAL**
1	16SCS41x	Specialization Elective-4	CSE	4	0	0	1	5	4	50	50	100
2	16SCS42	Internship	CSE	0	3	0	0	3	-	50	50	100
3	16SCS43	Seminar	CSE	0	0	0	2	2	-	50	50	100
4	16SCS44	Project Phase-2	CSE	0	15	0	0	15	-	50	50	100
Total								25	4	200	200	400

Specialization Elective-4	
Course code	**course**
16SCS411	Agile Technologies
16SCS412	Machine Learning
16SCS413	Advances in Computational Security
16SCS414	High Performance Computing

MACHINE LEARNING

Course Code : 16SCS412
L:P:T:S : 4:0:0:1
Exam Hours : 03

Credits : 05
CIE Marks : 50
SEE Marks : 50

Course Outcomes: At the end of the Course, the Student will be able to:

CO1	To understand the basic concepts of learning and decision trees.
CO2	To understand the neural networks and genetic algorithms

CO3	To understand the Bayesian techniques
CO4	To understand the instant based learning
CO5	To understand the analytical learning and reinforced learning
CO6	To understand and apply inverted deduction

Mapping of Course Outcomes to Program Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	1					1	1	1	2
CO2	1	1	2	2	2	1	1	1	1	1	1	2
CO3	1	1	1	2	2	1	1	1	1	1	1	2
CO4	1	1	2	2	3	1	1	1	2	1	1	2
CO5	1	2	2	3	3	2	2	2	3	3	3	2
CO6	1	1	1	2	3	2	2	1	2	3	3	2

SYLLABUS			
Sl. No.	**Contents of Module**	**Hrs**	**COs**
1	**INTRODUCTION, CONCEPT LEARNING AND DECISION TREES** Learning Problems – Designing Learning systems, Perspectives and Issues – Concept Learning – Find-S-finding a maximally specific hypothesis-Version Spaces and Candidate Elimination Algorithm – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.	**9**	**CO1 & CO6**
2	**NEURAL NETWORKS AND GENETIC ALGORITHMS** Neural Network Representation – Problems – Perceptions – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evolution and Learning.	**9**	**CO2 & CO6**
3	**BAYESIAN AND COMPUTATIONAL LEARNING** Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probably Learning – Sample Complexity for Finite and Infinite Hypothesis Spaces – Mistake Bound Model.	**9**	**CO4 &CO6**
4	**INSTANT BASED LEARNING AND LEARNING SET OF**	**9**	**CO5 & CO6**

	RULES K- Nearest Neighbor Learning – Locally Weighted Regression – Radial Basis Functions – Case-Based Reasoning – Sequential Covering Algorithms – Learning Rule Sets – Learning First Order Rules – Learning Sets of First Order Rules – Induction as Inverted Deduction – Inverting Resolution		
5	**ANALYTICAL LEARNING AND REINFORCED LEARNING** Perfect Domain Theories – EBG Remarks on Explanation Based Learning – Inductive-Analytical Approaches - FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning-Relationship to Dynamic Programming	**9**	**CO4 & CO6**

Text Books:

1. Tom M. Mitchell, "Machine Learning", McGraw-Hill Education (INDIAN EDITION), 2013.

2. An Algorithmic Perspective, "Stephen Marsland,Taylor & Francis(CRC)

References Books:

3. Ethem Alpaydin, "Introduction to Machine Learning", 2nd Ed., PHI Learning Pvt. Ltd., 2013.

4. T. Hastie, R. Tibshirani, J. H. Friedman, "The Elements of Statistical Learning", Springer; 1st edition, 2001.