# Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, CHHATRAPATI SAMBHAJINAGAR.

## NAAC- 'A +' Grade

### CIRCULAR NO.SU/AEDP/ Basket/ Deptt./90/2025

It is hereby inform to all concerned that, recommended by the Board of Deans, the Academic Council at its meeting held on 09 May 2025 has been accepted *the Basket of Generic/Open Elective (GE/OE) For Apprenticeship Embedded Degree Programme (AEDP) to Ist and IInd semester* under the Faculty of Science & Technology, Faculty of Commerce and Management and Faculty of Humanities run at the University Department of Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar as appended herewith. This is effective from the Academic Year 2025-26 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Chhatrapati Sambhajinagar
-431 004.
REF.NO. SU/SCI./2025/993-102
Date:- 12/ 06 /2025.

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**Deputy Registrar,
Syllabus Section.**

**Copy forwarded and necessary action to :-**

1] **The Head, All Concern Department,**

2] The Director, Board of Examinations & Evaluation,

3] The Director, University Network & Information Centre, UNIC,

   **with a request to upload this Circular on University Website.**

   Dr. Babasaheb Ambedkar Marathwada University,

   Chhatrapati Sambhajinagar.

   **Copy to :-**

1] PA to the Hon'ble Vice-Chancellor,

2] PA to the Pro. Vice-Chancellor,

3] PA to the Registrar,

   Dr. Babasaheb Ambedkar Marathwada University,

   Chhatrapati Sambhajinagar.

JD*12062025/-                    -=**=-

# DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, CHHATRAPATI SAMBHAJINAGAR

## Basket

## Generic / Open Elective (GE/OE) For

## Apprenticeship Embedded Degree Program ( AEDP)

## Ist and IInd semester

## Run at University Campus Only

## From the Academic Year 2025-26 & Onwards.

# Dr. Babasaheb Ambedkar Marathwada University,

## Chhatrapati Sambhajinagar (MS)

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## Generic / Open Elective (GE/OE) Basket for AEDP UG Programme

### (for the first year of Apprenticeship Embedded Degree Program ( AEDP) running in the main campus of Dr. Babasaheb Ambedkar Marathwada University)

**Note:**

1) Student will have to choose any one course from the following Basket in each semester.

2) While selecting course, students will have to choose the course from other faculty (the faculty other than his / her Major). For example, the students from faculty of Science and Technology can choose any one course in each semester either from i) Faculty of Commence and Management OR ii) faculty of Humanities. Students from faculty of Commence and Management can choose any one course in each semester either from i) Faculty of Science and Technology OR ii) faculty of Humanities. Similarly the students from faculty of Humanities can choose any one course in each semester either from i) Faculty of Science and Technology OR ii) faculty of Commence and Management.

| Names of the Department | Faculty | Semester | Title of the Course |
|---|---|---|---|
| Department of Electronics | Faculty of Science and Technology | 1st | GE/OE-1 : Introduction to Electronics and Everyday Technology |
| | | 2nd | GE/OE-2 : Introduction to DIY Solar & Smart Tech for Everyday Life |
| Department of Computer Science and IT | | 1st | GE/OE-1 : Introduction to Computing for Behavioral Sciences |
| | | 2nd | GE/OE-2 : Data Analysis for Psychology |
| Department of Management Science | Faculty of Commerce and Management | 1st | GE / OE -1 : C++ Programming |
| | | 2nd | GE / OE - 2: Organisational Behaviour |
| Department of Psychology | Faculty of Humanities | 1st | GE/OE-1: Personality Development |
| | | 2nd | GE/OE-2 : Stress Management |

# Syllabus of the courses offered by Department of Electronics

## Semester – I

## GE-OE-1 : Introduction to Electronics and Everyday Technology

**(This course will be available for the students other than faculty of Science and Technology)**

**Credit: 2**                                                    **Total Contact Hours:** 30 Hours

Marks: 50

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**Target Audience**

Students from **Faculty of Humanities** and **Faculty of Commerce and Management**, with **no prior background in electronics.**

**Course Objectives**

- To introduce the basic concepts of electronics in a non-technical, application-driven manner
- To make students aware of the role of electronics in everyday life and professional settings
- To promote technological literacy and confidence in using electronic tools and systems

**Course Outcomes**

By the end of this course, students will be able to:

i)    **Recognize and describe** the basic components and principles of electronics as they appear in everyday life and common devices.
      *(Level: Knowledge & Comprehension)*

ii)   **Identify and explain** the working of popular electronic gadgets such as mobile phones, remotes, chargers, and kitchen appliances.
      *(Level: Comprehension & Application)*

iii)  **Differentiate** between electrical and electronic systems and understand the concepts of analog and digital signals using simple examples.
      *(Level: Understanding)*

iv)   **Appreciate** the role of electronics in professional fields such as commerce, media, event management, and office environments.
      *(Level: Awareness & Application)*

v)    **Demonstrate awareness** of current trends in consumer electronics (e.g., IoT, wearable tech, smart devices) and their societal impact.
      *(Level: Awareness & Evaluation)*

vi)   **Understand and adopt** safe, responsible, and sustainable practices in the use and disposal of electronic devices.
      *(Level: Application & Ethical Practice)*

vii)  **Explore and identify** further learning opportunities, certifications, and career pathways involving electronics and digital technologies.
      *(Level: Awareness & Lifelong Learning)*

**Course Modules**

## Module 1: Basics of Electronics and Electronics in Everyday Life (10 Hours)

- What is Electronics? Importance in daily life
- Difference between Electrical and Electronic devices
- Basic components: Resistors, Capacitors, Diodes, Transistors (simple visuals & analogies)
- Understanding circuit symbols and simple circuits
- How common gadgets work: mobile phones, chargers, remotes, TVs, kitchen appliances
- Sensors in daily life: motion sensors, gas sensors, temperature sensors
- Smart home technologies and automation basics

## Module 2: Electronic Devices and Digital World Essentials (10 Hours)

- Inside a smartphone, computer, and smartwatch: simplified hardware tour
- Batteries, power banks, and chargers
- Importance of PCBs and microcontrollers (basic intro only)
- Introduction to digital vs. analog signals
- Microcontrollers and their role in automation
- Introduction to Internet of Things (IoT) through real-life examples (e.g., smart water meter, smart fridge)

## Module 3: Technology, Safety and Electronics in Business and Creative Arts (10 Hours)

- E-waste and electronics recycling
- Safe handling of electronic devices
- Responsible use of gadgets (screen time, privacy, health)
- Use of electronics in media, advertising, and event management
- Applications in banking (ATMs, PoS), inventory management, and office automation
- Digital audio/video equipment and electronic publishing tools
- Trends: AI gadgets, wearable tech, smart cities
- Career awareness: Electronics in creative and business professions
- Upskilling pathways (MOOCs, certifications)

**Reference Books**

1) Electronics for Beginners: A Practical Introduction to Schematics, Circuits, and Microcontrollers; Author: Jonathan Bartlett
   Publisher: No Starch Press
2) Make: Electronics – Learning Through Discovery (2nd Edition)      Author: Charles Platt
   Publisher: Maker Media

3) Exploring Arduino: Tools and Techniques for Engineering Wizardry; Author: Jeremy Blum ; Publisher: Wiley
4) Everyday Technology Explained; Author: John Miller ; Publisher: Readers Digest Association
5) Digital Literacy and Everyday Life; Authors: Ellen Helsper & Alexander J. A. M. van Deursen; Publisher: Palgrave Macmillan
6) Understanding Smart Sensors" (3rd Edition); Author: Randy Frank
   Publisher: Artech House
7) Consumer Electronics; Author: S. P. Bali
   Publisher: Pearson Education

## Semester II

## GE/OE-2: Introduction to DIY Solar & Smart Tech for Everyday Life

**(This course will be available for the students other than faculty of Science and Technology)**

2 Credit                                                        Contact Hours: 30

Marks: 50

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Target Audience

Undergraduate students from the **Faculty of Humanities** and **Faculty of Commerce and Management** with **no prior background in electronics or engineering**.

Course Objectives

- Introduce the basic principles and advantages of solar energy.
- Identify essential components of small-scale solar power systems.
- Enable students to design and conceptualize a DIY solar energy setup.
- Explain the functioning of simple sensors and actuators in energy-efficient systems.
- Guide students to build and simulate basic smart control circuits.
- Encourage adoption of smart, low-cost, and sustainable technologies for daily life.

Course Outcomes (COs)

By the end of this course, students will be able to:

1. **CO1:** Describe the principles of solar energy and its applications in everyday life.
2. **CO2:** Identify and explain the roles of key components in a basic solar energy system.
3. **CO3:** Design and estimate a low-cost, functional DIY solar system for a small-scale use case.
4. **CO4:** Explain the function of common sensors and actuators used in energy-efficient systems.
5. **CO5:** Develop simple automation circuits for lighting, temperature control, and safety using sensors.
6. **CO6:** Apply concepts of smart energy and sustainability in practical scenarios at home or office.

Course Content and Unit-Wise Breakdown

## Unit 1: Solar Energy Basics & Smart Energy Us  ( 10 Hours)

- What is solar energy? Benefits and global relevance.
- Difference between renewable and non-renewable sources.
- The Photovoltaic (PV) effect: simplified explanation.
- Common solar gadgets: lamps, chargers, fans, garden lights.

- Introduction to smart energy use: timers, motion sensors, LED efficiency.

## Unit 2: DIY Solar Home System Design ( 10 Hours)

- Solar panel types (monocrystalline, polycrystalline) and placement.
- Battery types: lead-acid vs lithium-ion and their pros/cons.
- Charge controllers: role in regulating power.
- Inverters: converting DC from panel to usable AC.
- Connecting a basic solar system: panel → controller → battery → inverter → load.

## Unit 3: Smart Control Using Sensors & Actuators ( 10 Hours)

- Sensors overview: IR, ultrasonic, temperature, light, door sensors.
- Actuators overview: motors, relays, smart switches.
- Smart home applications:
  - Motion-detected lighting.
  - Temperature-controlled fans.
  - Security alerts and alarms.
- Combining solar power with automation.

Recommended Reference Books & Resources

1. **Solar Energy: The Physics and Engineering of Photovoltaic Conversion, Technologies and Systems**
   – Olindo Isabella, Arno Smets, Klaus Jäger
2. **Designing with Solar Power: A Source Book for Building Integrated Photovoltaics (BIPV)**
   – Deo Prasad and Mark Snow
3. **Make: Electronics: Learning Through Discovery**
   – Charles Platt
4. **Practical Arduino: Cool Projects for Open Source Hardware**
   – Jonathan Oxer & Hugh Blemings
5. **Smart Homes and Their Users**
   – Springer Series: Human–Computer Interaction
6. **Solar Electricity Handbook – 2024 Edition**
   – Michael Boxwell
7. **Open-source platforms like Tinkercad Circuits** (for simulation) and **Arduino IDE tutorials** (for beginners).
8. **NPTEL & SWAYAM Resources:**
   - Basics of Solar Energy
   - Introduction to Sensors and IoT

# Syllabus of the courses offered by Department of Computer Science and IT

## GE-OE-1 Introduction to Computing for Behavioural Sciences

**(This course will be available for the students other than faculty of Science and Technology)**

**Credit: 2**                                **Total Contact Hours:** 30 Hours

Marks: 50

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**Target Audience**

Students from **Faculty of Humanities** and **Faculty of Commerce and Management**, with **no prior background in Computing**

**Course Objectives:**

- Understand core computing principles relevant to behavioural science research.
- Explain digital data structures, storage, and ethical issues in data management.
- Interpret how computing tools support survey research, experiment design, and data analysis.
- Gain foundational knowledge of programming logic, data formats, and digital workflows in behavioural research.

Course Outcomes (COs)

By the end of this course, students will be able to:

- **CO1:** Understand the fundamental concepts of computing, data representation, and the role of computing in behavioural sciences.
- **CO2:Explain** the role of computing in behavioural sciences, including key concepts like algorithms, data structures, and automation
- **CO3:** Apply basic programming concepts to solve problems relevant to behavioural data analysis.
- **CO4:** Utilize software tools and computational techniques for data organization, visualization, and interpretation in psychological and behavioural studies.
- **CO5:** Analyse and interpret behavioural data using statistical computing environments.
- **CO6:** Demonstrate the ability to design and implement simple computational models to study behavioural phenomena.
- **CO7:** Critically evaluate the ethical considerations in the use of computing technologies in behavioural sciences.

**Course Modules**

**Module 1: Computing Foundations for Behavioural Science (10 Hours)**

- What is computing? Computer vs. human cognitive processes
- Evolution of computing in behavioural sciences
- Overview of hardware and software systems
- Nature and types of data: nominal, ordinal, interval, ratio
- Data sources: observations, surveys, digital footprints
- Formats: text, numeric, tabular, structured and unstructured data
- File organization: folders, naming conventions, metadata
- Common file types in psychology research: CSV, XLSX, TXT
- Local vs cloud storage (Google Drive, Dropbox, OneDrive)

**Module 2: Fundamentals of Algorithms, Logic and Programming (10 Hours)**

- Algorithms: flow of instructions
- Logical operators and control flow: if-else, loops
- Conceptual modeling of simple psychological experiments (e.g., Stroop task)
- Basic elements: variables, data types, expressions
- Working with data collections
- Examples using psychological concepts: e.g., storing reaction times
- Basics of data visualization
- Graph types and their psychological application (bar, line, histogram)
- Understanding data patterns and behavior through visual summaries

**Module 3: Use of Computing in Behavioural Science Research, Digital Ethics and Data Privacy (10 Hours)**

- Behavioral experiments and digital tools
- Simulation in cognitive psychology
- Intro to software used in research labs (e.g., PsychoPy, OpenSesame)
- Informed consent and digital data
- Anonymity, confidentiality, data protection
- Overview of GDPR and data ethics in behavioral research

## Reference Books:

1. Van Dierendonck, D. (2020). *Psychological Data Science: Understanding and Using Data in Behavioral Research*. Routledge.

2. Downey, A. B. (2015). *Think Python: How to think like a computer scientist* (2nd ed.). O'Reilly Media.

3. Miller, J. H., & Page, S. E. (2007). *Complex adaptive systems: An introduction to computational models of social life*. Princeton University Press.

4. Brysbaert, M. (2019). How to use PsychoPy for research. Cambridge University Press.

## Semester - II

## GE-OE-2 Data Analysis for Psychology

**(This course will be available for the students other than faculty of Science and Technology)**

**Credit: 2**                                            **Total Contact Hours:** 30 Hours

Marks: 50

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**Target Audience**

Students from **Faculty of Humanities** and **Faculty of Commerce and Management**, with **no prior background in Computing**

**Course Objectives:**

- Understand core computing principles relevant to behavioural science research.
- Explain digital data structures, storage, and ethical issues in data management.
- Interpret how computing tools support survey research, experiment design, and data analysis.
- Gain foundational knowledge of programming logic, data formats, and digital workflows in behavioural research.

Course Outcomes (COs)

By the end of this course, students will be able to:

- **CO1:Define and explain** core statistical concepts (e.g., p-values, effect sizes, confidence intervals) in psychological research.
- **CO2:Clean and prepare** raw psychological data (e.g., survey responses, experimental results) for analysis.
- **CO3:Conduct** descriptive and inferential statistics using software SPSS/JASP/R/Python).
- **CO4:Visualize data** effectively using APA-compliant graphs (bar charts, scatterplots, error bars).
- **CO5:Evaluate** the appropriateness of statistical methods in published psychology studies.
- **CO6:Interpret** statistical results in plain language
- **CO7:Discuss** the societal impact of algorithmic bias in psychological tools

**Course Modules**

**Module 1: Foundations of Psychological Data Analysis(10 Hours)**

- **Research Design & Data Types**(Experimental vs. correlational designs)
- Levels of measurement (nominal, ordinal, interval, ratio)

- **Descriptive Statistics**(Measures of central tendency & variability
- Data distributions (normal, skewed)
- **Data Cleaning & Preparation**(Handling missing data, outliers
- Recoding variables, reverse-scoring surveys
- **Statistical Software Basics**(Introduction to SPSS/JASP (GUI)

## Module 2: Probability, Sampling and Hypothesis formulation (10 Hours)

- Introduction to probability and sampling
- Hypothesis Testing: t-tests (independent, paired), ANOVA (one-way, factorial)
- Effect sizes (Cohen's d, $\eta^2$) and power analysis

## Module 3: Inferential Statistics (10 Hours)

- Correlation & Regression: Pearson's r, Spearman's rho, Linear regression (predicting outcomes)
- Non-Parametric Tests: Chi-square, Mann-Whitney U, Wilcoxon signed-rank
- Data Visualization: Creating APA-style graphs (bar charts, scatterplots) software like PsychoPy. JASP. Ethical considerations in data analysis

## Reference Books :

1. Navarro, D. J., & Foxcroft, D. R. (2022). *Learning statistics with JASP: A tutorial for psychology students and other beginners.* https://learnstatswithjasp.com/

2. Cumming, G. (2012). *Understanding the new statistics: Effect sizes, confidence intervals, and meta-analysis.* Routledge.

3. Gravetter, F. J., & Wallnau, L. B. (2021). *Statistics for the behavioral sciences (11th ed.).* Cengage Learning.

4. Coolican, H. (2018). *Research methods and statistics in psychology (7th ed.).* Psychology Press.

# Syllabus of the courses offered by Department of   Management Science

# GE/OE-1: C++ Programming

**(This course will be available for the students other than faculty of Commerce and Management)**

**Credits**: 2        **Total Contact Hours**: 30 Hours

**Marks**: 50

## Target Audience

Undergraduate students from faculty of **Science and Technology** and **Faculty of Humanities**

## Course Objectives

- To introduce the fundamentals of C++ programming to beginners.
- To enable students to write and debug simple C++ programs.
- To promote structured problem-solving using data types, arrays, and functions in C++.

## Course Outcomes

By the end of this course, students will be able to:

1. **CO1**: Understand basic concepts of C++ programming language.
2. **CO2**: Write, compile, and execute C++ programs using IDEs and compilers.
3. **CO3**: Implement arrays, functions, and pointers to solve practical problems.

## Course Modules

**Module 1: Introduction to C++ and Programming Basics (10 Hours)**

- IDE/compiler setup and source code structure
- Syntax, keywords, variables, and tokens
- Data types, operators, and statements (if, switch, for, while, do-while)
- User input and program execution flow

**Module 2: Arrays, Pointers, and Functions (10 Hours)**

- Array types, declaration, and initialization

- Pointers: concept, use-cases, and examples
- Functions: call by value/reference, recursion, nested functions
- Passing arrays and function pointers

## Module 3: Structures, Unions, and File Handling (10 Hours)

- Defining and using structures and unions
- Memory organization and passing structures to functions
- File I/O using ofstream, ifstream, and fstream
- Creating object arrays, using structures in programs

## Recommended Textbooks

1. Stroustrup, B. *The C++ Programming Language*
2. Kanetkar, Y. *Let Us C++*
3. Schildt, H. *C++: The Complete Reference*, 4th Edition

# Semester II

## GE/OE-2: Organizational Behavior

**(This course will be available for the students other than faculty of Commerce and Management)**

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**Credits**: 2

**Total Contact Hours**: 30 Hours

**Marks**: 50

## Target Audience

Undergraduate students from **Faculty of Science and Technology** and **Faculty of Humanities**.

## Course Objectives

- To introduce foundational principles of organizational behavior.
- To explore individual and group dynamics within organizations.
- To help students develop insights into leadership and organizational culture.

## Course Outcomes

By the end of this course, students will be able to:

1. **CO1**: Understand the fundamentals of organizational behavior and its relevance to performance.
2. **CO2**: Analyze individual behavior, perception, motivation, and personality at work.
3. **CO3**: Examine group behavior, team dynamics, and conflict resolution strategies.
4. **CO4**: Apply principles of leadership and organizational culture in real-world contexts.

## Course Modules

### Module 1: Fundamentals of Organizational Behavior (10 Hours)

- Definition, scope, and importance in modern workplaces
- Models of OB, emerging challenges and opportunities

### Module 2: Individual & Group Dynamics (10 Hours)

- Personality traits, perception process, job satisfaction
- Motivation theories: Maslow, Herzberg, McGregor
- Group vs. team behavior, group norms, roles
- Conflict types, sources, and resolution techniques

### Module 3: Leadership & Organizational Culture (10 Hours)

- Leadership styles and theories: Trait, Behavioral, Contingency
- Power and politics in organizations
- Types and elements of organizational culture
- Change management and innovation

## Recommended Textbooks

1. Robbins, S.P. *Organizational Behavior*, Pearson Education
2. Aswathappa, K. *Organizational Behavior*, Himalaya Publishing

## Additional References

- Robbins, S.P. *Essentials of Organizational Behavior*
- Luthans, F. *Organizational Behavior*, McGraw Hill
- Pareek, U. *Understanding Organizational Behavior*, Oxford University Press

# Syllabus of the courses offered by Department of Psychology

## GE/OE-1 : Personality Development.

**(This course will be available for the students other than faculty of Humanities)**

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Total Credits: 02                                    Total Contact Hours: 30 Hrs
Maximum Marks : 50

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**Learning Objectives of the Course:**

i)      **Understanding Personality**
ii)     **Acquire Knowledge of Self**
iii)    **Learn methods of developing personality**

**Course Outcomes (COS):**

After completion of the course, students will be able to

i)   **Understand personality**
ii)  **Will have Self- knowledge**
iii) **Take action for personality development**

| Module No. | Topics / actual contents of the syllabus | Contact Hours |
|---|---|---|
| I | **Introduction to Personality Development-** The concept of personality - Dimensions of personality – Theories of Freud & Erickson-Significance of personality development. The concept of success and failure: What is success? - Hurdles in achieving success - Overcoming hurdles - Factors responsible for success – What is failure - Causes of failure. SWOT analysis. | 10 |
| II | **Self-esteem Term self-esteem–** Symptoms - Advantages - Do's and Don'ts to develop positive self-esteem – Low selfesteem - Symptoms - Personality having low self esteem - Positive and negative self esteem. Interpersonal Relationships – Defining the difference between aggressive, submissive and assertive behaviours - Lateral thinking. | 10 |
| III | **Other Aspects of Personality Development-** Body language - Problem-solving - Conflict and Stress Management - Decision-making skills - Leadership and qualities of a successful leader – Character building -Team-work – Time management - Work ethics – Good manners and etiquette. | 10 |

**Books Recommended:**

*Source Books:*

Elizabeth B. Hurlock, Personality Development

# Semester - II

## GE/OE-2: Stress Management

**(This course will be available for the students other than faculty of Humanities)**

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Total Credits: 02                                Total Contact Hours: 30 Hrs

Maximum Marks : 50

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**Learning Objectives of the Course:**

   i)  **Understanding Sources of stress**
   ii)  **Knowing techniques of relaxation**
   iii) **Learn different methods of stress reliving exercise**

**Course Outcomes (COS):**

After completion of the course, students will be able to

**i)Learn Sources of stress**
**ii)Understand techniques of relaxation**
**iii)Know different methods of stress reliving exercise**

| Module No. | Topics / actual contents of the syllabus | Contact Hours |
|---|---|---|
| I | **Introduction to Stress** <br> Stress: What is it? Sources of Stress, Types of Stressors, Internal Sources of Stress and Anxiety, Cognitive Aspects of Stress and Anxiety, Anxious Thoughts ,Signs and Symptoms of Stress Overload Effects of Stress ,50 Common Signs and Symptoms of Stress | 10 |
| II | **Stress Relieving Techniques** <br> Diagram of the Effects of Stress on the Body, Questions to Consider When Assessing for Stress , The Stress Response, The Relaxation Response, Mindfulness, How to do a Mindfulness Exercise, 10 Simple Ways to Practice Mindfulness Each Day, Relaxation in a Hurry, Relaxing Your Body at Work | 10 |
| III | **Exercise** <br> Progressive Muscle Relaxation, Deep Breathing, Guided Imagery, Self Massage and Self Massage Techniques, Thought Stopping Techniques, List of 38 Stress Busters | 10 |

**Books Recommended-**

Klinic Community Health Centre, Stress & Stress Management, 2010