**Course Syllabus  
Implementation of STEM in Business for Sustainable Development Goals 888350  
International College of Digital Innovation, Chiang Mai University  
Semester 2/2023**

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| Course Name | DIN350 (888350)  Implementation of STEM in Business for Sustainable Development Goals |
| Prerequisite | DIN 111 (888111) and DIN 151 (888151) |
| Credits/Hours | 3 (3-0-6) |
| Methods | Onsite |
| LMS | Mango.cmu.ac.th and Microsoft Team |
| Lecturer | 1. Dr. Worawit Tepsan, email: [worawit.tepsan@cmu.ac.thh](mailto:worawit.tepsan@cmu.ac.thh) 2. Dr. Nuthapon Udomlertsakul, email: nathapon.u@cmu.ac.th 3. Dr. Naret Suyaroj, email: naret.suyaroj@cmu.ac.th |
| **Time** | Monday and Thursday 13.00-14.30 |
| **Office Hours** | After class or making an appointment |
| **Course**  **Description** | Implementation of Sciences, Technology, Engineering, and Mathematics (STEM) in businesses for sustainable development goals. The course focuses on the application of digital technologies with other fields of sciences to originate innovations that are useful to business operation and sustainable development. Students will be able to tell apart different fields of knowledge merged within a business. Students will also be able to apply different fields of knowledge into one business that processes high competitive capability, is beneficial to human society and leads to sustainable development. |
| **Course**  **Objectives** | Students are able to   1. Describe principles of STEM in business process. 2. Analyze STEM data in business. 3. Solve problems in business process that results in sustainable development by using STEM. 4. Apply principles of STEM in business. 5. Implement the primary process for being new entrepreneur for sustainable development. |

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| **Course contents** | **No. of Lecture Hours** |
| 1. Relation between business and sustainable development goals (WT)  - Social aspect  - Environmental aspect  - In fulfilling human demands | 3 |
| 2. Mathematics in business for sustainable development goals (NU) | 9 |
| 3. Sciences in business for sustainable development goals (WT)  - Biology (4.5 hrs.)  - Chemistry (4.5 hrs.)  - Physics (4.5 hrs.) | 13.5 |
| 4. Technology in business for sustainable development goals e.g., IoTs, Blockchain, AI (WT) | 4.5 |
| 5. Engineering in business for sustainable development goals (NR) | 4.5 |
| 6. Business initiation for sustainable development goals by using various fields of principles (WT)  - Social problem analysis for business idea initiation  - Utilization of various principles to solve problems in business process  - Assessment of business output, outcome, and impact on sustainable development | 10.5 |
| **Total** | **45** |

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| **Class Schedule** | | | |
| **Week** | **Date** | **Topic** | **Instructor** |
| 1 | Mon, 13 Nov 23 | *Visit Mang.cmu.ac.th and watch the course introduction VDO.* | WT |
| Thu, 16 Nov 23 | Chapter 1: SDG | WT |
| 2 | Mon, 20 Nov 23 | Chapter 2.1 Mathematics for SDGs | NU |
| Thu, 23 Nov 23 | Chapter 2.1 Mathematics for SDGs | NU |
| 3 | Mon, 27 Nov 23 | Chapter 2.1 Mathematics for SDGs | NU |
| Thu, 30 Nov 23 | Chapter 3: Tech for SDGs – Overview of Tech | WT |
| 4 | Mon, 4 Dec 23 | Chapter 3: Tech for SDGs – Machine Learning | WT |
| Thu, 7 Dec 23 | Chapter 3: Tech for SDGs – Machine Learning Applications and SDGs | WT |
| 5 | Mon, 11 Dec 23 | Holiday Constitution Day | - |
| Thu, 14 Dec 23 | Chapter 3: Tech for SDGs – Hands-On Problem 1 | WT |
| 6 | Mon, 18 Dec 23 | Chapter 3: Tech for SDGs – Hands-On Problem 2 | WT |
| Thu, 21 Dec 23 | Chapter 2.2: Mathematics for SDGs | NU |
| 7 | Mon, 25 Dec 23 | Chapter 2.2: Mathematics for SDGs | NU |
| Thu, 28 Dec 23 | Chapter 2.2: Mathematics for SDGs | NU |
| 8 | Mon, 1 Jan 24 | New Year Holiday | - |
| Thu, 4 Jan 24 | Business Idea Initiation Part 1 from Math and Tech | WT |
| 9 | 8 - 14 Jan 24 | Reading week | - |
| 10 | 15 - 21 Jan 24 | Midterm Exam | - |
| 11 | Mon, 22 Jan 24 | Business Idea Initiation Part 1 from Math and Tech | WT |
| Thu, 25 Jan 24 | Chapter SDG activity 1 | PR |
| 12 | Mon, 29 Jan 24 | CMU Commencement Ceremony (No class) | WT |
| Thu, 1 Feb 24 | Chapter 3.2: Science (Chem) – Outside Speaker | WT |
| 13 | Mon, 5 Feb 24 | Chapter 3.3: Science (Chem) – Outside Speaker | WT |
| Thu, 8 Feb 24 | Chapter SDG activity 2 | PR |
| 14 | Mon, 12 Feb 24 | Chapter SDG activity 3 | PR |
| Thu, 15 Feb 24 | Chapter 5: Engineer | NR |
| 15 | Mon, 19 Feb 24 | Chapter 5: Engineer | NR |
| Thu, 22 Feb 24 | Chapter 6: Engineer | NR |
| 16 | Mon, 26 Feb 24 | Makha Bucha Day | - |
| Thu, 29 Feb 24 | Chapter 6: Business Initiation from Engineer | NR |
| 17 | Mon, 4 Mar 24 | Chapter 6: Business Initiation from Engineer | NR |
| Thu, 7 Mar 24 | Chapter 6: Project Presentation | WT |
| 18-19 | 11-24 Mar 24 | Final exam week | - |
|  | **Final Exam:** | | |

**Assignment and Score**

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| **Assignment** | **Lecture Hours** | **Instructor** | **Score** |
| Chapter 2 Mathematics in business Assignment | 9.0 | NU | 15% |
| Chapter 3.1 Biology Assignment  Chapter 3.2 Chemistry Assignment  Chapter 3.3 Physics Assignment | 4.5  4.5  4.5 | Invited  Invited  Invited | 10%  10%  10% |
| Chapter 4 Engineering in business Assignment | 4.5 | NS | 10% |
| Chapter 5 Technology in business Assignment | 4.5 | NU | 10% |
| Chapter 6 SDG Assignment Final Project | 10.5 | WT | 15% |
| Attendance, Participation, and Quizzes |  |  | 20% |
| **Total** | **45** |  | **100** |

**Important:** Most of the assignment will take place during in-class sessions. If you are absent from class, you risk forfeiting all the points for that day.

**Rules for Making Assignments**

* Attendance will be checked in class.
  + You have two allowances for absences in class.
  + There is no makeup option for attendance under any circumstances.
* Several assignments will be completed in class. If you miss a class without prior notification to the instructor and without valid reasons, you will not be able to make up the work.
* Acceptable reasons for requesting makeup assignments include
  + medical reasons with a doctor’s note
  + participation in academic events such as Hackathons or Pitching, with document proof.

**Grading Criteria**

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| **Scores** | **0.00**  **-49.99** | **50.00**  **-54.99** | **55.00**  **-59.99** | **60.00**  **-64.99** | **65.00**  **-69.99** | **70.00**  **-79.99** | **80.00**  **-54.99** | **85.00**  **-100.00** |
| **Grade** | F | D | D+ | C | C+ | B | B+ | A |

**Resources:** Will be provided in class.

**Accommodations**: If you require accommodations, please contact me. I will work with you to ensure needed accommodations are provided as appropriate.