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**PG Diploma/ M.Tech in Artificial Intelligence**

**Capstone Project Guidelines**

**Credits: 10/12 (~ 120 hours)**

**CAPSTONE PROJECT OBJECTIVES**

The Capstone Project is to provide a culminating experience in the student’s PG Diploma / MTech program that requires the integration and application of knowledge attained in the first-year Artificial Intelligence coursework. The final certification is strictly based on the successful completion and submission of the capstone project with the favourable assessment from the panel of mentors during the viva. The objective is to develop your designing and consulting capabilities by applying the lessons learnt in the program to real life situations.

The Capstone project must be original work performed by the student. The description of a previous or current project in industry or another application area in which the student was involved as part of the effort is not acceptable.

1. **LEARNING OUTCOMES**

The capstone project will help you to develop,

* Problem-solving skills in a real-world situation: The capstone Project must derive a solution of a “problem” or capture an “opportunity” at your workplace.
* Consulting competencies in relation to solving a technical/managerial challenge for a client/business unit.
* Improve personal decision-making capabilities backed by technical skills.
* Project writing skills addressing the needs of stakeholders which can be published as a white paper or journal article.
* Contribute to the overall success of the organization by developing superior practices through implementing best practices in Artificial Intelliegce.

1. **BASIC GUIDELINES**

* The scope and focus of the problem or application area are properly defined and consistent with twelve credit hours of the course work
* The project must be career enhancing and based on a live technical challenge.
* This is an individual exercise.
* Ideally, ~120 hours of work per person is required to earn a maximum credits which is 10/12.
* One can undertake multiple projects on their own to create a portfolio of capstone projects.
* We would highly recommend publishing your work as a white paper/a journal article/blogs. Please do mention REVA University affiliation in your publication. You can co-author the paper with your mentor and us to get a faster publication. You may also identify a company mentor.
* You will be assigned a mentor based on the fitment along with support from RACE program office.
* All candidates shall pretest the report using anti-plagiarism software, before submission of the capstone project.
* The University would cross check the malpractice/plagiarism using anti-plagiarism software and shall initiate necessary disciplinary action against the candidate, in addition to rejecting the capstone report.
* No. of hard copies: One hard bound copy (White bond paper, Front cover in white with gold embossed letters) of the capstone project must be submitted to the University (the Director of respective School through his / her Project Guide). The candidate is advised to keep a copy of the same for personal use.
* The project relates to the technology of a project more than simply being a software project or research effort since the credits of this project leads to a PGDM / MTech with a concentration in Technology.
* The soft copy of the project report must also be submitted in the LMS.

1. **PROJECT WRITING FORMAT[[1]](#footnote-1)**

The contents that are required in the report are given in the ‘Table of Contents’ in the shared report template. However, it must include:

* 1. Cover Page (format Given)
  2. Candidate’s Declaration page **-** containing the signature of the candidate, guide, co-guide if any.
  3. Certificate by the company (if applicable)
  4. Acknowledgement
  5. Table of contents with page references
  6. List of tables with titles and page references
  7. List of illustrations / Screen Shots if any, with titles and page references
  8. List of Symbols, Abbreviation of Nomenclature
  9. **Abstract**
  10. **Chapters**
  11. **References**
  12. **Bibliography and Webliography**
  13. **Appendices, if any**
  14. **Copies of articles/Conference papers/blogs published**

1. **Chapter Scheme**

**Title Page -** The title page should contain title of the project followed by the student's name and date the report is submitted for grading. Text should be centered on the page.

**Abstract (not to exceed 1-2 pages)**

The Abstract is an important part of the report. It is a succinct summary of the longer report that allows the reader to quickly become familiar with the work described in the report without having to read it all. It briefly advises the reader of the problem, background information include the strategic importance of the problem, concise analysis of the problem, and the primary conclusions and recommendations.

**Chapter 1: Introduction (2-3 Pages)**

Introduction presents the specific problem under study. It includes general Introduction to the area of your work, current technical advancement in the area, the need of such study, scope of the study etc. State how this study will help organizations/ community. You can use figures, tables and references in the introduction.

**Chapter 2: Literature Review (2-3 pages)**

Review of background theory and existing literature:A Minimum of 10 references from renowned journals/technical reports/websites that must support the problem formulation. A literature review constitute an essential chapter of a thesis or dissertation, or may be a self-contained review of writings on a subject. In either case, its purpose is to:

• Place each work in the context of its contribution to the understanding of the subject under review

• Describe the relationship of each work to the others under consideration

• Identify new ways to interpret, and shed light on any gaps in, previous research

• Resolve conflicts amongst seemingly contradictory previous studies

• Identify areas of prior scholarship to prevent duplication of effort

• Point the way forward for further research

• Place one's original work in the context of existing literature

**Chapter 3: Problem Statement (1-2 pages)**

This section describes the history of the problem as well as its setting. The problem definition shall be described in terms of the internal and external environment where the problem is found; i.e., organization, community, etc. It shall describe groups or organizations affected by the problem (stakeholders), how they are involved, where they are located, and why they have an interest in the problem. The problem definition also describes the organizational structure, function, resources, and processes pertinent to the problem.

A discussion of the history of the problem shall include the extent and longevity of the problem, how it has changed over time, and significant events which have contributed or influenced the problem. This discussion shall also address ramifications of the problem (strategic significance), its symptoms, and why the problem is worthy of study.

**Chapter 4: Objectives of the Study (1-2 pages)**

This section shall clearly describe the purpose of the capstone project and the benefit to be gained; i.e. goals. Goals should be stated in terms of what the student is attempting to discover by conducting the research and clearly describe why this is of strategic/operational importance to the organization/community. This section may require revision as the literature review progresses and understanding of the problem is refined.

**Chapter 5: Capstone Project Methodology (2 pages)**

The Methodology section contains a description of the process that will be used to conduct the project. The tools used in the project must be specifically identified and their use must be related to solving the problem that is the focus of the capstone project

Problems faced when implementing the methodology should be discussed in the Capstone Report as well as how they were resolved. This section is written in two steps. This section addresses potential problems and how they will be resolved. If the research methodology/design was changed during the conduct of the project, the changes and the reasons for them should be addressed in this section. The project methodology should be designed to allow conclusions to be drawn about the stated problem.

**Chapter 6: Resource Requirement Specification (2-3 pages)**

Functional (can be presented in use case if you use Object Oriented Analysis (OOA) or data flow diagram (DFD) if you follow structured approach with explanation) and non-functional requirements.

**Chapter 7: Software Design (4-5 pages)**

Software design – high level (class diagram (for OOD)/architectural diagram (for structured approach)) and low level (state diagram, sequence diagram (for OOD)//flowchart (for structured approach))

**Chapter 8: Implementation (4-5 pages)**

Implementation –Code/ scripts description for every key module to be shared.

**Chapter 9: Testing and validation (3-4 pages)**

Design test cases for each functional requirement mentioned in previous chapter. Execute those on the implemented code. Results must be presented in one of the form mentioned below to justify the objectives stated, through relevant discussions and propose recommendations with substantiations.

* Text,
* Tables
* Illustrations-graphs, figures/screenshots

The contents of the tables should not be repeated in the text. Instead, a reference to the table number must be given.

Validation: Check whether Theoretical solutions to your problem is available with you or in any references Experimental results are available with you or with in some reference material. Verify /validate your results with the available results. If you are not verifying or validating your results, your results will be questioned; you should be in a position to defend your results, in such cases bench marking is necessary.

To bench mark, choose a standard problem in the area for which theoretical or experimental solutions are available, solve the problem using the method you have chosen for your project and compare your results. You need to provide explanations for the trends in your graphs and tables. The explanation should be based on theoretical background.

**Chapter 10: Analysis and Results (2-3 pages)**

The result of project and analysis are presented in this section. This section includes the outcome of the methodology; i.e., the numerical or descriptive work that was performed. For example, if a SWOT analysis is performed, the results are included in this section. Likewise, if a technical analysis is performed, the computational results are included in this section.

**Chapter 8: Conclusions and Recommendations for future work (2-3 pages)**

This is the last section of the text in which conclusions or inferences drawn on the basis of the results of study are described. The conclusions should be linked with the objectives of the study. If possible to express your concluding remarks based on certain numbers, please do so. If you have developed correlations, give such correlations. Recommendations for further research may be included when appropriate. It is important to be careful that the conclusions should not go beyond data and should be based on the study results and population.

1. **FINAL PRESENTATION AND DEFENSE**

You need to defend your capstone project during the viva. Viva panel will comprise of a mix to industry and academic experts. The evaluation will be based on the following parameters:

* Topic of the study and methodology (20%)
* Project Implementation (40%)
* Report (20%)
* Presentation and defence (20%)

Your final deck must have the following contents and must be submitted to the RACE program office as a zipped folder. Folder and files have to be named appropriately.

1. The report (MS-Word) not more than 40-50 pages. The hard bound copy to be handed over to the panel before the viva.
2. Code/scripts in Github link
3. The presentation (MS-PPT)

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1. The templates for initial pages are shared, which need to be followed strictly. [↑](#footnote-ref-1)