CCD415	DDO IECT DILAGE I	CATEGORY	L	T	P	CREDIT
CSD415	PROJECT PHASE I	PWS	0	0	6	2

Preamble: The course 'Project Work' is mainly intended to evoke the innovation and invention skills in a student. The course will provide an opportunity to synthesize and apply the knowledge and analytical skills learned, to be developed as a prototype or simulation. The project extends to 2 semesters and will be evaluated in the 7th and 8th semester separately, based on the achieved objectives. One third of the project credits shall be completed in 7th semester and two third in 8th semester. It is recommended that the projects may be finalized in the thrust areas of the respective engineering stream or as interdisciplinary projects. Importance should be given to address societal problems and developing indigenous technologies.

Course Objectives

- > To apply engineering knowledge in practical problem solving.
- To foster innovation in design of products, processes or systems.
- To develop creative thinking in finding viable solutions to engineering problems.

Course Outcomes [COs]: After successful completion of the course, the students will be able to:

CO1	Model and solve real world problems by applying knowledge across domains						
601	(Cognitive knowledge level: Apply).						
CO2 Develop products, processes or technologies for sustainable and socially rele							
CO2	applications (Cognitive knowledge level: Apply).						
CO3	Function effectively as an individual and as a leader in diverse teams and to						
003	comprehend and execute designated tasks (Cognitive knowledge level: Apply).						
CO4	Plan and execute tasks utilizing available resources within timelines, following						
004	ethical and professional norms (Cognitive knowledge level: Apply).						
CO5	Identify technology/research gaps and propose innovative/creative solutions						
1003	(Cognitive knowledge level: Analyze).						
CO6	Organize and communicate technical and scientific findings effectively in written						
C00	and oral forms (Cognitive knowledge level: Apply).						

Mapping of course outcomes with program outcomes

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

	Abstract POs defined by National Board of Accreditation									
PO#	Broad PO	PO#	Broad PO							
PO1	Engineering Knowledge	PO7	Environment and Sustainability							
PO2	Problem Analysis	PO8	Ethics							
PO3	Design/Development of solutions	PO9	Individual and team work							
PO4	Conduct investigations of complex problems	PO10	Communication							
PO5	Modern tool usage	PO11	Project Management and Finance							
PO6	The Engineer and Society	PO12	Lifelong learning							

PROJECT PHASE I

Phase 1 Target

- Literature study/survey of published literature on the assigned topic
- > Formulation of objectives
- Formulation of hypothesis/ design/methodology
- Formulation of work plan and task allocation.
- ➤ Block level design documentation
- > Seeking project funds from various agencies
- Preliminary Analysis/Modeling/Simulation/Experiment/Design/Feasibility study

Estd.

> Preparation of Phase 1 report

Evaluation Guidelines & Rubrics

Total: 100 marks (Minimum required to pass: 50 marks).

- > Project progress evaluation by guide: 30 Marks.
- ➤ Interim evaluation by the Evaluation Committee: 20 Marks.
- Final Evaluation by the Evaluation Committee: 30 Marks.
- ➤ Project Phase I Report (By Evaluation Committee): 20 Marks.

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor).

Evaluation by the Guide

The guide/supervisor shall monitor the progress being carried out by the project groups on a regular basis. In case it is found that progress is unsatisfactory it shall be reported to the Department Evaluation Committee for necessary action. The presence of each student in the group and their involvement in all stages of execution of the project shall be ensured by the guide. Project evaluation by the guide: 30 Marks. This mark shall be awarded to the students in his/her group by considering the following aspects:

Topic Selection: innovativeness, social relevance etc. (2)

Problem definition: Identification of the social, environmental and ethical issues of the project problem. (2)

Purpose and need of the project: Detailed and extensive explanation of the purpose and need of the project. (3)

Project Objectives: All objectives of the proposed work are well defined; Steps to be followed to solve the defined problem are clearly specified. (2)

Project Scheduling & Distribution of Work among Team members: Detailed and extensive Scheduling with timelines provided for each phase of project. Work breakdown structure well defined. (3)

Literature survey: Outstanding investigation in all aspects. (4)

Student's Diary/ Daily Log: The main purpose of writing daily diary is to cultivate the habit of documenting and to encourage the students to search for details. It develops the students' thought process and reasoning abilities. The students should record in the daily/weekly activity diary the day to day account of the observations, impressions, information gathered and suggestions given, if any. It should contain the sketches & drawings related to the observations made by the students. The daily/weekly activity diary shall be signed after every day/week by the guide. (7)

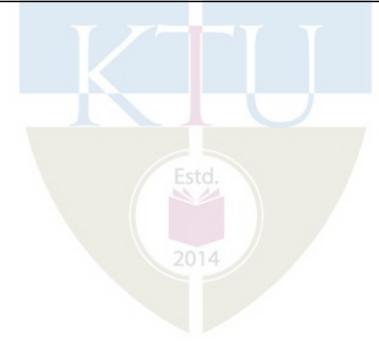
Individual Contribution: The contribution of each student at various stages. (7)

EVALUATION RUBRICS for PROJECT Phase I: Interim Evaluation

No.	Parameters	Marks	Poor	Fair	Very Good	Outstanding
1-a	Topic identification, selection, formulation of objectives and/or literature survey. (Group assessment) [CO1]	10	The team has failed to come with a relevant topic in time. Needed full assistance to find a topic from the guide. They do not respond to suggestions from the evaluation committee and/or the guide. No literature review was conducted. The team tried to gather easy information without verifying the authenticity. No objectives formed yet.	The team has identified a topic. The originally selected topic lacks substance and needs to be revised. There were suggestions given to improve the relevance and quality of the project topic. Only a few relevant references were consulted/ studied and there is no clear evidence to show the team's understanding on the same. Some objectives identified, but not clear enough.	thinking and brainstorming on what they are going to build. The results of the brainstorming are documented and the selection of topic is relevant. The review of related references was good, but there is scope of improvement. Objectives formed with good	The group has brainstormed in an excellent manner on what they were going to build. The topic selected is highly relevant, real world problem and is potentially innovative. The group shows extreme interest in the topic and has conducted extensive literature survey in connection with the topic. The team has come up with clear objectives which are feasible.
			(0 – 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)
1-b	Project Planning, Scheduling and Resource/ Tasks Identification and allocation. (Group assessment) [CO4]	10	scheduling of the project. The students did not plan what they were going to build or plan on what materials / resources to use in the project. The students do not have any idea on the budget required. The team has not yet decided on who	required, but not really thought out. The students have some idea on the finances required, but they have not formalized a budget plan. Schedules were	Good evidence of planning done. Materials were listed and thought out, but the plan wasn't quite complete. Schedules were prepared, but not detailed, and needs improvement. Project journal is presented but it is not complete in all respect / detailed. There is better task allocation and individual members understand about their tasks. There is room for improvement.	Excellent evidence of enterprising and extensive project planning. Gantt charts were used to depict detailed project scheduling. A project management/version control tool is used to track the project, which shows familiarity with modern tools. All materials / resources were identified and listed and anticipation of procuring time is done. Detailed budgeting is done. All tasks were identified and incorporated in the schedule. A well-kept project journal shows evidence for all the above, in addition to the interaction with the project guide. Each member knows well about their individual tasks.
			(0 – 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)
			F	hase 1 Interim Evaluation Tota	1 Marks: 20	

			EVALUATI	ION RUBRICS for PROJECT Pha	se I: Final Evaluation	
S1. No.	Parameters	Marks	Poor	Fair	Very Good	Outstanding
1-c	Formulation of Design and/or Methodology and Progress. (Group assessment) [CO1]	5	knowledge about the design and the methodology adopted till now/ to be adopted in the later stages. The team has	knowledge on the design procedure to be adopted, and the methodologies. However, the team has not made much progress in the design, and yet to catch up with the project	with design methods adopted, and they have made some progress as per the plan. The	Shows clear evidence of having a well- defined design methodology and adherence to it. Excellent knowledge in design procedure and its adaptation. Adherence to project plan is commendable.
			(0 – 1 Marks)	(2 – 3 Marks)	(4 Marks)	(5 Marks)
1-d	Individual and Teamwork Leadership (Individual assessment) [CO3]	10	The student does not show any interest in the project activities, and is a passive member.	land participates in some of the	tasks and attempts to complete	The student takes a leadership position and supports the other team members and leads the project. Shows clear evidence of leadership.
			(0 - 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)
1-е	Preliminary Analysis/ Modeling / Simulation/ Experiment / Design/ Feasibility	10	The team has not done any preliminary work with respect to the analysis/modeling/simulation/experiment/design/feasibility study/algorithm development.	some preliminary work with respect to the project. The	amount of preliminary investigation and design/analysis/modeling etc.	progress in the project. The team
	study [CO1]		(0 – 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)

Documentati n and presentation (Individual 8 group assessment) [CO6]	5	presented. The presentation was shallow in content and dull in appearance.	but not extensive. Interwith the guide is minimal. Presentation include points of interest, but quality needs to be imp	some overall i	There is scope for improvement. The presentation is satisfactory. Individual	The project stages are extensively documented in the report. Professional documentation tools like LaTeX were used to document the progress of the project along with the project journal. The documentation structure is well-planned and can easily grow into the project report. The presentation is done professionally and with great clarity. The individual's performance is excellent.
Total	30	(0 – 1 Marks)	(2 – 3 Marks) Phase - I Final Evalua	tion Ma	(4 Marks)	(5 Marks)



	EVALUATION RUBRICS for PROJECT Phase I: Report Evaluation								
S1. No.	Parameters	Marks	Poor	Fair		Very Good	Outstanding		
1-g	Report [CO6]	20	shallow and not as per standard format. It does not follow proper organization. Contains mostly	extent. However, organization is not very Language needs to improved. All references	some its good. be s are the	following the stand format and there are onl few issues. Organization the report is good. M	The report is exceptionally good. Neatly organized. All references cited properly. Diagrams/Figures, Tables and equations are properly numbered, and listed and clearly shown Language is		
			(0 - 7 Marks)	(8 - 12 Marks)		(13 - 19 Marks)	(20 Marks)		
				Phase - I Projec	ct Rep	oort Marks: 20			

CCD 44.6	DDO JECT DILACE II	CATEGORY	L	T	P	CREDIT
CSD416	PROJECT PHASE II	PWS	0	0	12	4

Preamble: The course 'Project Work' is mainly intended to evoke the innovation and invention skills in a student. The course will provide an opportunity to synthesize and apply the knowledge and analytical skills learned, to be developed as a prototype or simulation. The project extends to 2 semesters and will be evaluated in the 7th and 8th semester separately, based on the achieved objectives. One third of the project credits shall be completed in 7th semester and two third in 8th semester. It is recommended that the projects may be finalized in the thrust areas of the respective engineering stream or as interdisciplinary projects. Importance should be given to address societal problems and developing indigenous technologies.

Course Objectives

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	(Cognitive knowledge level: Apply).							
CO2	Develop products, processes or technologies for sustainable and socially relevant							
COZ	applications (Cognitive knowledge level: Apply).							
CO3	Function effectively as an individual and as a leader in diverse teams and to							
CO3	comprehend and execute designated tasks (Cognitive knowledge level: Apply).							
CO4	Plan and execute tasks utilizing available resources within timelines, following ethical							
CO4	and professional norms (Cognitive knowledge level: Apply).							
CO5	Identify technology/research gaps and propose innovative/creative solutions							
003	(Cognitive knowledge level: Analyze).							
CO6	Organize and communicate technical and scientific findings effectively in written and							
C00	oral forms (Cognitive knowledge level: Apply).							

Mapping of course outcomes with program outcomes

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

	Abstract POs defined by National Board of Accreditation										
PO #	Broad PO	PO#	Broad PO								
PO1	Engineering Knowledge	PO7	Environment and Sustainability								
PO2	Problem Analysis	PO8	Ethics								
PO3	Design/Development of solutions	PO9	Individual and team work								
PO4	Conduct investigations of complex problems	PO0	Communication								
PO5	Modern tool usage	PO11	Project Management and Finance								
PO6	The Engineer and Society	PO12	Lifelong learning								

PROJECT PHASE II

Phase 2 Targets

- In depth study of the topic assigned in the light of the report prepared under Phase I;
- Review and finalization of the approach to the problem relating to the assigned topic.
- > Preparing a detailed action plan for conducting the investigation, including teamwork.
- Detailed Analysis/ Modeling / Simulation/ Design/ Problem Solving/Experiment as needed.
- Final development of product/ process, testing, results, conclusions and future directions.
- > Preparing a paper for Conference Presentation/ Publication in Journals, if possible.
- ➤ Presenting projects in Project Expos conducted by the University at the cluster level and/ or state level as well as others conducted in India and abroad.
- Filing Intellectual Property Rights (IPR) if applicable.
- > Preparing a report in the standard format for being evaluated by the Department Assessment Board.
- Final project presentation and viva voce by the assessment board including the external expert.

Evaluation Guidelines & Rubrics

Total: 150 marks (Minimum required to pass: 75 marks).

- Project progress evaluation by guide: 30 Marks.
- Two interim evaluations by the Evaluation Committee: 50 Marks (25 marks for each evaluation).
- Final evaluation by the Final Evaluation committee: 40 Marks
- ➤ Quality of the report evaluated by the evaluation committee: 30 Marks

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor. The final evaluation committee comprises of Project coordinator, expert from Industry/research/academic Institute and a senior faculty from a sister department).

Evaluation by the Guide

The guide/supervisor must monitor the progress being carried out by the project groups on regular basis. In case it is found that progress is unsatisfactory it should be reported to the Department Evaluation Committee for necessary action. The presence of each student in the group and their involvement in all stages of execution of the project shall be ensured by the guide. Project evaluation by the guide: 30 Marks. This mark shall be awarded to the students in his/her group by considering the following aspects:

Project Scheduling & Distribution of Work among Team members: Detailed and extensive Scheduling with timelines provided for each phase of project. Work breakdown structure well defined. (5)

Literature survey: Outstanding investigation in all aspects. (4)

Student's Diary/ Daily Log: The main purpose of writing daily diary is to cultivate the habit of documenting and to encourage the students to search for details. It develops the students' thought process and reasoning abilities. The students should record in the daily/weekly activity diary the day to day account of the observations, impressions, information gathered and suggestions given, if any. It should contain the sketches & drawings related to the observations made by the students. The daily/weekly activity diary shall be signed after every day/week by the guide. (7)

Individual Contribution: The contribution of each student at various stages. (9)

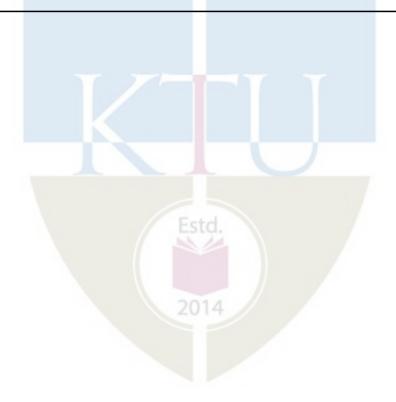
Completion of the project: The students should demonstrate the project to their respective guide. The guide shall verify the results and see that the objectives are met. (5)



	EVALUATION RUBRICS for PROJECT Phase II: Interim Evaluation - 1								
No.	Parameters	Marks	Poor	Fair	Very Good	Outstanding			
2-a	Novelty of idea, and Implementation scope [CO5] [Group Evaluation]	5	useful requirement. The idea is evolved into a non-implementable one. The work presented so far is	Some of the aspects of the proposed idea can be implemented. There is still lack of originality in the work done so far by the team. The project is a regularly done theme/topic without any freshness in terms of specifications, features, and/or improvements.	Good evidence of an implementable project. There is some evidence for the originality of the work done by the team. There is fresh specifications/features/improvements suggested by the team. The team is doing a design from fundamental principles, and there is some independent learning and engineering ingenuity.	The project has evolved into incorporating			
			(0 – 1 Marks)	(2 – 3 Marks)	(4 Marks)	(5 Marks)			
2-b	Effectiveness of task distribution among team members. [CO3] [Group Evaluation]	5	Members are still having no clue on what to do.	Task allocation done, but not effectively, some members do not have any idea of the tasks assigned. Some of the tasks were identified but not followed individually well.	being done, supported by project journal entries, identification of tasks through discussion etc. However, the task distribution seems to be skewed,	project journal entries. All members are allocated tasks according to their capabilities, and as much as possible in an			
			(0 – 1 Marks)	(2 – 3 Marks)	(4 Marks)	(5 Marks)			
2-с	Adherence to project schedule. [CO4] [Group Evaluation]	5	planning or scheduling of the project. The students did not stick to the plan what they were going to build nor plan on what materials / resources to use in the project. The students do not have any idea on the budget required even after the end of phase - I. No project journal kept or	There is some improvement in the primary plan prepared during phase I. There were some ideas on the materials /resources required, but not really thought out. The students have some idea on the finances required, but they have not formalized a budget plan. Schedules were not prepared. The project journal has no useful details on the project.	Good evidence of planning done and being followed up to a good extent after phase I. Materials were listed and thought out, but the plan wasn't followed completely. Schedules were prepared, but not detailed, and needs improvement. Project journal is presented but it is neither complete nor updated regularly.	Excellent evidence of enterprising and extensive project planning and follow-up since phase I. Continued use of project management/version control tool to track the project. Material procurement if applicable is progressing well. Tasks are updated and incorporated in the schedule. A well-kept project journal showed evidence for all the above, in addition to the interaction with the project guide.			
			(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)			

2-	Interim Results. [CO6] [Group assessment]	5	There are no interim results to show.	consistent to the current stage, Some corrections are needed.	respect to the current stage. There is room for improvement.	presented which clearly shows the progress.
			(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)
2-	Presentation [Individual assessment]	_		student has only a feeble idea about		Exceptionally good presentation. Student has excellent grasp of the project. The quality of presentation is outstanding.
	,		(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)

Phase-II Interim Evaluation - 1 Total Marks: 25



EVALUATION RUBRICS for PROJECT Phase II: Interim Evaluation – 2

No	Parameters	Marks	Poor	Fair	Very Good	Outstanding
2-f	Application of engineering knowledge [CO1] [Individual Assessment]	10	evidence of applying engineering knowledge on the design and the	basic knowledge, but not able to show the design procedure and the methodologies adopted in a	evidence of application of engineering knowledge in the design and	Excellent knowledge in design procedure and its adaptation. The student is able to apply knowledge from engineering domains to the problem and develop solutions.
			(0 – 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)
2-g	Involvement of individual members [CO3]		participation in the project work.	There is evidence for some amount of individual contribution, but is limited to some of the superficial tasks.	Involvement in core activities of the	Evidence available for the student acting
	[Individual Assessment]		(0 - 1 Marks)	(2 - 3 Ma <mark>rk</mark> s)	(4 Marks)	(5 Marks)
2-h	Results and inferences upon execution [CO5] [Group Assessment]		None of the expected outcomes are achieved yet. The team is unable to derive any inferences on the failures/issues observed. Any kind o f observations or studies are not made.	Only a few of the expected outcomes are achieved. A few inferences are made on the observed failures/issues. No further work suggested.	achieved. Many observations and inferences are made, and attempts to	Most of the stated outcomes are met. Extensive studies are done and inferences drawn. Most of the failures are addressed and solutions suggested. Clear and valid suggestions made for further work.
			(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)
2-i	Documentation and presentation[CO6] [Individual assessment]				The individual's presentation performance is satisfactory.	The individual's presentation is done professionally and with great clarity. The individual's performance is excellent.
	[marvidual assessment]		(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)

Phase-II Interim Evaluation - 2 Total Marks: 25

	EVALUATION RUBRICS for PROJECT Phase II: Final Evaluation							
No	Parameters	Marks	Poor	Fair	Very Good	Outstanding		
2-ј	Engineering knowledge. [CO1] [Group Assessment]	10	of applying engineering knowledge	The team is able to show some of the design procedure and the methodologies adopted, but not in a comprehensive manner.	application of engineering knowledge in the design and development of the project to good extent. There is scope for improvement.	Excellent knowledge in design procedure and its adaptation. The team is able to apply knowledge from engineering domains to the problem and develop an excellent solution.		
			(0 – 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)		
2-k	Relevance of the project with respect to societal and/or industrial needs. [Group Assessment] [CO2]	5	The project as a whole do not have any societal / industrial relevance at all.	respect to social and/or industrial application. The team has however made not much effort to explore	and/or industry. The team is mostly successful in translating the problem	The project is exceptionally relevant to society and/or industry. The team has made outstanding contribution while solving the problem in a professional and/or ethical manner.		
			(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)		
2-i	Innovation / novelty / Creativity [CO5] [Group Assessment]	5	useful requirement. The idea is	still lack of originality in the work done. The project is a regularly done theme/topic without any freshness in terms of specifications, features, and/or improvements.	originality of the work done by the	which is not yet reported anywhere else. Evidence for ingenious way of innovation which is also Implementable. Could be a patentable publishable work.		
			(0 - 1 Marks)	(2 - 3 Marks)	(4 Marks)	(5 Marks)		
2-m	Quality of results / conclusions / solutions. [CO1] [Group Assessment]	10	None of the expected outcomes are achieved. The team is unable to derive any inferences on the failures/issues observed. Any kind of observations or studies is not made.	made on the observed failures/issues. No further work suggested.	Many of the expected outcomes are achieved. Many observations and inferences are made, and attempts to	Most of the stated outcomes are met. Extensive studies are done and inferences drawn. Most of the failures are addressed and solutions suggested. Clear and valid suggestions made for further work.		
			(0 – 3 Marks)	(4 – 6 Marks)	(7 - 9 Marks)	(10 Marks)		

	Presentation - Part I Preparation of slides. [CO6] [Group Assessment].	5	The presentation slides are shallow and in a clumsy format. It does not follow proper organization.	style formats to some extent. However, its organization is not very good. Language needs to be improved. All references are not cited properly, or acknowledged. Presentation slides needs to be more professional.	Organization of the slides is good. Most of references are cited properly. The flow is good and team presentation is neatly organized. Some of the results are not clearly shown. There is room for improvement.	The presentation slides are exceptionally good. Neatly organized. All references cited properly. Diagrams/Figures, Tables and equations are properly numbered, and l i s ted. Results/ inferences clearly highlighted and readable.
2-n	Presentation - Part II: Individual Communication [CO6] [Individual Assessment].	5	properly. Poor response to	the content. The student requires a lot of prompts to get to the idea. There are	explain most of the content very well. There are however, a few areas where the student shows lack of preparation	exhibited by the student. The

Phase-II Final Evaluation, Marks: 40

	EVALUATION RUBRICS for PROJECT Phase II: Report Evaluation									
Sl. No.	Parameters	Marks	Poor	Fair		Very Good	Outstanding			
2-о	Report [CO6]		The prepared report is shallow and no as per standard format. It does no follow proper organization. Contains mostly unacknowledged content. Lack of effort in preparation is evident References are not cited Unprofessional and inconsisten formatting.	format to some extent. I organization is not Language needs to be in references are not cited property. There is lack or	However, its very good. nproved. All coperly in the of formatting formatting	llowing the standard style there are only a few issues on of the report is good asistently formatted. Most o	are properly numbered, and listed and clearly shown. Language is excellent and follows professional styles. Consistent			
			(0 - 11 Marks)	(12 - 18 Marks	s)	(19 - 28 Marks)	(29 - 30 Marks)			

