

SHRI VENKATESHWARA UNIVERSITY



Syllabus

***Diploma
Computer Science***

VI Semester

***(Three Years Programme)
(w.e.f. 2019-20)***

***SCHOOL OF ENGINEERING &
TECHNOLOGY***

Computer Science
VI - SEMESTER

Sl No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	PCS- 601	Multimedia Technologies	3	0	0	20	10	30		70		100	3
2	PCS- 602	Fundamentals of AI	3	0	0	20	10	30		70		100	3
3	PCS-603	Artificial Intelligence & Machine Learning	3	0	0	20	10	30		70		100	3
4	PES-666	Entrepreneurship and Start-ups	3	1	0	20	10	30		70		100	4
5	PCS- 611	Multimedia Technologies Lab	0	0	2				10		15	25	1
6	PCS-612	Project Phase -II	0	0	1 2				100		100	200	6
	PCS-613	Seminar	1	0	0				50			50	1
7	AUD- 111	Indian Constitution	2	0	0								0
8												675	21

Course Code	:	PCS- 601
Course Title	:	<i>Multimedia Technologies</i>
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	COPC203, COPC204, COPC208
Course Category	:	PE

Course Learning Objectives:

To introduce students to the domain of Multimedia Technologies, which explain the technologies underlying digital images, videos and audio contents, including various compression techniques and standards, and the issues to deliver multimedia content over the Internet.

Course Content:

UNIT 1: Introduction to Multimedia

Multimedia Foundation and Concepts: Multimedia Hardware, Multimedia Software, Multimedia operating systems, Multimedia communication system

UNIT 2: Basic Compression Techniques

Video and Audio Data Compression Techniques – Lossy and Lossless. Example algorithms/standards: Huffman, RLE, JPEG, MPEG, MP3, MP4, LZMA, FLAC, ALAC, ITU G.722, H.261, H.265

UNIT 3: Content Development and Distribution

Desktop publishing (Coral Draw, Photoshop, Page maker)

Multimedia Animation & Special effects (2D/3D animation, Flash)

UNIT 4: Introduction to Digital Imaging

Basics of Graphic Design and use of Digital technology, Definition of Digital images, Digital imaging in multimedia

UNIT 5: Introduction to Multimedia Programming and Applications Suggested Lab

Work:

This is a skill course. Topics/tools taught in the class should be practiced in the Lab same week and practiced regularly during the semester till student becomes confident about it. Students should explore features of various tools introduced during the course and become comfortable with their use. Teacher should give weekly tasks as assignment.

Reference Books:

1. *An Introduction to Multimedia Authoring, A. Eliens*
2. *Fundamentals of Multimedia, Prentice Hall/Pearson, Ze-Nian Li & Mark S. Drew.*
3. *Multimedia and Animation, V.K. Jain, Khanna Publishing House, Edition 2018*
4. *Fundamentals of Multimedia, Ramesh Bangia, Khanna Book Publishing Co., N. Delhi (2007)*

Course outcomes:

Student will understand various aspects of Multimedia and related standards. Student will be able to build multimedia content and applications and also multimedia enable Web applications and mobile applications.

Course Code	:	PCS- 602
Course Title	:	<i>Fundamentals of AI</i>
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	COPC207
Course Category	:	PE

Course Learning Objectives:

To introduce students to the domain of Artificial Intelligence.

Course Content:

UNIT 1: Introduction

Overview and Historical Perspective, Turing test, Physical Symbol Systems and the scope of Symbolic AI, Agents.

UNIT 2: Search

Heuristic Search: Best First Search, Hill Climbing, Beam Search, Tabu Search Randomized

*Search: Simulated Annealing, Genetic Algorithms, Ant Colony Optimization. **UNIT 3:***

Finding Optimal Paths: Branch and Bound, A, IDA*, Divide and Conquer approaches, Beam Stack Search.*

Problem Decomposition: Goal Trees, AO, Rule Based Systems, Rete Net. Game*

Playing: Minimax Algorithm, AlphaBeta Algorithm, SSS.*

UNIT 4:

Planning and Constraint Satisfaction: Domains, Forward and Backward Search, Goal Stack Planning, Plan Space Planning, Graphplan, Constraint Propagation.

UNIT 5:

Logic and Inferences: Propositional Logic, First Order Logic, Soundness and Completeness, Forward and Backward chaining.

Reference Books:

1. Deepak Khemani. *A First Course in Artificial Intelligence*, McGraw Hill Education (India)
2. <https://nptel.ac.in/courses/106106126/>
3. Stefan Edelkamp and Stefan Schroedl. *Heuristic Search*, Morgan Kaufmann.
4. Pamela McCorduck, *Machines Who Think: A Personal Inquiry into the History and Prospects of Artificial Intelligence*, A K Peters/CRC Press
5. Elaine Rich and Kevin Knight. *Artificial Intelligence*, Tata McGraw Hill.
6. Stuart Russell and Peter Norvig. *Artificial Intelligence: A Modern Approach*, Prentice Hall
7. M.C. Trivedi, *A classical approach to Artificial Intelligence*, Khanna Publishing House

Course outcomes:

Student will have general idea about Artificial Intelligence, will be able to explore AI tools effectively.

Course Code	:	PCS-603
Course Title	:	<i>ARTIFICIAL INTELLIGENCE & MACHINE LEARNING</i>
Number of Credits	:	3 (L: 3, T: 0, P: 0)
Prerequisites	:	NIL
Course Category	:	OE

Course Learning Objectives:

Have a thorough understanding of classical and modern AI applications. Be able to implement a wide range of AI concepts using Prolog. Understand non-classical AI approaches such as genetic algorithms and neural networks. Be able to assess the potential of AI in research and real-world environments.

Course Content:

UNIT-I: Introduction: History and foundations of AI, Problem solving: Uninformed and informed Search; Constraint Satisfaction Problems and Constrained Optimization problems (complete and incomplete techniques).

UNIT-II: Adversarial Search: Two players games, games with uncertainty; Decision support systems and technologies; Knowledge representation, Reasoning, Expert systems Contents (2/2), Planning (basics).

UNIT-III: Machine learning Basics: Decision trees, Ensemble learning, Reinforcement learning, Evolutionary computation, Neural networks, Problems, data, and tools; Visualization;

UNIT-IV: Linear regression; SSE; gradient descent; closed form; normal equations; features, Over fitting and complexity; training, validation, test data, and introduction to Matlab.

UNIT-V: Classification problems; Decision boundaries; Probability and classification, Bayes optimal decisions, Naive Bayes and Gaussian class-conditional distribution.

References:

1. Russell, Norvig, *Artificial intelligence: A modern approach*, 2nd edition. Pearson/Prentice Hall.
2. M.C. Trivedi, *A classical approach to Artificial Intelligence*, Khanna Publishing House, New Delhi (2018)
3. V.K. Jain, *Machine Learning*, Khanna Publishing House, New Delhi (2018)
4. Ethem Alpaydin, *Introduction to Machine Learning*, Second Edition, <http://mitpress.mit.edu/catalog/item/default.asp?type=2&tid=12012>.

Course outcomes:

At the end of the course, the student will be able to:

<i>Identify problems that are amenable to solution by AI methods.</i>
<i>Design and carry out an empirical evaluation of different algorithms on a problem formalization, and state the conclusions that the evaluation supports.</i>
<i>Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.</i>
<i>able to design and implement various machine learning algorithms in a range of real-world applications.</i>
<i>Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.</i>

<i>Course Code</i>	<i>:</i>	<i>PES-666</i>
<i>Course Title</i>	<i>:</i>	<i>Entrepreneurship and Start-ups</i>
<i>Number of Credits</i>	<i>:</i>	<i>4</i>
<i>Prerequisites (Course code)</i>	<i>:</i>	<i>None</i>
<i>Course Category</i>	<i>:</i>	<i>HS</i>

Course Learning Objectives:

1. *Acquiring Entrepreneurial spirit and resourcefulness.*
2. *Familiarization with various uses of human resource for earning dignified means of living.*
3. *Understanding the concept and process of entrepreneurship - its contribution and role in the growth and development of individual and the nation.*
4. *Acquiring entrepreneurial quality, competency, and motivation.*

5. *Learning the process and skills of creation and management of entrepreneurial venture.*

Course Content:

Unit 1 - Introduction to Entrepreneurship and Start – Ups

- *Definitions, Traits of an entrepreneur, Intrapreneurship, Motivation*
- *Types of Business Structures, Similarities/differences between entrepreneurs and managers.*

Unit 2 – Business Ideas and their implementation

- *Discovering ideas and visualizing the business*
 - *Activity map*
 - *Business Plan*

Unit 3 – Idea to Start-up

- *Market Analysis – Identifying the target market,*
- *Competition evaluation and Strategy Development,*
 - *Marketing and accounting,*
 - *Risk analysis*

Unit 4 – Management

- *Company’s Organization Structure,*
- *Recruitment and management of talent.*
- *Financial organization and management*

Unit 5 - Financing and Protection of Ideas

- *Financing methods available for start-ups in India*
- *Communication of Ideas to potential investors – Investor Pitch*
 - *Patenting and Licenses*

Unit 6: *Exit strategies for entrepreneurs, bankruptcy, and succession and harvesting strategy*

Learning Outcome:

Upon completion of the course, the student will be able to demonstrate knowledge of the following topics:

1. *Understanding the dynamic role of entrepreneurship and small businesses*
2. *Organizing and Managing a Small Business*
3. *Financial Planning and Control*
4. *Forms of Ownership for Small Business*
5. *Strategic Marketing Planning*
6. *New Product or Service Development*
7. *Business Plan Creation*

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
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1.	<i>The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company</i>	Steve Blank and Bob Dorf	K & S Ranch ISBN – 978-0984999392
2.	<i>The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses</i>	Eric Ries	Penguin UK ISBN – 978-0670921607
3.	<i>Demand: Creating What People Love Before They Know They Want It</i>	Adrian J. Slywotzky with Karl Weber	Headline Book Publishing ISBN – 978-0755388974
4.	<i>The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business</i>	Clayton M. Christensen	Harvard business ISBN: 978-142219602

SUGGESTED SOFTWARE/LEARNING WEBSITES:

- b. <https://www.fundable.com/learn/resources/guides/startup>
- c. <https://corporatefinanceinstitute.com/resources/knowledge/finance/corporate-structure/>
- d. <https://www.finder.com/small-business-finance-tips>
- e. <https://www.profitbooks.net/funding-options-to-raise-startup-capital-for-your-business/>

Course Code	:	AUD-111
Course Title	:	Indian Constitution
Number of Credits	:	0 (L: 2, T:0; P:0)
Prerequisites (Course code)	:	None
Course Category	:	AU

Course Content

Unit 1 – The Constitution - Introduction

- The History of the Making of the Indian Constitution
- Preamble and the Basic Structure, and its interpretation
- Fundamental Rights and Duties and their interpretation
 - State Policy Principles

Unit 2 – Union Government

- Structure of the Indian Union
- President – Role and Power
- Prime Minister and Council of Ministers
 - Lok Sabha and Rajya Sabha

Unit 3 – State Government

- Governor – Role and Power
- Chief Minister and Council of Ministers
 - State Secretariat

Unit 4 – Local Administration

- District Administration
- Municipal Corporation
 - Zila Panchayat

Unit 5 – Election Commission

- *Role and Functioning*
- *Chief Election Commissioner*
- *State Election Commission*

Suggested Learning Resources:

S. No.	Title of Book	Author	Publication
1.	<i>Ethics and Politics of the Indian Constitution</i>	<i>Rajeev Bhargava</i>	<i>Oxford University Press, New Delhi, 2008</i>
2.	<i>The Constitution of India</i>	<i>B.L. Fadia</i>	<i>Sahitya Bhawan; New edition (2017)</i>
3.	<i>Introduction to the Constitution of India</i>	<i>DD Basu</i>	<i>Lexis Nexis; Twenty-Third 2018 edition</i>

Suggested Software/Learning Websites:

- <https://www.constitution.org/cons/india/const.html>
- <http://www.legislative.gov.in/constitution-of-india>
- <https://www.sci.gov.in/constitution>
- <https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/>

