BSE 2210 — Software Design

Assignment 1: Foundations of Modern Software Design (Introduction Unit)

Due: Thursday, September 18, 2025 (Africa/Lusaka)

Submission:

- Push your work to GitHub.
- **Additionally, submit your GitHub repository link using this Google Form:**
  Submission Form

Scenario

The university plans to launch a **Unified Student Experience Platform (USEP)** by 2026.

The platform will include:

- **Academic services**: course registration, timetable management, exam results.
- **Support services**: AI-powered academic advising, financial aid tracking, and loan repayment alerts.
- **Community services**: cultural events calendar, student clubs, and forums.
- **Integration goals**: connect seamlessly with existing LMS and HR systems.

Constraints:

- Budget is limited, so outsourcing options must be considered.
- The platform must serve a **diverse, international student body**.
- University leadership wants "**design that lasts beyond 2025**": scalable, ethical, sustainable.

Your team, acting as **design consultants**, must propose and defend an **introductory design vision** for this platform, focusing on **processes, artifacts, and cultural/business considerations**.

Learning Outcomes

By completing this assignment, you will be able to:

- Explain **software design in 2025** as a process and as an artifact.
- Identify and apply modern **design trends** (microservices, serverless, AI integration).
- Produce and explain simple **artifacts** (UML, ADRs, pipeline diagrams).
- Construct a **business case** and analyze outsourcing options.
- Demonstrate **cultural intelligence** in design thinking.
- Compare **application-first vs. principles-first** approaches.
- Integrate **DevOps and DevSecOps** concepts into early design.
- Defend choices in a **live discussion** with peers.

Deliverables

Part A — Documented Artifacts (Research Output, 30%)

Each team must create a **research dossier** (4–6 pages, Markdown or PDF) stored in GitHub under `docs/report.md` or `docs/report.pdf`.

It must include:

1. **Software Design in 2025**: explain design as **process** and **artifact**, list at least **2 artifacts** relevant to the project (e.g., UML diagram, ADR, mock system overview).
2. **Trends**: explain at least 3 (e.g., microservices, AI-assistants, sustainable architecture) and how they apply to USEP.
3. **Business Case**: define the problem (fragmented services), proposed solution (USEP), expected value (student retention, operational efficiency).
4. **Outsourcing**: explain the 3 types (onshore, offshore, nearshore) and recommend one.
5. **Cultural Intelligence**: give at least 2 concrete inclusivity/diversity requirements (e.g., multilingual UI, accessibility features).
6. **DevOps & DevSecOps**: draw a **basic CI/CD pipeline diagram** for USEP.
7. **AI Awareness**: identify one **AI opportunity** (e.g., advising chatbot) and one **ethical concern** (e.g., bias in career guidance).

Part B — Group Discussion (Live Audio, 70%)

- Record an **8–12 minute MP3**.
- Must be a **single live conversation** (all voices audible at once).
- Each member presents their area, then gets **questioned by peers**.
- Debate sections must feel **interactive, not scripted monologues**.

Discussion must include:

1. **Design in 2025**: process + artifacts.
2. **Trends**: how microservices/AI/etc. fit USEP.
3. **Business Case**: defend why USEP is worth investment.
4. **Outsourcing**: debate pros/cons of offshore vs onshore.
5. **Application-first vs Principles-first**: argue which fits USEP.
6. **Cultural Intelligence**: examples (accessibility, global reach).
7. **DevOps/DevSecOps**: how pipelines help sustainability.
8. **AI & Ethics**: opportunity + risk.
9. **Final Debate**: *"Should AI be treated as a collaborator or a tool in software design?"*

Team Roles

- **Member A — Design & Principles Lead**: design process/artifacts, trends, principles vs application-first.
- **Member B — Business Analyst**: business case, outsourcing analysis.
- **Member C — Culture & Ops Lead**: cultural intelligence, DevOps/DevSecOps, AI & ethics.

All must join the **closing debate**.

Submission via GitHub

1. Create a GitHub repo with all 3 members as contributors.
2. Repo must include folder:

   `BSE2210_Design_GroupXX`

   Example: `BSE2210_Design_Group07`

Repository Structure

```
BSE2210_Design_GroupXX/
├── docs/
│   ├── report.md (or report.pdf with artifacts)
│   └── README.md (team details, contributions, reflections)
└── audio/
    └── discussion.mp3
```

README.md Must Include

- Course code & assignment title.
- Team members' names & student IDs (table).
- Contributions of each member.
- Reflection: how AI was used (if at all), and what remained human-driven.

Marking Rubric (100 Points)

Criteria	Points
Report: completeness of artifacts & trends	15
Report: business case, outsourcing, and pipeline diagram	15
Audio: clarity of explanations	20
Audio: interactive discussion (questions/debate)	20
Audio: business case & outsourcing defense	10
Audio: cultural intelligence & DevOps coverage	10
Debate & critical thinking (AI collaborator vs tool)	5
GitHub submission & README	5

Policies & Penalties

- Audio stitched together (not live) = –20 points.
- Missing contributors in repo = –10 points each.
- Audio <8 minutes = –10 points.
- Late submission = –10 points per 24h (max 72h late).
- Generic AI content without human reflection = penalty.

Deliverables Checklist

- ☐ `docs/report.md` or `report.pdf` with artifacts & research.
- ☐ `audio/discussion.mp3` (8–12 min, natural group conversation).
- ☐ `README.md` with team details & reflections.
- ☐ Repo named `BSE2210_Design_GroupXX`.
- ☐ Google Form submission completed [Form Link].

Tips

- Do research individually, then **meet as a team** to compare notes before recording.
- Ask each other challenging questions during the audio — don't just "present."
- Use artifacts (diagrams, cases) as talking points.
- Be clear, concise, and interactive.