COURSE HANDBOOK

ON

COMPUTER SCIENCE WORKSHOP1 (CSE2141)

(3rd Semester)

DEPARTMENT OF MECHANICAL ENGINEERING

Faculty of Engineering and Technology,

Institute of Technical Education and Research

SIKSHA 'O' ANUSANDHAN (DEEMED TO BE) UNIVERSITY

Bhubaneswar, Odisha, India

(JULY 2022)

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PREFACE

This file contains all the necessary details of the concerned subject, i.e., Computer Science Workshop1 (CSE 2141). It also provides necessary details about the Grading Pattern, the Outcomes (POs, PEOs, PSOs), Bloom's Taxonomy, Course Assessment, Grading System, Graduation CGPA requirements, Minimum Requirements for Passing Grade, Appearing the (Deemed to be University) Exam, and the Assessment Rubrics. Outcome Based Education ***(OBE)*** *is followed.*

1. Course Details

Name of the Course : Computer Science Workshop1

Course Code : CSE2141

Course Credits : 4

Grading Pattern : 5

Branch and Semester : Computer Science and Engineering, 3rd Semester (CSE-O)

Name of the Instructor: Amit Jena

Contact Details : 754 0873 626 (WhatsApp and Call)

Email : amitjena@soa.ac.in

SUBJECT CODE	SUBJECT NAME	CREDIT	GRADING PATTERN
The course topics will include study about how to design and implement different problems using HTML, CSS, bootstrap, Java language, style of writing program. Studying syntax for using different component of java, such as string. Some advance feature as spring frame work, hibernate, using java also cover in this course.		**Text Book:** Full Stack Java Development with Spring MVC, Hibernate, jQuery, and Bootstrap by Mayur Ramgir, Wiley India **Course Format:** 3 3hr Lab/Week = 4 Credits	

2. Course Outcomes (COs) and Mapping Course Outcomes with Program Outcomes (POs)

Course Outcomes		Program Outcomes
CO1	Understand full stack development, web application development, and model view controller.	PO1
CO2	Understand and implement HTML, cascading style sheet(CSS), CSS configuration with HTML.	PO1, PO2
CO3	Become acquainted with jQuery, Bootstrap, java syntax.	PO1, PO2, PO3
CO4	Structuring Data with Java, Object-Oriented Techniques, Functional Programming Techniques.	PO1, PO2, PO3
CO5	Understanding collection, error handling garbage collection, multi treading.	PO1, PO2, PO3
CO6	Become familiar with Spring framework, spring MVC, and hibernate.	PO1, PO2, PO3

*Refer Appendix for list of POs

3. Course Articulation Matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO3	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
CO4	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0
CO5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0
CO6	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0

*0: No correlation, 1: Slight (Low), 2: Moderate, 3: Substantial (High)

*Refer Appendix for list of POs

4. Justifications of Mapping

Justification about the correlation between COs Vs POs & PSOs mentioned in the Articulation Matrix. Please describe the justifications.

5. Grading Pattern and Components of Evaluation

The Subject, Computer Science Workshop1 (CSE 2141), has 4 Credits, and belongs to Grading Pattern 5. The **Fifth Grading Pattern** will be for those Subjects which are of 4 credits, and which has only laboratory components. The breakdown required for the calculation of the Numeric Score (out of 100) for Grading Pattern 5 is given below.

ATTENDANCE	5
MAJOR LAB / SESSION ASSIGNMENTS / QUIZZES	20
MID TERM	15
TOTAL INTERNAL	40

External Lab EXAM	60
TOTAL EXTERNAL	60

6. Tentative Lesson Plan

Lecture/Lab #	Tasks	Mapping with COs
Lab1	Introduction to course and POs and COs. Introduction to full stack web development Introduction to web application development	**All COs, POs, PSOs**
Lab2	Back-end Technology, Introduction to back-end development with java 11, introduction	**CO1, CO2, CO3, CO4, CO5**
Lab3	Introduction to web service Communication between front end and back end. Introduction to ORM with hibernate	**CO1**
Lab4	Getting started with full stack development, Introduction, project outline	**CO1**
Lab5	What is E-Commerce, Required Entities, Entity relationship diagram, UML class diagram	**CO1**
Lab6	Flow chart, Front-end page flow design, back-end service API end points	**CO1**

Lab7	Introduction to hyper text mark up language, overview of HTML. Important component of HTML, Text formatting tags	**CO2**
Lab8	Quotations, comments, links, image, table	**CO2**
Lab9	List, attributes to style HTML elements	**CO2**
Lab10	Introduction to cascading style sheets(CSS), overview of CSS, relationship between HTML and CSS, how does CSS work Syntax	**CO2**
Lab11	Different methods to integrate CSS with HTML, colors, background in CSS, setting up height and width of an elements	**CO2**
Lab12	Box model, CSS outline, text in CSS, fonts, link in CSS, table in CSS, responsiveness, positioning property in CSS navigation bar, dropdown, forms.	**CO2**
Lab13	Overview of jQuery, configuration of JQuery, Selector, Events	**CO3**
Lab14	Effects, Working with HTML	**CO1, CO2**
Lab15	JQuery with CSS, Traversing	**CO1, CO2**
Lab16	Overview of Bootstrap, Structure of a bootstrap-enabled web page, Grid, typography.	**CO3**
Lab17	Color, Images, jumbotron, alert, buttons, button groups.	**CO3**
Lab18	Progress bars, pagination, cards, navigation bar, forms, carousel, mediaobject	**CO3**
Lab19	Building pages for MyEShop with HTML, and css, setting up environment, identify the pages, Getting started with HTML pages, Adding CSS to the HTML page	**CO1, CO2, CO3**
Lab20	Use of JQuery on HTML CSS, Getting started with JQuery, Home page with jQuery	**CO1, CO2, CO3**
Lab21	Use of Bootstrap to make HTML responsive, setting up environment, homepage with bootstrap	**CO1, CO2, CO3**
Lab22	Overview of Java, basic java concepts, principle of object-oriented programming in java, programming in java, java packages, new features in java 9, Eclipse IDE for programming	**CO4**
Lab23	Building block of java, calling the main method.	**CO4**
Lab24	String operation, arrays, enums.	**CO4**
Lab25	Wrapper class, autoboxing and unboxing, developing logic	**CO4**
Lab26	Control flow, loops, branching.	**CO4**
Lab27	Objected oriented programming principles, Objected oriented programming principles in application ,understanding an interface	**CO4**
Lab28	Overriding and overloading, coupling and cohesion, implementation in java.	**CO4**

Lab29	Future of object-Oriented programming, Generic programming, collections.	**CO5**
Lab30	Implementation of collection classes, list of key methods for array and collections	**CO5**
Lab31	Understanding error handling, logical error, syntactical errors.	**CO5**
Lab32	Semantic error, Importance of error handling, Checked verses run-time exception.	**CO5**
Lab33	Garbage collection in java, Major garbage collections, G1 and CMS garbage collectors	**CO5**
Lab34	Advantage of garbage collection in java, making object eligible for garbage collection, JEP 318-Epsilon : A noop garbage collector	**CO5**
Lab35	Role of string in java, types of string operation, StringBuilder and StringBuffer explained.	**CO5**
Lab36	Java I/O, file management in java, Introduction to data structure, Classification of data structures	**CO5**
Lab37	Functional programming Functional programming in java, Object oriented versus functional programming.	**CO5**
Lab38	Lambdas, date and time APIs, What is multi-threading, concurrency, deadlock.	**CO5**
Lab39	Concurrent data structures, multi-threading examples, design concurrent java program.	**CO5**
Lab40	Spring framework, Spring architecture, Spring MVC.	**CO6**
Lab41	Hibernate architecture, installation and configuration.	**CO6**
Lab42	Java object in hibernate, inheritance mapping, collection mapping, collection mapping, mapping with map, hibernate query language.	**CO6**

7. Assessment Rubric for the Course

Method: Assignments, Lab Report and Mid-Semester and End-Semester Exam

Outcomes Assessed:

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 – Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate

consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PSO1- Modelling and Analysis: The ability to understand, analyze and develop computer programs in the areas related to business intelligence, web design and networking for efficient design of computer-based systems of varying complexities.

PSO2- Design and Development: The ability to apply standard practices and strategies in software development using open-ended programming environments to deliver a quality product for business success.

Mid-Semester and End-Semester Examination Rubrics			
Performance	**High (2 Marks)**	**Medium (1-1.5 Marks)**	**Low (0.5 Marks)**
Theoretical representation of concepts	Properly able to define, represent, and interpret the physical significance.	Minor errors in definition, representation and interpretation of physical significance.	Incomplete or poor definition, representation and interpretation of physical significance.
Pictorial representation of ideas	Neat, clean and proper sketches, graphs with proper labelling and interpretation.	Sketches and Graphs are drawn but interpretation of significance is not done or labelling is missing.	The pictures are unclear/not labelled and the interpretation is inappropriate.

Solving mathematical and/or design problems and interpreting the results	Selection of appropriate concepts to formulate. Ability to solve problems, represent them pictorially and interpret the results.	Able to select correct concepts, formulate, represent and solve, but error in interpreting	Erroneous selection of concepts, able to represent and formulate only, but error in solving.

Rubrics for Lab Component			
Performance	**High (9-10 Marks)**	**Medium (7-8 Marks)**	**Low (4-6 Marks)**
Lab Experiments and Report	Student demonstrates an accurate understanding of the lab objectives and concepts. Questions are answered completely and correctly. Graphs are neat, creative and include complete titles and accurate units. Errors, if any, are minimal.	Student has a basic knowledge of content, but may lack some understanding of the same concepts. Questions are answered fairly well and/or graphs could have been done more neatly, accurately or with more complete information.	Student has problems with both the graphs and the answers. Student appears to have not fully grasped the lab content, and the graphs(s) possess multiple errors. Student turns in lab report late or the report is so incomplete and/or so inaccurate that it is unacceptable.
Lab Participation and Presentation	Student demonstrates an accurate understanding of the lab objectives and concepts. The student can correctly answer questions and if appropriate, can explain concepts to fellow classmates. Student is eager to participate and assist when needed. The student has attended all labs.	Student arrives on time to lab, but maybe unprepared. Answers to questions are basic and superficial suggesting that concepts are not fully grasped. The student has missed few (2-3) lab classes.	The unpreparedness of student makes it impossible to fully participate. If able to participate, student has difficulty explaining key lab concepts. The student has missed many (5-6) lab classes.

Viva-voice	The student is able to answer all the asked questions pleasingly, and explains all the concepts reasonably well, and in details.	Is able to answer some of the asked questions satisfactorily, and explains the concepts well.	The student doesn't understand the concepts and hence answers the questions but the logic or is concept explanation provided is improper.

Rubrics for Quiz			
Performance	**High (9-10 Marks)**	**Medium (7-8 Marks)**	**Low (4-6 Marks)**
Short/Long Answer Type Questions	The student has answered all the questions correctly and depicted them in a neat and clean manner, with appropriate explanation.	The student has answered most of the questions correctly and depicted them in a satisfactory manner.	The student has answered some of the questions correctly, though, with improper /erroneous/incomplete justification of the same.
MCQ Type Questions	The student has attended all the quizzes and attempted all the questions correctly.	The student has attended most of the quizzes and attempted most of the questions correctly.	The student has attended some of the quizzes and answers few of the questions correctly.

Rubrics for Assignments			
Performance	**High (9-10 Marks)**	**Medium (7-8 Marks)**	**Low (4-6 Marks)**
Completion and Submission of Assignments	Completed and submitted all assignments within deadline. The answers are depicted correctly, completely and in a neat and clean manner. The answers maybe unique/innovative.	Completed and submitted above 80% of the assignments. Submission is by the due date. The answers were fairly represented.	Completed 60% of the assignments. The submissions were made after repeated reminders, and in the extended deadline period. The answers were fairly represented.

Rubrics for Mini Project			
Performance	**High (9-10 Marks)**	**Medium (7-8 Marks)**	**Low (4-6 Marks)**
Articulate problem statements and identify objectives	Problem statement is clear and objectives are completely defined.	Problem statement is clear and objectives are not in line with problem statement.	Problem statement and objectives are not clear.
Identify engineering systems, variables, and parameters to solve the problems	Engineering systems are identified. Variables, and parameters to solve the problems are completely defined .	Engineering systems are clear. Variables, and parameters to solve the problems are not defined.	Engineering systems are identified but not clear. Variables, and parameters to solve the problems are not defined
Apply formal idea generation tools to develop multiple engineering design solutions	Able to generate engineering designs with justification.	Able to use the tool but not able to generate engineering designs.	Able to identify but not able to use it effectively.
Build models/ prototypes to develop diverse set of design solutions	Able to generate and justify the best solution.	Able to use the tool but not able to generate alternatives.	Able to choose the tool but not able to use it effectively.
Generate information through appropriate tests to improve or revise design	Able to apply information for the improvement.	Able to follow testing procedures but not able to collect information.	Able to identify but not able to follow testing procedure.
Analyze data for trends and correlations, stating possible errors and limitations	Able to identify errors and limitations.	Able to analyze data but not able to correlate them.	Able to understand but not able to analyze data.
Present results as a team, with smooth integration of contributions from all individual efforts.	Contribution from an individual to a team is good and results in an integrated team presentation.	Contributions from an individual to a team is moderate.	Contributions from an individual to a team is minimal.

Note – For specific assessments, specific rubrics may be followed.

8. Course Related Surveys

Pre-requisite Survey: The objective of this survey is to know the basic understanding and different skills relevant to the subject, i.e., Computer Science Workshop1 (CSE 2141). Please respond to the questions by clicking any one of the options against each of the following questions.

1. Ability to apply: Apply the knowledge of mathematics, science, engineering fundamentals (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

2. Identify, formulate, and analyse complex engineering problems (PO2).

(a) Low Understanding (b) Medium (c) Adequate/High

3. Design solutions for complex engineering problems (PO3).

(a) Low Understanding (b) Medium (c) Adequate/High

4. Ability to solve problems (PO1, PO2).

(a) Low Understanding (b) Medium (c) Adequate/High

5. Programming using java (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

6. Basic knowledge about HTML, CSS, Stylesheet (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

7. Understanding full stack development process (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

8. Knowledge of MVC (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

9. Understanding of basics of Java programming. (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

10. Knowledge about the Backend programming (PO1).

(a) Low Understanding (b) Medium (c) Adequate/High

Interim Course Progress Survey: The objective of this survey is to know the students' progress in basic understanding and attaining different outcomes relevant to the subject, i.e., , Computer Science Workshop1 (CSE 2141). Please respond to the questions by clicking any one of the options against each of the following questions. The outputs will be shared with the respective Faculty Advisors for further necessary actions.

Course End Survey: The objective of this survey is to know the attainment of the outcomes relevant to the subject, i.e., , Computer Science Workshop1 (CSE 2141). Please respond to the questions by clicking any one of the options against each of the following questions.

APPENDIX I – VISION

The Siksha 'O' Anusandhan will be a leading institution of higher learning in its chosen areas of concentration, preparing future generations through quality teaching and innovative research and will emerge as a comprehensive and socially inclusive University in the country for professional advancements in related disciplines.

APPENDIX II – MISSION

- Educate students to become responsible, enlightened, and productive citizens;
- Conduct scholarship and promote entrepreneurship that improve the human condition;
- Serve business, education, government, health care systems, and community; and
- Enhance the cultural environment of the region.

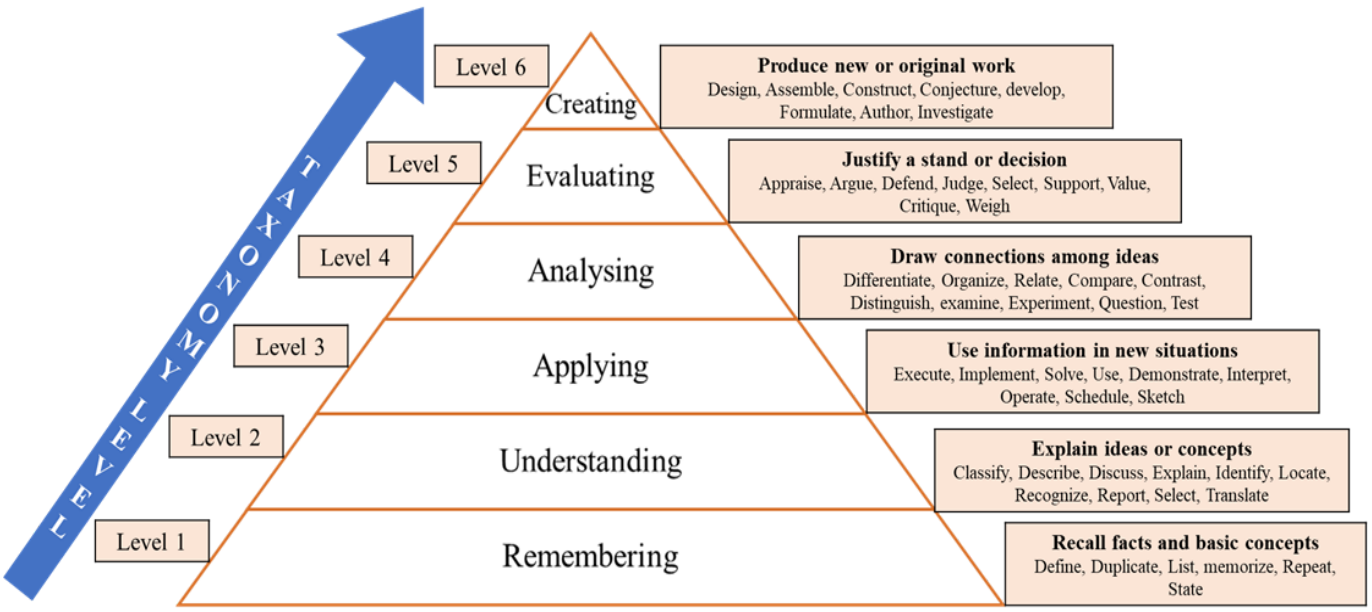
APPENDIX III – PROGRAM EDUCATIONAL OBJECTIVES (PEO)	
1	Our Graduates will have successful professional careers in industry, government, academia or non-profit organisations.
2	Our Graduates will effectively lead, work and communicate in multidisciplinary teams and apply sound engineering principles and design methodology to solve societal problems.
3	Our Graduates will maintain currency in their chosen field through higher study, through organizational participation and through participation in professional developmental activities.

APPENDIX IV – PROGRAM SPECIFIC OUTCOMES (PSO)	
PSO1	Modelling and Analysis: The ability to understand, analyze and develop computer programs in the areas related to business intelligence, web design and networking for efficient design of computer-based systems of varying complexities.
PSO2	Design and Development: The ability to apply standard practices and strategies in software development using open-ended programming environments to deliver a quality product for business success.

APPENDIX V – PROGRAM OUTCOMES (PO)	
POs	**Description**
PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9	**Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

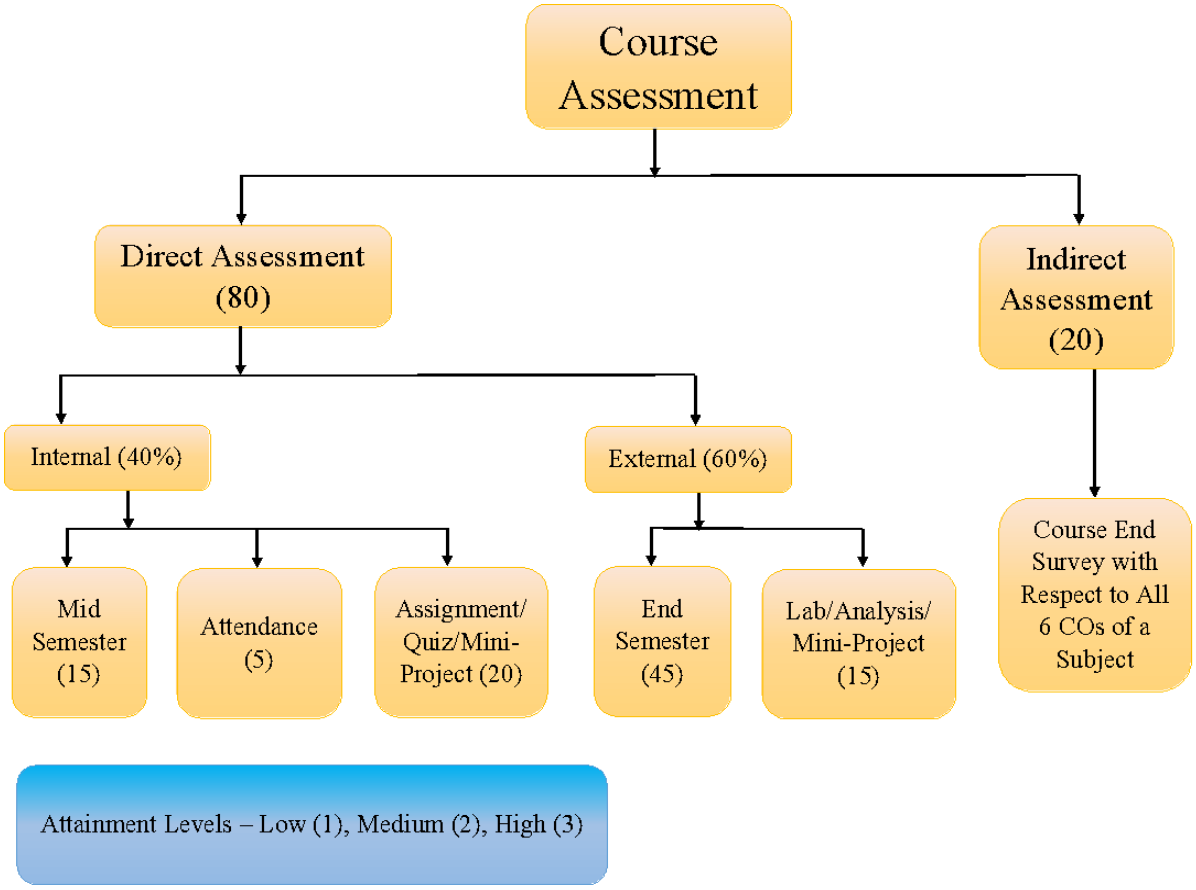
APPENDIX VI – BLOOM'S TAXONOMY



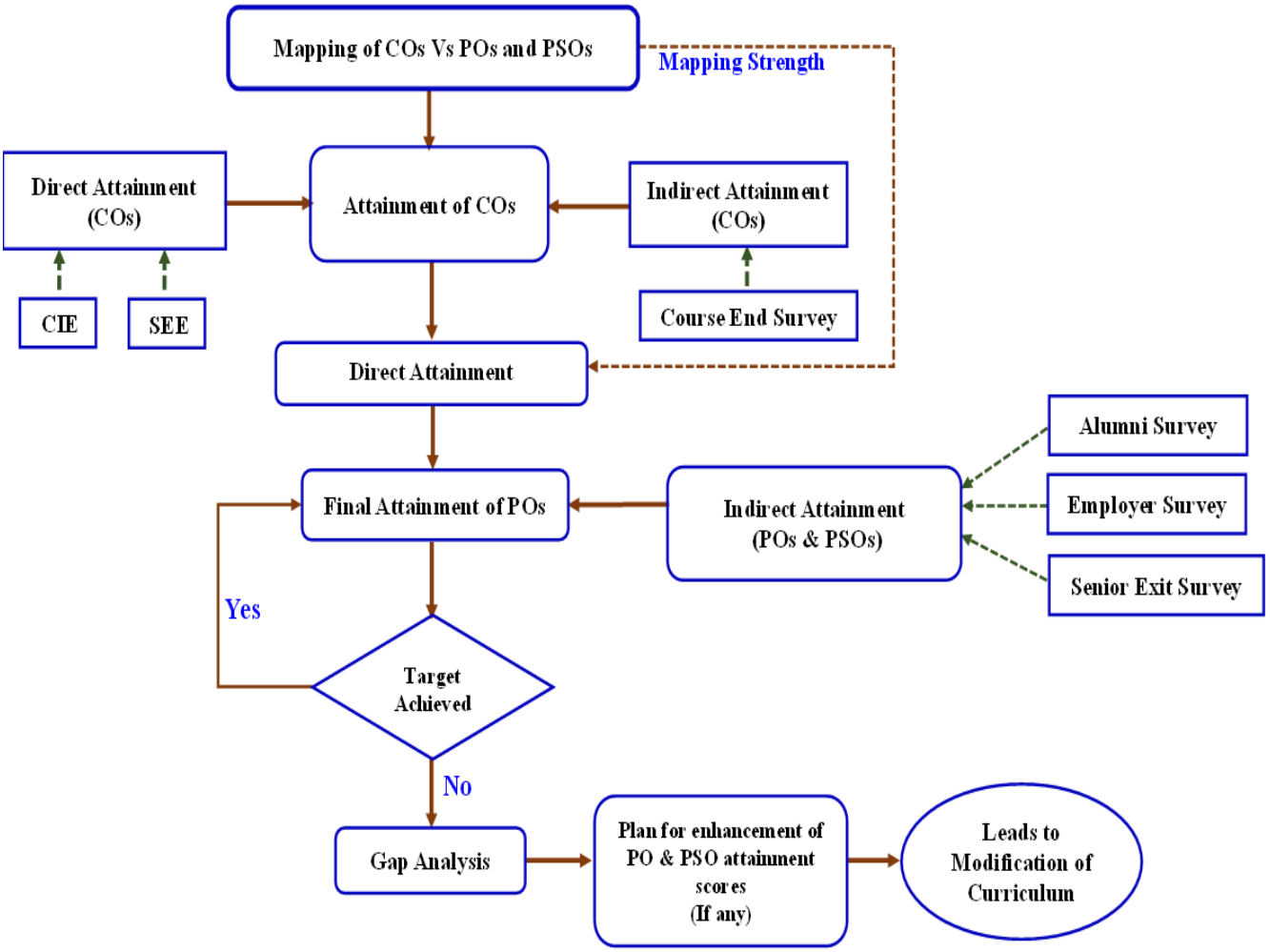
In this subject, Levels 1–4 of Bloom's Taxonomy, i.e., Remembering–Analysing are covered.

APPENDIX VII – COURSE ASSESSMENT

(FOR GRADING PATTERN 1)



APPENDIX VIII – ATTAINMENT OF COs, POs, & PSOs



APPENDIX IX – GRADING SYSTEM

Performance	Letter grade	Grade Point Per Credit
Outstanding	O	10
Accomplished	A	9.5
Impressive	B	8.5
Encouraging	C	7.5
Acceptable	D	6.5
Must do better	E	5.5
Fail	F	0

PERCENTAGE EQUIVALENCE CONVERSION FOR CGPA:

Percentage of Marks = CGPA Multiplied by 10

APPENDIX X – 9.1.2 RELATIVE GRADING

LETTER GRADE	STUDENTS RANGE	GRADE POINT
O	Top 5%	10
A	Next 10%	9.5
B	Next 20%	8.5
C	Next 30%	7.5
D	Next 20%	6.5
E	Remaining Students having Numeric Score >= 40	5.5
F	Numeric Score < 40	0

The minimum possible cutoff used for “E” grade is 40 (Internal + External), i.e., if the marks obtained are less than 40 (Internal + External) then the student won't be given an "E" grade (or above) in a particular instance of the Subject irrespective of value of cutoff for “E” grade.

The Relative Grading System will only be applicable for those subjects which follow Grading Patterns 1, 2, and 6. For Relative grading to be applicable, the number of students in the subject will need to be at least 12. Absolute Grading will be applicable otherwise.

APPENDIX XI – 10. GRADUATION CGPA REQUIREMENTS

The Minimum Cumulative Grade Point Average required for Graduation is **6.0**, i.e., a student can only be considered for graduation if and only if his/her Cumulative Grade Point Average (after complying with all the requirements of the (Deemed to be University) and the Constituent College required for graduation) is **greater than or equal to 6.0 (six point zero)**.

APPENDIX XII – 12. MINIMUM REQUIREMENTS FOR A PASSING GRADE

The Minimum Attendance and Numeric Score Requirements for a passing grade at Institute of Technical Education and Research (ITER), Siksha ‘O’ Anusandhan (Deemed to be University) which will be followed from admission year 2018-2019.

NUMERIC SCORE REQUIREMENTS	
INTERNAL	16
EXTERNAL	24
TOTAL	40

ATTENDANCE REQUIREMENTS	
ATTENDANCE	75%

APPENDIX XIII – 15. APPEARING THE (DEEMED TO BE UNIVERSITY) EXAM

The Minimum Numeric Score and Attendance Requirements for appearing the External Exam of a subject are as mentioned below.

NUMERIC SCORE REQUIREMENTS (For External Exam)	
INTERNAL COMPONENT	16

ATTENDANCE REQUIREMENTS (For External Exam)	
ATTENDANCE	75%