राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUE OF TECHNOLOGY PATNA
संगणक विज्ञान एंव अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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No:- Date:

Artificial Intelligence of Things (AIoT) **L-T-P-Cr: 3-0-2-4**

Pre-requisites: Fundamental knowledge of Internet of Things

Objective:

1. To recall the Internet of Things concepts
2. To learn the concepts of Data Science and Machine Learning
3. To model real word problems as IoT business use case
4. To understand the process of decision making in IoT

Course Outcomes:

At the end of the course, a student should be able to:

Sl. No.	Outcome
1.	Articulate real world problems as IoT use cases
2.	Apply the concepts of exploratory data analysis for solving IoT business use cases
3.	Devise predictive models for IoT solutions
4.	Apply machine learning concepts to the predictive models
5.	Apply predictive analytics for improving intelligent IoT solutions

Course Contents:

UNIT I: **Lectures: 8**

Introduction to IoT, Logical stack of IoT, The problem life cycle, The problem landscape, The art of problem solving, The problem solving framework

IoT Problem Universe: Connected assets & connected operations, Defining the business use case, Sensing the associated latent problems, Designing the heuristic driven hypotheses matrix (HDH)

UNIT II: **Lectures: 8**

Identifying gold mines in data for decision making, Exploring each dimension of the IoT Ecosystem through data, Studying relationships, Exploratory data analysis, Root Cause Analysis,

UNIT III: **Lectures: 6**

Predictive Analytics for IoT: Linear regression, Decision Trees, Logistic Regression

UNIT IV: **Lectures: 10**

Enhancing Predictive Analytics with Machine Learning for IoT: Random Forest, Neural Networks and Deep Learning,

UNIT V: **Lectures: 10**

Decision Science with IoT: Setting context for the problem, Defining the problem and designing the approach, Exploratory Data Analysis and Feature Engineering, Building predictive model, Packaging the solution, Prescriptive Science and Decision Making

Text Books:

1. Jojo Moolayil, “Smarter Decisions - The Intersection of Internet of Things and Decision Science”, First Edition, Packt Publishing Limited, Birmingham, UK

Reference Books:

1. Robert Barton, Patrick Grossetete, David Hanes, Jerome Henry, Gonzalo Salgueiro, “IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things”, First Edition, Cisco Press, USA.
2. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, 1st Edition, Academic Press, 2014.
3. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
4. Daniel Minoli, “Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications”, ISBN: 978-1-118- 47347-4, Willy Publications
5. Vijay Madisetti and ArshdeepBahga, “Internet of Things (A Hands-onApproach)”, 1st Edition, VPT, 2014.