Catholic Kwandong University 2026 Curriculum Computer Software Major

1. Educational Goals

To cultivate interdisciplinary talents who understand people and health through AI and software technologies. The program emphasizes human-centered AI and software that transforms everyday life.

Talent Profile:

• AI Service Front/Data Engineer

Core Competencies:
• Front-end and service development
• Data collection, preprocessing, and visualization
• AI service utilization
• Data literacy and ethics
• Industry practical capabilities

Career Paths:
• Data visualization and dashboard developers/operators in public, educational, and regional industries
• AI-literate developers capable of collecting, processing, and transforming data into practical services

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2. Curriculum Roadmap

Year 1 – Common Foundations:
Students broadly explore AI, data, and software while building confidence in coding and understanding the connection between AI, software, and human life.

Year 2 – Major Foundations:
Students acquire foundational knowledge in web development, data engineering, and software engineering.

Years 3–4 – Advanced Specialization and Capstone:
Students design AI-based convergence services and participate in internships, industry projects, and collaborative capstone design experiences.

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3. Specialized Educational Areas

AI Service Front & Data Engineering:
• Web/mobile frontend development using React and Vue
• Backend APIs and database integration
• Cloud deployment and Docker fundamentals
• Python, Pandas, statistics, and data preprocessing
• Dashboard development and data visualization

• AI model and API integration into services

Industry-Oriented Practical Education:
• Generative AI software development
• Capstone design projects
• Internships and industry collaboration

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4. Major Competencies

MC1 – AI & Data Literacy:
Understanding AI principles, data generation, collection, and analysis.

MC2 – Convergence Problem Solving:
Designing creative software-based solutions for healthcare and community problems.

MC3 – Collaborative Communication & Ethics:
Collaborating ethically with multidisciplinary teams.

MC4 – Intelligent Service Implementation:
Developing and deploying frontend/backend AI-integrated applications.

MC5 – Data Engineering & Infrastructure:
Designing pipelines and architectures for large-scale data processing.

MC6 – Algorithmic Optimization & System Control:
Optimizing algorithms and integrating hardware/software systems efficiently.

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5. Educational Tracks

1) AI Service Development Track
Focused on practical AI web/mobile service development and deployment.

2) Data Engineering Track
Focused on data collection, ETL pipelines, dashboards, and infrastructure engineering.

Students develop portfolios including GitHub repositories, architecture diagrams,
deployed services, and end-to-end data pipelines.

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6. Representative Courses

• Fundamentals of Programming
• Data Literacy and Basic Statistics
• Data Literacy Practice using Python
• Introduction to AI and Software
• Introduction to Data Science
• Principles and Applications of Generative AI
• Software Development using Generative AI
• Fundamentals of Database

• Fundamentals of Web Programming
• Fundamentals of Data Structures and Algorithms
• Introduction to Software Engineering
• Data Acquisition and API Programming
• Generative AI-based Agent Systems
• Data Visualization Practice and Dashboards
• Frontend Frameworks
• Backend Service & API Design
• AI·SW Convergence Capstone Design

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7. Representative Course Translation Samples

Fundamentals of Programming:
An introductory course that teaches Python programming concepts, computational thinking,
and basic problem-solving abilities.

Data Literacy and Basic Statistics:
A course focused on statistical reasoning, data preprocessing, and foundational data engineering skills.

Software Development using Generative AI:
Students learn prompt engineering, LLM frameworks such as LangChain,
API integration, and AI-powered application development.

Backend Service & API Design:
Students learn scalable server architecture, RESTful APIs,
database integration, and security/authentication systems.

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8. Career Opportunities

Graduates may pursue careers as:
• Frontend developers
• Backend developers
• Full-stack developers
• Data engineers
• AI service developers
• Cloud/DevOps engineers
• Digital transformation specialists
• Smart city and public data project professionals
• AI startup developers and planners
