

**AUXILIUM COLLEGE (Autonomous)**  
*(Accredited by NAAC with A+ Grade with a CGPA of 3.55 out of 4 in the 3rd Cycle)*  
**Gandhi Nagar, Vellore-632 006**

**Department of Computer Applications (B.C.A.) - (UG)**

**OUTCOME BASED EDUCATION - 2020**

(Effective for the Batch of Students Admitted from 2020-2021)

**II Year – SKILL BASED ELECTIVE**

**USCAA320 - SBE: ACCOUNTING SOFTWARE**

Year /Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
II / III	USCAA320	SBE: Accounting Software	Theory with Practical	Skill Based Elective	2	2	40+60

**COURSE OBJECTIVE**

1. To seamlessly combine the activities of accounting, inventory, payroll, finance and more.
2. To maintain a record of all monetary transactions.
3. To apply the knowledge of quantitative tools & techniques in the interpretation of data for managerial decision – making.
4. To develop computer skills of recording financial transactions, preparation of annual accounts and reports using Tally.
5. To acquaint with the accounting concept, tools and techniques influencing business organization.

**COURSE LEARNING OUTCOMES**

The Learners will be able to

1. Understand the basics in Tally and company creations
2. Creating vouchers, ledgers accounts, Balance Sheet
3. Demonstrate Profit And Loss Account and Reconciliation of the bank account.
4. Create company accounts that use various functions like Cost Category and Cost Centre
5. Learn to apply the tools & techniques in the interpretation of data for managerial decision – making.

CO/PO	PO					
	1	2	3	4	5	6
CO1	M	M	M	H	H	L
CO2	L	M	L	M	L	H
CO3	L	M	H	M	M	M

<b>CO4</b>	H	L	M	M	H	M
<b>CO5</b>	L	M	M	L	M	L

<b>CO/PSO</b>	<b>PSO</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>CO1</b>	H	M	H	M	H	L
<b>CO2</b>	L	H	M	H	H	L
<b>CO3</b>	H	L	H	H	M	M
<b>CO4</b>	M	M	H	H	L	H
<b>CO5</b>	H	H	L	M	M	H

**Low - L, Medium - M, High - H**

## **COURSE SYLLABUS**

### **Unit I**

**Hours: 5**

- 1.1 **Company Creation and Configuration** : Creation for New Company(K1,k2)
- 1.2 Company Features Accounting Features (K1,k2)
- 1.3 Inventory Features – Configuring Tally (K1,k2,k6)
- 1.4 Configuring Voucher Entry (k5,k6)
- 1.5 Configuring Invoice/Orders Entry – Shut A Company(k4,k5)
- 1.6 Alter a Company – Delete a Company(K4,k5)

### **Unit II**

**Hours: 5**

- 2.1 **Accounting and Inventory an Outline** : Fundamentals of Accounting – Accounting Terms Definitions – Ledger and Ledger Accounts (K2,K3)
- 2.2 Trial Balance – Trading and Profit and Loss Account (K1,K2)
- 2.3 Profit and Loss Account – Balance Sheet – Fundamentals of Inventory (K1, K2)
- 2.4 Accounts Masters Creation: Accounts Information – Group (Create, Display, Delete) Multiple Groups (K1,K2)
- 2.5 Ledgers (Create, Display, Alter) – Multiple Ledgers (K2, K4, K5)
- 2.6 Cost Categories – Cost Centres. (K5, K6)

### **Unit III**

**Hours: 6**

- 1.1 **Inventory Master Creation:** Stock Groups – Entering Vouchers (K1,K2,K4)
- 1.2 Voucher Types –Voucher Entry (K3, K4)
- 1.3 Different Types of Accounting Vouchers(Payment/Receipt, Journal, Sales , Purchase) (K2,K3,K4)
- 1.4 Reports In Tally: Display Balance Sheet – Profit And Loss Account (K3,K4,K5)
- 1.5 Display Trial Balance – Day Book (K2,K3,K4)
- 1.6 Reconciliation of Bank Accounts. (K5,K6)

**Unit IV****Hours: 6**

1. Trading , Profit and Loss Account of a Company
2. Balance Sheet of a Company
3. Cost Category and Cost Centre

**Unit V****Hours: 6**

4. Bank Reconciliation Statement
5. Inventory and Stock
6. Display and Reporting

**Books for Study:**

1. LP Computer Series - Guide To Tally 9 - Law Point, Kolkata, First Edition, 2007.

**Books for Reference:**

1. Tally for Beginners - Tally Press.

**SEMESTER V****UCCAR20 - Software Engineering**

Year /Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III / V	UCCAR20	Software Engineering	Theory	Core	5	3	40+60

**COURSE OBJECTIVES**

1. On learning this paper students will gain the knowledge of developing software with its techniques.
2. To identify the minimum requirements for the development of application.
3. To develop, maintain efficient, reliable and cost effective software solutions.
4. Ability to critically thinking and evaluate assumptions and arguments.
5. To analyze the test case design and test automation.

**COURSE LEARNING OUTCOMES**

The Learners will be able to

1. Apply the software engineering lifecycle by demonstrating competence in

- communication, planning, analysis, design, construction, and deployment.
2. Discuss the function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
  3. Manage the time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.
  4. Understand architectural design in order to minimize the risks and errors.
  5. Test the techniques for ensuring high quality software and Understand the capabilities of cost estimation.

CO/PO	PO					
	1	2	3	4	5	6
CO1	H	M	L	H	L	M
CO2	L	M	M	L	M	L
CO3	L	M	L	H	M	M
CO4	M	L	M	L	H	M
CO5	L	H	L	M	L	L

CO/PSO	PSO					
	1	2	3	4	5	6
CO1	H	M	M	H	H	L
CO2	M	H	L	M	H	M
CO3	L	M	H	H	L	M
CO4	H	L	H	H	M	L
CO5	L	H	M	H	L	M

**Low - L, Medium - M, High - H**

## **COURSE SYLLABUS**

### **Unit I**

**Hours: 15**

- 1.1 Introduction: Professional Software Development (K2)
- 1.2 Software Engineering Ethics (K1)
- 1.3 Software Process Model (K2)
- 1.4 Process Activities (K2)
- 1.5 Coping with Changes (K2)
- 1.6 Process Improvement (K2)

### **Unit II**

**Hours: 15**

- 2.1 Agile Software Development: Methods – Development Techniques (K2)
- 2.2 Scaling Agile Methods (K2)
- 2.3 Requirement Engineering: Functional and Non Functional Requirements (K2)

- 2.4 Requirement Engineering Processes – Requirements Elicitation (K2)
- 2.5 Requirements Specification (K2)
- 2.6 Requirements Validation and Changes (K2)

### **Unit III**

**Hours :15**

- 3.1 System Model: Context Models – Interaction Models (K2)
- 3.2 Structural Models (K2)
- 3.3 Behavioural Models (K2)
- 3.4 Architectural Design: Decisions - Views (K2)
- 3.5 Architectural Patterns (K2)
- 3.6 Application Architecture (K2)

### **Unit IV**

**Hours: 15**

- 4.1 Design and Implementation: Object-Oriented Design using the UML (K2)
- 4.2 Design Patterns – Implementation Issues (K2)
- 4.3 Software Testing: Development Testing (K2)
- 4.4 Test-Driven Development (K2)
- 4.5 Release Testing (K2)
- 4.6 User Testing (K2)

### **Unit V**

**Hours:15**

- 5.1 Software Evolution: Evolution Process (K1)
- 5.2 Legacy Systems (K2)
- 5.3 Software Maintenance (K2)
- 5.4 Dependable Systems (K2)
- 5.5 Dependability Properties (K2)
- 5.6 Sociotechnical Systems (K2)

### **Book for Study:**

1. Ian Sommerville, “Software Engineering”, Edition 10, Pearson Education, 2016.

### **Books for Reference:**

1. Roger S.Pressman, “Software Engineering: A Practitioner’s Approach”, Edition 7, McGraw Hill, New York, 2016.
2. Pankaj Jalote, “An Integrated Approach to Software Engineering”, Edition 3, Narosa Publication, 2018.

### **OER:**

1. [www.freebookcentre.net/SoftwareEng/Free-Software-Engineering-Books-Download.html](http://www.freebookcentre.net/SoftwareEng/Free-Software-Engineering-Books-Download.html)
2. <http://freecomputerbooks.com/softwareCategory.html>

## SEMESTER V

### UECAE20 - Elective II B: COMPUTER GRAPHICS

#### COURSE OBJECTIVES

Year/ Sem	Course Code	Title of The Course	Course Type	Course Category	H/W	Credits	Marks
III/ V	UECAE20	Elective II B: Computer Graphics	Theory	Elective	5	3	40+60

1. Understand two dimensional graphics and their transformations.
2. Gain knowledge about graphics hardware devices and software used.
3. Understand three dimensional graphics and their transformations and to become familiar with clipping techniques.
4. To understand the importance of visual representation.
5. To design 2D and 3D techniques for graphics.

#### COURSE LEARNING OUTCOMES

The Learners will be able to

1. Understand the basic objectives and scope of computer graphics
2. To acquire knowledge on graphics hardware devices and software used.
3. Implement various algorithms to scan, convert the basic geometrical primitives, Transformations, Area filling, clipping.
4. Understand the concepts of and techniques used in 2D and 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture
5. Understand the concepts of computer graphics, including viewing, projection, Perspective, modeling and transformation in two and three dimensions.

CO/PO	PO					
	1	2	3	4	5	6
CO1	M	H	L	M	M	M
CO2	H	L	M	M	M	L
CO3	M	M	L	L	M	H
CO4	M	L	M	M	L	L
CO5	H	M	L	H	M	M

CO/PSO	PSO					
	1	2	3	4	5	6
CO1	H	L	H	H	M	H
CO2	L	H	L	H	M	L
CO3	M	M	M	L	H	M
CO4	H	L	L	M	L	M

CO5	H	M	L	H	M	M
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**Low -L, Medium -M, High-H**

## **COURSE SYLLABUS**

### **Unit I**

**Hours: 15**

- 1.1 Overview of graphics Systems: Video Display Device (K1, K2, K3)
- 1.2 Raster Scan Displays and Random Scan Displays (K1, K2, K3)
- 1.3 Graphics Monitor and Workstation (K1, K2)
- 1.4 Input Devices (K1, K2)
- 1.5 Hard Copy Devices (K1, K2)
- 1.6 Graphics software (K1, K2)

### **Unit II**

**Hours: 15**

- 2.1 Output Primitives: Points and Lines (K1, K2, K3)
- 2.2 Line Drawing Algorithms: DDA Algorithms and Bresenham's Line Algorithm (K1, K2, K3, K4)
- 2.3 Circle generating Algorithm (K1, K2, K3, K4)
- 2.4 Attributes of Output Primitives: Line Attributes (K1, K2, K3)
- 2.5 Area-Fill Attributes (K1, K2, K3)
- 2.6 Character Attributes (K1, K2, K3)

### **Unit III**

**Hours: 15**

- 3.1 Two Dimensional Geometric Transformation: Basic Transformations (K1, K2, K3)
- 3.2 Matrix Representations and Homogeneous Coordinates (K1, K2, K3)
- 3.3 Composite Transformations (K1, K2, K3)
- 3.4 Other Transformations Reflections (K1, K2, K3)
- 3.5 Two Dimensional Viewing: Viewing Pipeline (K1, K2, K3)
- 3.6 Window to Viewport Coordinate Transformation (K1, K2, K3)

### **Unit IV**

**Hours: 15**

- 4.1 Clipping Operations - Point Clipping (K1, K2, K3)
- 4.2 Line Clipping: Cohen-Sutherland Line Drawing Algorithm (K1, K2, K3)
- 4.3 Polygon Clipping: Sutherland Hodgeman Polygon Clipping (K1, K2, K3)
- 4.4 Curve Clipping - Text Clipping - Exterior Clipping (K1, K2, K3)

4.5 Input of Graphical Data Logical Classification of Input Devices (K1, K2, K3)

4.6 Interactive Picture Construction Techniques (K1, K2, K3)

## Unit V

Hours: 15

5.1 **Three Dimensional Concepts: Three Dimensional** Display methods - Parallel projection (K1, K2, K3)

5.2 Perspective Projection (K1, K2, K3)

5.3 Depth Cueing - Visible Line and Surface Identification (K1, K2, K3)

5.4 Three Dimensional Geometric and modeling Transformations: Translation – Rotation and Scaling (K1, K2, K3)

5.5 Other Transformations (K1, K2, K3)

5.6 **Three Dimensional Viewing: Projections** (K1, K2, K3)

### Books for Study:

1. Donald Hearn, M. Pauline Baker, “Computer Graphics”, 2<sup>nd</sup> Edition, Prentice Hall of India Publication, 2011.
2. Donald Hearn, M. Pauline Baker Warren Carithers, “Computer Graphics with Open GL”, 4<sup>th</sup> Edition, Pearson Publication, 2014.

### Books for Reference:

1. Apurva A. Desai - “Computer Graphics”, 1<sup>st</sup> Edition, Prentice Hall of India Publication, 2008.
2. ISRD Group - “Computer Graphics”, Second Edition, McGraw Hill Book Company, 2008.

### OER:

1. <http://freecomputerbooks.com/specialcompscGraphBooks.html>

## SEMESTER VI

### UECAF20- Elective - III A: Mobile Computing

Year /Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III / VI	UECAF20	Elective - III A: Mobile Computing	Theory	Elective	5	3	40+60

### COURSE OBJECTIVES

1. To understand the basic concepts of mobile computing.
2. To be familiar with the network layer protocols and AdHoc networks.
3. To know the basis of transport and application layer protocols.
4. To gain knowledge about different mobile platforms and application development.



5. Understand fundamentals of wireless communications. Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.

## COURSE LEARNING OUTCOMES

The Learners will be able to

1. Understand the basic concepts of mobile computing.
2. Expand the network layer protocols and AdHoc networks.
3. Apply the basis of transport and application layer protocols.
4. Develop knowledge about different mobile platforms and application development.
5. Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.

CO/PO	PO					
	1	2	3	4	5	6
CO1	H	L	M	M	L	M
CO2	L	M	L	M	H	H
CO3	L	M	M	L	M	M
CO4	M	H	M	L	M	H
CO5	H	M	M	H	L	M

CO/PSO	PSO					
	1	2	3	4	5	6
CO1	H	L	L	H	M	H
CO2	L	H	L	L	M	L
CO3	M	H	M	L	H	M
CO4	M	L	H	M	L	M
CO5	H	L	L	H	M	L

Low - L, Medium - M, High - H

## COURSE SYLLABUS

### Unit I

Hours: 15

- 1.1 Introduction to Mobile Computing (K1)
- 1.2 Applications of Mobile Computing (K2, K3, K4)
- 1.3 Generations of Mobile Communication Technologies (K1, K2, K3)
- 1.4 Multiplexing (K1, K2, K3, K4)
- 1.5 Spread spectrum (K1, K2, K3)

1.6 MAC Protocols – SDMA- TDMA- FDMA- CDMA (K1, K2, K3, K4)

## **Unit II**

**Hours: 15**

- 2.1 Introduction to Cellular Systems (K1, K2, K3, K4)
- 2.2 GSM – Services & Architecture – Protocols (K1, K2, K3)
- 2.3 Connection Establishment (K1, K2, K3)
- 2.4 Frequency Allocation – Routing (K1, K2, K3)
- 2.5 Mobility Management – Security (K1, K2, K3, K4)
- 2.6 GPRS- UMTS – Architecture – Handover – Security (K1, K2)

## **Unit III**

**Hours: 15**

- 3.1 Mobile IP – DHCP – AdHoc (K1, K2, K3)
- 3.2 Proactive protocol-DSDV (K1, K2, K3)
- 3.3 Reactive Routing Protocols – DSR, AODV Hybrid routing –ZRP (K1,K2)
- 3.4 Multicast Routing- ODMRP (K1, K2, K3, K4)
- 3.5 Vehicular Ad Hoc networks ( VANET) (K1, K2, K3, K4)
- 3.6 MANET Vs VANET – Security (K1, K2, K3, K4)

## **Unit IV**

**Hours: 15**

- 4.1 Mobile TCP (K1, K2, K3)
- 4.2 WAP – Architecture (K2, K3, K4)
- 4.3 WDP – WTLS (K2,K3)
- 4.4 WTP –WSP (K2,K3)
- 4.5 WAE – WTA Architecture (K2,K3)
- 4.6 WML (K2,K3)

## **Unit V**

**Hours: 15**

- 5.1 Mobile Device Operating Systems (K1, K2)
- 5.2 Special Constraints & Requirements (K1, K2)
- 5.3 Commercial Mobile Operating Systems (K1, K2, K3)
- 5.4 Software Development Kit: iOS, Android, BlackBerry, Windows Phone (K1, K2, K3)
- 5.5 M-Commerce – Structure – Pros & Cons (K1, K2)
- 5.6 Mobile Payment System – Security Issues (K1, K2)

### **Book for Study:**

1. Prasant Kumar Pattnaik, Rajib Mall, “Fundamentals of Mobile Computing”, Second Edition, PHI Learning Pvt. Ltd, New Delhi, 2012.

### **Books for Reference:**

1. Jochen H. Schller, “Mobile Communications”, Second Edition, Pearson Education, New Delhi, 2007.
2. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile Systems", Fourth Edition, Thomson Asia Pvt Ltd, 2017.
3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Second Edition, Springer, 2007.

**OER:**

1. <https://www.bookganga.com/eBooks/Books/details/4855549396506651616?BookName=Mobile-Computing>.
1. [https://www.tutorialspoint.com/cloud\\_computing/cloud\\_computing\\_tutorial.pdf](https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf)

**SEMESTER VI****UECAG20 – ELECTIVE – III B: ARTIFICIAL INTELLIGENCE**

Year /Sem	Course Code	Title of the Course	Course Type	Course Category	H/W	Credits	Marks
III / VI	UCCAG20	ELECTIVE III B: Artificial Intelligence	Theory	Elective	5	3	40+60

**COURSE OBJECTIVES**

1. Gain a historical perspective of AI and its foundations.
2. Become familiar with basic principles of AI toward problem solving inference, perception, knowledge representation, and learning.
3. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
4. To understand the concept of learning techniques.
5. To know about Context Free Grammars.

**COURSE LEARNING OUTCOMES**

The Learners will be able to

1. Understanding different types of AI Agents and its Environments.
2. Know Various AI Search Algorithms (uninformed, informed, heuristic search).
3. Understand the fundamentals of Knowledge representation (logic based, frame based).
4. Understand the different types of Learning.
5. Ability to apply knowledge representation, reasoning , and machine learning Techniques

CO/ PO	PO					
	1	2	3	4	5	6
CO1	M	L	M	L	H	M
CO2	L	M	M	H	M	L
CO3	M	M	H	M	L	M
CO4	H	L	M	M	H	M

<b>CO5</b>	M	L	M	L	M	L
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<b>CO/PSO</b>	<b>PSO</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>CO1</b>	H	L	M	H	M	H
<b>CO2</b>	L	M	L	M	M	L
<b>CO3</b>	M	H	M	L	H	M
<b>CO4</b>	H	L	H	L	L	M
<b>CO5</b>	H	H	L	M	M	H

**Low -L, Medium -M, High-H**

## **COURSE SYLLABUS**

### **Unit I**

**Hours: 15**

- 1.1 Artificial Intelligence- Introduction- Foundation of Artificial Intelligence. (K1, K2)
- 1.2 History of Artificial Intelligence- Intelligent Agents- Agents and Environment. (K1, K2, K3)
- 1.3 Good Behavior- The Concept of Rationality- Performance Measures- Rationality. (K1, K2, K3)
- 1.4 Problem Solving- Solving Problem by searching- Problem Solve Agents. (K1, K2, K3, K4)
- 1.5 Well Defined Problems and Solutions- Formulating Problems. (K1, K2, K3, K4)
- 1.6 Uniformed Search Strategies- Breadth First Search- Depth First Search. (K1, K2, K3, K4)

### **Unit II**

**Hours: 15**

- 1.1 Informed Search- Greedy Best First Search- A\* Search Minimizing the total estimated Solution Cost. (K1, K2, K3, K4)
- 1.2 Hill Climbing Search- Genetic Algorithm. (K1, K2, K3, K4)
- 1.3 Local Search in Continuous space- Online Search Agents and Unknown environments - Online Search problems- Online Search Agents. (K1, K2, K3, K4)
- 1.4 Online Local Search- Learning in Online Search. (K1, K2, K3, K4)
- 1.5 Constraint Satisfaction Problems- Backtracking Search for CSPS. (K1, K2, K3, K4)
- 1.6 Backtracking and Local Search. (K1, K2, K3, K4)

### **Unit III**

**Hours: 15**

- 1.1 Logical Agents- Knowledge Based Agents. (K1, K2, K3)
- 1.2 Logic - Propositional Logic A Very simple logic. (K1, K2, K3)
- 1.3 Reasoning Pattern in Propositional Logic- Resolution Forward and Backward Chaining. (K1, K2, K3)
- 1.4 Syntax and Semantics of First order Logic- Models for First Order Logic. (K1, K2, K3)
- 1.5 Symbol and Interpretations- Terms. (K1, K2)
- 1.6 First Order Logic- Assertions and queries in First order Logic. (K1, K2, K3)

**Unit IV****Hours: 15**

- 1.1 Learning from Observations- Forms of Learning. (K1, K2)
- 1.2 Inductive Learning- Knowledge in Learning- A logical Formulation of Learning. (K1, K2)
- 1.3 Examples and hypotheses- Current best hypothesis search. (K1, K2, K3)
- 1.4 Least Commitment Search- Explanation Based Learning- Extracting General rules from Examples. (K1, K2)
- 1.5 Improving Efficiency- Learning using Relevance Information. (K1, K2)
- 1.6 Inductive Logic Programming- An Example Top down inductive Learning Methods- Inductive learning with inverse deduction. (K1, K2)

**Unit V****Hours: 15**

- 5.1 Communication –Communication as Action- Fundamentals of Language. (K1, K2)
- 5.2 Formal Grammar for a Fragment of English- Lexicon of  $\epsilon_0$ - Grammar of  $\epsilon_0$ . ((K1, K2, K3)
- 5.3 Syntactic Analysis Parsing- Efficient Parsing. (K1, K2, K3, K4)
- 5.4 Augmented Grammars- Semantic Interpretation. (K1, K2, K3, K4)
- 5.5 The semantics of a English Fragment- Time and Tense- Quantification- Pragmatic Interpretation. (K1, K2, K3, K4)
- 5.6 Languages and generation with DCG'S- Ambiguity and Disambiguation. (K1, K2, K3)

**Books for Study:**

1. Stuart Russel Peter Norvig, “Artificial Intelligence- A Modern Approach” Second Edition Pearson Education/ Prentice Hall of India 2010.

**Books for Reference:**

1. Nils J.Nilsson,” Artificial Intelligence: A new Synthesis”,First Edition, Harcourt Asia Pvt.Ltd.,1998.
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Third Edition, Tata McGraw Hill, 2017.
3. George F.Luger “Artificial Intelligence Structures and Strategies for Complex Problem solving”, Third Edition, Pearson Education/PHI 1997.

**OER:**

1. [https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.cin.ufpe.br/~tf12/artificial-intelligence-modern-approach.9780131038059.25368.pdf&ved=2ahUKEwi9\\_rSJrHrAhUHxzgGHh\\_iCSgQFjAAegQIAxAB&usq=AOvVaw0Ba2OoXSI4QuGW-AzLXmx1](https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.cin.ufpe.br/~tf12/artificial-intelligence-modern-approach.9780131038059.25368.pdf&ved=2ahUKEwi9_rSJrHrAhUHxzgGHh_iCSgQFjAAegQIAxAB&usq=AOvVaw0Ba2OoXSI4QuGW-AzLXmx1)