**TITLE**

A Capstone/Thesis/Design Project

Presented to

**EASTWOODS Professional College of Science and Technology**

A.Y: 2022 – 2023

In Partial Fulfillment of the Requirements for the degree

**Bachelor of Science in**

**COMPUTER SCIENCE**

By:

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Date of Final Defense

# APPROVAL SHEET

This Capstone Project entitled “**AskKurso**” proposed and submitted by John Carlo Banzuela, John Gabriel Blas, Herlyn Eusebio and Joshua Pilongco in partial fulfillment of the requirements for the degree **Bachelor of Science in Computer Science,** has been examined and found in order and is herebyrecommended for acceptance and approval for **ORAL EXAMINATION.**

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| **Name of Head Panel**  Chair | |
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Passed by the PANEL OF EXAMINERS on ORAL EXAMINATION with a grade of on December 18, 2021

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Accepted and approved in partial fulfillment of the requirements for the degree **Bachelor of Science in Computer Science.**

# ABSTRACT

An abstract must contain the statement of the problem, the methodology used and statistics if appropriate, the results and findings obtained, and the conclusion/s.

**Keywords:** keyword 1; keyword 2; keyword 3 (List three to ten pertinent keywords specific to the study; yet reasonably common within the subject discipline.)

# ACKNOWLEDGEMENT

The acknowledgement section is a place to recognize and show gratitude to individuals or organizations that have helped you during the process of your work. This can include: 1. Advisors, mentors, and other academics who provided guidance and support. 2. Collaborators who helped with research, writing, and other aspects of the project. 3.) Funding agencies or institutions that provided financial support. 4.) Technical support staff who assisted with tools and resources. 5.) Family and friends who provided emotional support. 6.) Any other individuals or groups who made a significant contribution to the work. 7.) It is important to be specific and sincere in the acknowledgement section, and to mention the role that each person or organization played in the success of the project.

# TABLE OF CONTENTS

[APPROVAL SHEET ii](#_Toc169954553)

[ABSTRACT iii](#_Toc169954554)

[ACKNOWLEDGEMENT iv](#_Toc169954555)

[TABLE OF CONTENTS v](#_Toc169954556)

[LIST OF FIGURES ix](#_Toc169954557)

[LIST OF TABLES x](#_Toc169954558)

[CHAPTER I 1](#_Toc169954559)

[THE PROBLEM AND ITS BACKGROUND 1](#_Toc169954560)

[Introduction 1](#_Toc169954561)

[Background of the Study 1](#_Toc169954562)

[Statement of the Problem 1](#_Toc169954563)

[Objectives of the Study 2](#_Toc169954564)

[Significance of the Study 2](#_Toc169954565)

[Scope and Delimitation 3](#_Toc169954566)

[Definition of Terms 3](#_Toc169954567)

[CHAPTER II 5](#_Toc169954568)

[REVIEW OF RELATED LITERATURE 5](#_Toc169954569)

[To acknowledge and reference the work of other authors in a related study, the researcher should use the APA Format 7th Edition - Narrative Citation. The keywords to be used in this chapter must be enumerated. See the format below. 5](#_Toc169954570)

[Inventory System 5](#_Toc169954571)

[Keyword 2 6](#_Toc169954572)

[CHAPTER III 7](#_Toc169954573)

[RESEARCH DESIGN AND METHODOLOGY 7](#_Toc169954574)

[Research Methods 7](#_Toc169954575)

[Research Locale 8](#_Toc169954576)

[Respondents of the Study 8](#_Toc169954577)

[Software Development Methodology 8](#_Toc169954578)

[Development Process based on the selected SDLC 9](#_Toc169954579)

[Research Instruments 10](#_Toc169954580)

[System Development Tools 10](#_Toc169954581)

[Data Flow Diagram 10](#_Toc169954582)

[Use Case Diagram 10](#_Toc169954583)

[Use Case Diagram 10](#_Toc169954584)

[Technologies to be used 10](#_Toc169954585)

[Software Evaluation 11](#_Toc169954586)

[CHAPTER IV 12](#_Toc169954587)

[PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA 12](#_Toc169954588)

[Presentation, analysis, and interpretation of data involves defining a clear research question or problem, collecting, and organizing data, analyzing the data using statistical methods and tools, presenting the findings through clear and concise visual aids, and interpreting the results in the context of the research question or problem. Deployment and evaluation may also be included, such as conducting a survey to evaluate the impact of the research or presentation. Create a paragraph summarizing the content of this chapter. 12](#_Toc169954589)

[Traditional Process 12](#_Toc169954590)

[Traditional Process 1 12](#_Toc169954591)

[Traditional Process 2 12](#_Toc169954592)

[Development of the System 12](#_Toc169954593)

[Requirements 13](#_Toc169954594)

[Design 13](#_Toc169954595)

[Develop 14](#_Toc169954596)

[Testing 14](#_Toc169954597)

[Deployment 15](#_Toc169954598)

[Review 15](#_Toc169954599)

[CHAPTER V 17](#_Toc169954600)

[SUMMARY, CONCLUSION, AND RECOMMENDATION 17](#_Toc169954601)

[Summary 17](#_Toc169954602)

[The summary is a brief and concise overview of the main findings and key points of the study. It typically includes a brief description of the research problem, objectives, methodology, and findings. The summary should be written in a clear and concise manner and provide a quick and easy-to-understand overview of the study. This must be presented based on the selected and used Software Development Lifecycle. 17](#_Toc169954603)

[Research Methodology 17](#_Toc169954604)

[The summary of the research methodology section provides a brief overview of the research design, data collection methods, data analysis techniques, and any limitations or constraints of the study. It should summarize the key points of the methodology chapter and highlight any unique aspects of the study that may impact the interpretation of the results. 17](#_Toc169954605)

[Summary of Selected Software Development Life Cycle 18](#_Toc169954606)

[Conclusion 19](#_Toc169954607)

[Recommendation 19](#_Toc169954608)

[BIBLIOGRAPHY 20](#_Toc169954609)

[APPENDIX A 21](#_Toc169954610)

[INTERVIEW TRANSCRIPT 21](#_Toc169954611)

[APPENDIX B 22](#_Toc169954612)

[EVALUATION TOOL 22](#_Toc169954613)

[APPENDIX C 23](#_Toc169954614)

[Deployment Certificate 23](#_Toc169954615)

[APPENDIX D 24](#_Toc169954616)

[Routing Form 24](#_Toc169954617)

# LIST OF FIGURES

**[Figure 1](#_Toc146973510)** [SDLC 9](#_Toc146973510)

# LIST OF TABLES

[Table 1 Profile of the Respondents 15](#_Toc121473316)

# CHAPTER I

# THE PROBLEM AND ITS BACKGROUND

## Introduction

The problem and its background are briefly introduced in this section. This part aims to provide context and justification for the research topic. It typically includes an overview of the issues, concerns, or gaps in knowledge that the research seeks to address.

## Background of the Study

In this age when technology is evolving rapidly, the majority of SHS graduates face a lot of challenges in selecting a college course that will align with their career goals and skills that they've learned during senior high school. The process of choosing a course can be overwhelming to them due to the wide array of available programs, and some courses especially universities, do have a specialization on each course. The traditional way of choosing college course that students often rely, is on advices from their teachers, parents and friends like they recommend this course due to various reasons like once they graduate on this course they will earn a high-earning job once they entered this course and other reason is because their parents or other relatives have the same course.

AI has been a revolutionary tool to various industries, and its application in education has proven to be beneficial for enhancing decision-making and makes life easier. One key area where AI can make an impact is in course recommendation systems. These systems can analyze data such as a student's academic performance, skills, interests, and goals to suggest courses that would match to their needs. A course recommendation system not only can aid students in making informed decisions but it can also recommend some learning materials based on that specific course that AI can provide to them and can learn it from their own.

Furthermore, recommending a college course to a student is a good thing because of the skills and career goals that they provide to a system, but they also need some education materials, especially e-books, and some links to a YouTube channel related to the courses that they will choose that they can learn themselves. The Internet has a lot of free online learning and e-libraries that they can find, but sometimes it's hard to find reliable and safe websites that they can find to download the resources they need to find.

## Statement of the Problem

This study aims to develop an AI-Powered College Course Recommendation System that not only can recommend a course to students, but it also provides an access to such materials such as books from the online library and other online resources based on a specific course or field that student's take. The system intends to address the following problems:

1. What are the features and functionalities of the system?
2. What technologies will mostly used and how it should be utilized to achieve the optimal functions and accuracy in the system?
3. What are the methods that can be employed to evaluate the usability, effectiveness of the system?

## Objectives of the Study

The objective of this thesis study is to create a Web-based application that can recommend a college course that not only assists the SHS Students for selecting a college course based on their skills but also providing them with recommended websites or open-source library for self-studying in specific courses or fields. The specific objectives are as following:

1. Design and develop a user-friendly recommendation system web application.
2. Integrating the system with OpenAI’s API for accurate recommendation to students.
3. Identify and implement the technologies for development.
4. Evaluate and test the system for effectiveness and how accurate is the system.

## Significance of the Study

The researchers proposed this study that aims to provide a system that can recommend a college course for SHS students that also provides suggestions for online resources to self-study with, The development of AI-powered Course Recommendation System that will benefit or use the system with the benefactors of this study:

1. **Senior High School Students** - The proposed system will help the students to make an informed decisions about their future by providing some course recommendations based on their academic skills, interests and future careers, once they graduate in Senior High School. Additionally, this will help them also not just in courses but also to equip the students with open source websites and tools, allowing them to explore more about their courses and it can make the student curious and if the student interested.
2. **Future Reseachers and Developers** - This study will provide a basis for further exploration and will gave the future researchers to have an idea into AI-driven systems especially if they focus on the context of education setting. Future research/thesis can build on this system to enhance the system by it’s accuracy and expand the system’s whole functionality, and explore more resources.

## Scope and Delimitation

The scope of this study only focuses on the development of the AskKurso Course Recommendation System, and it is limited only to a specific benefactor of this study, which is the Senior High School students of Eastwoods Academy of Science and Technology. The main purpose of our study is to make an AI-driven system that will benefit SHS students and it can recommend college courses and learning materials that are based on their skills and their future careers.

The researchers identify the task for every entity stated above.

**Administrator:**

1. Login to the system
2. Register new Users
3. Manage Accounts

**Staff:**

1. Login to the System
2. Add new request
3. Print Reports

## 

## Definition of Terms

**SHS**- Senior High School

**AI**- Artificial Intelligence

**OpenAI** - is an American artificial intelligence research organization founded in December 2015 headquartered in San Francisco. They’re known for creating ChatGPT with their GPT-4o, OpenAI o1 Sora, and DALL-E 3

**API** **(Application Program Interface)** - in computer programming consists of computer subprograms, protocols, and other software application development tools. An API enables a software using the methods and processes contained in its source code.

Source:

[OpenAI Wikipedia](https://en.wikipedia.org/wiki/OpenAI) page - <https://en.wikipedia.org/wiki/OpenAI>

[OpenAI](https://openai.com/) - <https://openai.com>

[API - https://tl.wikipedia.org/wiki/Application\_programming\_interface](https://tl.wikipedia.org/wiki/Application_programming_interface)

RRL 1 ( [Jiawei Zhang](https://dl.acm.org/doi/abs/10.1145/3652628.3652767" \o "Jiawei Zhang) et al..)- <https://dl.acm.org/doi/abs/10.1145/3652628.3652767>

RRL 2 (Yu Hsuan Wu, Eric Wu) - <https://ieeexplore.ieee.org/abstract/document/9394113>

RRL 3 (Deepani Guruge et al..) - <https://www.mdpi.com/2306-5729/6/2/18>

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# CHAPTER II

# REVIEW OF RELATED LITERATURE

According to Zhang et al. (2024), the rapid development of AI technology has provided a lot of reliability to people and, at the same time, it has had a huge impact on the traditional counterpart. Interactive learning have become mainstream in the big date era.

Based on [Wu](https://ieeexplore.ieee.org/author/37088835136) (2020), driven by the great success of datasets and experience sharing, people are exploring more precious datasets with diverse features and with a longer time range. The promising reasoning information of student’s grade is expected to assist young students to find the best of themselves and improving their learning outcome and study by experience. A personalized guide for students on course selection is crucial for how they structure professional knowledge and arrange study schedules.

In this digital age, institutions have offered a lot of course selections with overlaps. It faces a lot of challenges to students in selecting their future college courses that match their current knowledge and future personal goals. Although studies shows that have been evaluated on Recommender systems (RS), a review of methodologies used in course RS is still insufficiently explored. To fill this gap, this paper present the methodologies used in course RS along with types of data sources used to evaluate these techniques. (Guruge, 2021)

**Keyword 2**

*Related Literature under Keyword 2*

# CHAPTER III

# RESEARCH DESIGN AND METHODOLOGY

Research design and methodology refer to the plan or strategy that a researcher uses to conduct a study. It includes the specific methods and procedures that will be used to collect, analyze, and interpret data, as well as development of the proposed solution. Add a paragraph summarizing the whole chapter.

## Research Methods

To identify the research method to be used, students should consider the research questions, objectives, and type of data to be collected. Research methods can be broadly classified as either qualitative, quantitative, or a combination of both. Qualitative research methods are used to explore and understand the meaning and experiences of individuals or groups, while quantitative research methods are used to quantify and analyze numerical data.

It is also important to consider the strengths and limitations of each method and to choose the method that is best suited to answer the research question and achieve the research objectives. In some cases, a combination of both qualitative and quantitative methods may be appropriate to provide a more comprehensive understanding of the research topic.

## Research Locale

Research locale refers to the place or setting where the research is conducted. It can be a physical location such as a laboratory, a field site, a classroom, a hospital, a community, or an entire region or country, depending on the scope and nature of the research project.

The research locale is an important consideration in research design because it can affect the sampling method, the data collection procedures, and the generalizability of the research findings. The researcher should carefully select the research locale based on its relevance to the research questions, the availability of research participants, and the feasibility of conducting the study in that location.

## Respondents of the Study

Respondents in a research study are the individuals or groups who participate in the study and provide data or information that is analyzed to answer the research questions. Respondents are also commonly referred to as participants, subjects, or informants, depending on the type of research and the method of data collection. The researchers must identify the total number of respondents including a minimum of 10 IT Professionals. They can also use Slovin Formula to determine the appropriate sample size and reduce the number of respondents needed to represent a target population accurately.

## Software Development Methodology

Software development methodology refers to the process or framework used to design, develop, and deliver a software project for the capstone or final project of a computer science or software engineering program. It encompasses the overall approach, tools, techniques, and best practices for managing the software development life cycle, from requirements analysis and design to coding, testing, deployment, and maintenance.

Diagram

Description automatically generatedThere are various software development methodologies that can be used in capstone projects, such as Agile, Waterfall, Scrum, Spiral, and Rapid Application Development (RAD), among others. The choice of methodology depends on the project's specific requirements, timeline, budget, and team members' skills and experience. It is important for the researchers to choose the appropriate methodology that fits their project needs and to adhere to the principles and guidelines of the selected methodology throughout the project's life cycle. Researchers can cite a related study that supports their selected SDLC. See Format below.

**Figure 1** SDLC

### Development Process based on the selected SDLC

#### Phase 1

Explain the procedure done in Phase 1

#### Phase 2

Explain the procedure done in Phase 2

## Research Instruments

A research instrument refers to the tool or method used by researchers to collect data or information for their study. It can take various forms, such as a questionnaire, survey, interview guide, observation checklist, test, or experiment. See format below.

**Research Instrument 1 –** Explain the selected Research Instrument

**Research Instrument 2 –** Explain the selected Research Instrument

**Research Instrument 3** – Explain the selected Research Instrument

## System Development Tools

System development tools refer to a set of software tools or applications used by developers to design, build, test, and deploy computer-based systems, such as software applications, websites, databases, and other digital solutions. These tools can help streamline the software development process and improve productivity, quality, and efficiency. It includes diagrams such as ERD, EERD, UML Diagrams, Data Flow Diagrams, Mockups and etc.

### Data Flow Diagram

Explain the diagram to be used

### Use Case Diagram

Explain the diagram to be used

### Use Case Diagram

Explain the diagram to be used

### Technologies to be used

1. **Technology 1** - Explain the selected technology.
2. **Technology 2** – Explain the selected technology.

## Software Evaluation

Software Evaluation is the process of assessing the quality and effectiveness of a software product or system. This evaluation is important in ensuring that the software meets the needs of its intended users and performs as expected. To perform a software evaluation, researchers must use a standardized set of criteria defined by the ISO 25010 standard.

# CHAPTER IV

# PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

## Presentation, analysis, and interpretation of data involves defining a clear research question or problem, collecting, and organizing data, analyzing the data using statistical methods and tools, presenting the findings through clear and concise visual aids, and interpreting the results in the context of the research question or problem. Deployment and evaluation may also be included, such as conducting a survey to evaluate the impact of the research or presentation. Create a paragraph summarizing the content of this chapter.

## Traditional Process

Include the traditional process of the selected beneficiary with some figures. Separate processes to Traditional Process 1 - n

### Traditional Process 1

Traditional process description

### Traditional Process 2

Traditional process description

## Development of the System

In this section, the researchers will be demonstrating the activities and actions they have undertaken to develop their project. It is imperative that they adhere to the chosen Software Development Life Cycle. Below is an example of format following Agile Methodology.

### Requirements

The Requirement section should include a list of features or user stories that describe what the software system needs to accomplish. The requirements should be prioritized based on their importance and value to the stakeholders. Proposal Letters, Interview Transcripts, Ocular Visits, Case Studies, and anything related on gathering System Requirements must be included in this section.

### Design

The Design section should include an overview of the system architecture and design, including any relevant diagrams or models. The design should be based on the prioritized requirements identified in the Requirement section, and it should be flexible enough to accommodate changes or adjustments throughout the development process. The section should also include details about how the design will be reviewed and tested to ensure it meets the project's goals and requirements. Additionally, it should describe how the development team will collaborate on the design, such as through pair programming or code reviews, and how they will track progress and manage any issues or conflicts that arise. Finally, the section should outline how the design will be implemented using the chosen Agile methodology, such as through sprints in Scrum, and how it will be continually evaluated and improved as the project progresses.

#### Entity Relation Diagram (ERD)

Diagram Figure and Explanation

#### Data Flow Diagram

Diagram Figure and Explanation

### Develop

In this section, the researchers must answer related questions from the Statement of the Problem that are related to the development of the project. See examples above.

1. **What are the technologies to be used on developing the system?**

Enumerate the technologies used on developing the project. See example format below.

**Technology 1 –** Describe how the selected technology is used on development the project.

**Technology 2 -** Describe how the selected technology is used on development the project.

**Technology 3 -** Describe how the selected technology is used on development the project.

1. **What are the features and functionalities of the System?**

Enumerate the features and functionalities of the project. Explain the features with a screenshot showing the actual feature.

### Testing

The Testing section should include a description of the testing strategy and approach, which should be closely aligned with the system's requirements and design. This section should also include an overview of the various types of testing that will be conducted, such as unit testing, integration testing, and acceptance testing, and how they will be prioritized and scheduled throughout the project's development cycle. The section should also outline how testing will be automated, how test results will be tracked and communicated to the development team, and how defects or issues will be managed and resolved. Additionally, it should describe how testing will be conducted in an iterative and collaborative manner, with regular feedback and involvement from stakeholders, and how the results of testing will inform ongoing development and refinement of the system. Finally, the section should highlight any tools or technologies that will be used to support testing, such as continuous integration and delivery platforms, and how they will be integrated into the overall development process.

### Deployment

Deployment refers to the process of implementing and making the project available for use by the intended audience or stakeholders. The deployment stage typically comes after the completion of the project and involves transferring the project from a development or testing environment to a production environment where it can be accessed and used by the end-users.

### Review

Review refers to the process of critically examining and evaluating the project to determine its strengths, weaknesses, and overall quality. Reviews are typically conducted by a panel of experts or stakeholders who are familiar with the topic and have expertise in the relevant field. Result on the conducted evaluation will be included in this section.

#### Profile of the Respondents

The profile of the respondents in a thesis or capstone project refers to the characteristics of the individuals or groups who participated in the study or provided data for the project. The profile of the respondents is an important aspect of the project, as it provides insights into the demographics and other relevant characteristics of the participants, which can help to contextualize and interpret the findings of the study. Researchers can present the data in a tabular and infographic format.

Explain the contents of Profile of the Respondents before the table caption.

**Table 1** Profile of the Respondents

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#### Functionality Evaluation

In this section, the researchers explain their selected evaluation tool for conducting the Software Evaluation that is specified on the Chapter 3.

##### Statistical tool used

In this section, the researchers explain their statistical tool used on conducting their evaluation.

*Figure – Overall System Evaluation (Must follow format on inserting table / figures)*

*Figure – Evaluation per Criteria (Must follow format on inserting table / figures)*

# CHAPTER V

# SUMMARY, CONCLUSION, AND RECOMMENDATION

The summary, conclusion, and recommendation sections provide an overview of the study's objectives, methodology, findings, and insights for future work in the field. The summary is a brief overview of the study, while the conclusion presents the study's findings and draws conclusions based on those findings. The recommendation section provides suggestions for future work or actions based on the study's findings. Together, these sections serve as critical components of a thesis or capstone project, providing context, insights, and guidance for future work in the field. Provide a short introduction of this chapter in this section.

## Summary

### The summary is a brief and concise overview of the main findings and key points of the study. It typically includes a brief description of the research problem, objectives, methodology, and findings. The summary should be written in a clear and concise manner and provide a quick and easy-to-understand overview of the study. This must be presented based on the selected and used Software Development Lifecycle.

### Research Methodology

### The summary of the research methodology section provides a brief overview of the research design, data collection methods, data analysis techniques, and any limitations or constraints of the study. It should summarize the key points of the methodology chapter and highlight any unique aspects of the study that may impact the interpretation of the results.

### Summary of Selected Software Development Life Cycle

The summary of selected Software Development Life Cycle (SDLC) refers to a brief overview of the specific SDLC model that was chosen to develop the software application for the project. The summary typically includes a description of the selected model's stages, such as planning, analysis, design, implementation, testing, and maintenance. Phases may vary on the selected SDLC. Summarized the activities/tasks done in every phase. See example below using Agile Methodology.

1. **Requirements**

Summarize the activities/tasks done under the Requirement Phase including the outcome.

1. **Design**

Summarize the activities/tasks done under the Design Phase including the outcome.

1. **Development**

Summarize the activities/tasks done under the Development Phase including the outcome.

1. **Testing**

Summarize the activities/tasks done under the Testing Phase including the outcome.

1. **Deployment**

Summarize the activities/tasks done under the Deployment Phase including the outcome.

1. **Review**

Summarize the activities/tasks done under the Review Phase including the outcome.

## Conclusion

The conclusion is a critical section that summarizes the main findings of the study and draws conclusions based on those findings. It should tie together the main points of the study and highlight any important findings or insights. The conclusion should also be based on evidence and data gathered from the study and should provide a clear answer to the research question or problem statement.

## Recommendation

The recommendation section is where the author provides suggestions for future work or actions based on the findings of the study. Think of it like giving advice to someone who might want to continue research or put the findings into practice. The recommendations should be practical, specific, and based on the conclusions drawn from the study. Enumerate the Recommendation below.

1. Recommendation 1
2. Recommendation 2
3. Recommendation 3

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# APPENDIX A

# INTERVIEW TRANSCRIPT

(Summary Transcript)

# APPENDIX B

# EVALUATION TOOL

(Evaluation Tool for User Acceptability)

# APPENDIX C

# Deployment Certificate

# APPENDIX D

# Routing Form