



STUDENT HANDBOOK

Master of Science in
Technology and
Creative Innovation



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WELCOME TO TECHNOLOGY AND CREATIVE INNOVATION

CMKL University would like to introduce you to the Master of Science in Technology and Creative Innovation (M.S.TCI), which aims to connect the brightest students in the fields of Entrepreneurship and Innovation, Technology and Creativity, and equip them with the right knowledge and tools to innovate, transform, and create a long-lasting positive impact. Our professional master's curriculum provides teamwork, hands-on experience, and professional connections by bringing together not only specialists from various fields, but also instructors and professors who are top-level executives and industrial partners.

Graduate Capstone Projects are one of the M.S.TCI's primary areas of focus. Capstone Projects are conceptualized as students from various disciplines working together in teams to push the boundaries of the industry and innovate. Our core values are communication, collaboration, and creativity. M.S.TCI students with original ideas are encouraged to push themselves, work within constraints, and collaborate in teams in order to conceptualize what may later become their year-long capstone projects.

M.S.TCI places a high value on specialists and believes that these specializations make teams stronger and lead to more creative collaborations. As a result, our program is not designed to encourage students to leave their original fields, but rather to provide them with the necessary tools to expand beyond their current boundaries. Students will learn how to collaborate across specializations and disciplines at the M.S.TCI, and they will be better prepared to positively transform future organizations and communities.

Sincerely,

A handwritten signature in black ink, reading "Akkarit Sangpetch". The signature is fluid and cursive, with the first name "Akkarit" and last name "Sangpetch" clearly distinguishable.

Akkarit Sangpetch, PhD

TCI Program Director

CMKL University

PROGRAM OVERVIEW

Mission

To revolutionize higher education and transform the industry by creating entrepreneurial professionals who will become global leaders through research and knowledge, technology, creativity, and innovation.

Vision

The M.S.TCI program aims to be a technology enabler for corporations by developing the skills and expertise needed to solve long-term industry and business problems. Through an outstanding curriculum that prepares all of our students for the twenty-first century, we provide a rigorous academic foundation as well as a practical education.

Degree Offered

Graduates will be awarded a degree of the *Master of Science in Technology and Creative Innovation* (M.S. in TCI) from CMKL University. Students will be supervised by CMKL University faculty advisors who will advise them in developing and defining capstone projects to complete in pursuit of their degree. Based on the student's background and academic goals, the advisors will also assist with the selection of learning activities and other elements of the M.S. in TCI program.

Using Student Handbook

The student handbook is intended to set guidelines and expectations for new and current students in Technology and Creative Innovation at CMKL University. This handbook is not exhaustive and will be subject to revision from time to time. It is the responsibility of each student to read and understand the contents of this handbook to familiarize themselves with the university policies and guidelines. This handbook, along with any revisions, will be posted and announced annually on the university website.

CMKL Statement of Assurance

CMKL University adheres to nondiscrimination policies set forth in Thai national laws and executive orders. The University does not discriminate against a person on the basis of race, color, religion, national origin, gender, sexual orientation, religion, ancestry and belief in admission, employment, or administration of its programs or activities. Inquiries concerning the application of and compliance with this statement should be directed to the office of Admissions and Academic Affairs, CMKL University, 1 Soi Chalongkrung 1, Ladkrabang, Bangkok 10520, Thailand. Obtain general information about CMKL University by calling +66 65 878 5000.

FACULTY INFORMATION

Students in the TCI program will encounter a variety of faculty and staff members throughout the duration of the program. For more details about faculty background and specializations, please visit the university website.

Course Instructors

Supan Tungjitusolmun

Associate Professor, CMKL University

B.S., Electrical and Electronics Engineering, University of Pennsylvania, USA

M.S., Electrical Engineering, University of Wisconsin, USA

Ph.D., Electrical Engineering, University of Wisconsin, USA

Orathai Sangpetch

Assistant Professor, CMKL University

B.S., Electrical and Computer Engineering, Carnegie Mellon University, USA

M.S., Electrical and Computer Engineering, Carnegie Mellon University, USA

Ph.D., Electrical and Computer Engineering, Carnegie Mellon University, USA

Akkarit Sangpetch

Program Director, CMKL University

Director, AI Engineering Institute

B.S., Computer Science, Carnegie Mellon University, USA

B.S., Electrical and Computer Engineering, Carnegie Mellon University, USA

M.S., Electrical and Computer Engineering, Carnegie Mellon University, USA

Ph.D., Electrical and Computer Engineering, Carnegie Mellon University, USA

Sally Goldin

Assistant Professor, CMKL University

Associate Director of Learning Innovation, CMKL University

B.A., Cognitive Psychology, Brown University, USA

M.A., Cognitive Psychology, Brown University, USA

M.S., Cognitive Psychology, Carnegie Mellon University, USA

Ph.D., Cognitive Psychology, Carnegie Mellon University, USA

Irving Gómez Méndez

Assistant Professor, CMKL University

B.Sc., Mathematical Engineering, Instituto Politecnico Nacional, Mexico

M.Sc., Probability and Statistics, Centro de Investigacion en Matematicas, Mexico

Ph.D., Probability and Statistics, Centro de Investigacion en Matematicas, Mexico

Charnon Pattiyanon

Assistant Director of IT, CMKL University

Instructor, CMKL University

B.S., Computer Engineering (International Program), King Mongkut's University of Technology Thonburi, Thailand

M.S., Software Engineering, Chulalongkorn University, Thailand

Ph.D., Japan Advanced Institute of Science and Technology (JAIST), Japan

Pisut Wisessing

Assistant Professor, CMKL University

B.A., Physics and Mathematics, Cornell University, USA

M.F.A., Digital Production Arts, Clemson University, USA

Ph.D., Computer Science, Trinity College Dublin, Ireland

Lorenzo Avi

Assistant Professor, CMKL University

Typography and Graphic Design, Ecole Nationale d'Etudes Superieure de la Cambre, Belgium

M.A., Interior Architecture, Académie Royale des Beaux-Arts de Bruxelles, Belgium

Justin Paulsen

Assistant Professor, CMKL University

B.S., Marketing, Marist College, USA

B.S., Finance, Marist College, USA

MBA, International Business, Bryant University, USA

Dylan Powell

Instructor, CMKL University

B.A. (Hons)., Product Design, De Montfort University, Leicester. UK

M.Sc., Managing Innovation in Creative Organisations, Loughborough University, UK

Kamin Phakdurong

Adjunct Faculty, CMKL University

B.Eng., Information and Communication Engineering, Chulalongkorn University, Thailand

M.S., Integrated Design and Management, Massachusetts Institute of Technology, USA

Panarat Cherntanomwong

Assistant Professor, Department of Computer Engineering, School of Engineering, King Mongkut's Institute of Technology Ladkrabang

Associate Dean of Global Partnerships, CMKL University

Associate Director of Partnerships, AI Engineering Institute

Adjunct Faculty, CMKL University

B.Eng., Telecommunication Engineering, King Mongkut's Institute of Technology Ladkrabang, Thailand

M. Eng., Electrical Engineering, King Mongkut's Institute of Technology Ladkrabang, Thailand

D.Eng., International Development Engineering, Tokyo Institute of Technology, Japan

Peevara Kitchumnongpan

Managing Director, Selladoor Asia Pacific

Adjunct Faculty, CMKL University

B.A., Acting, Birmingham School of Acting, UK

M.A., Creative Producing, Mountview Academy of Theatre Arts, UK

Phanuphong Songkhong

Adjunct Faculty, CMKL University

BFA., Communication Design, King Mongkut's University of Technology Thonburi, Thailand

Priyakorn Pusawiro

Chair, ESIC LAB

Assistant Professor, Department of Computer Science, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

Adjunct Faculty, CMKL University

B.S., Statistics, Chulalongkorn University, Thailand

M.S., Computer Science, Chulalongkorn University, Thailand

Ph.D., Computer Engineering, University of Bremen, Germany

Sampan Nettayanun

Assistant Professor, Faculty of Business, Economics and Communications, Naresuan University

Adjunct Faculty, CMKL University

B.S., Mathematics, Statistics, and Economics, Carnegie Mellon University, USA

M.Eng., Operations Research and Industrial Engineering, Cornell University, USA

M.S., Industrial Engineering and Management Sciences, Northwestern University, USA

Ph.D., Risk Management and Insurance, Georgia State University, USA

Sorakrit Phruthanontachai

Senior Vice President, Technology Division, Bangkok Bank

Adjunct Faculty, CMKL University

B.Eng., Computer Engineering, Chulalongkorn University, Thailand

M.Sc., E-Commerce Technology, University of Sussex, UK

M.S., Information Technology in E-Business Technology, School of Computer Science, Carnegie Mellon University, USA

MBA, Sloan Fellows, MIT Sloan School of Management, Massachusetts Institute of Technology, USA

Tanapon Kitmuti

Adjunct Faculty, CMKL University

B.Eng., Computer Engineering, Kasetsart University, Thailand

M.Eng., Information and Communication for Embedded Systems, Kasetsart University, Thailand

M.Eng., Information and Communication for Embedded Systems, Tokyo Institute of Technology, Japan

Theerawat Klangjareonchai

Creative Technologist and Researcher, ESIC Lab

Adjunct Faculty, CMKL University

BFA., Communication Design, King Mongkut's University of Technology Thonburi, Bangkok, Thailand

M.A., Media Space, Berliner Technische Kunst Hochschule, Berlin, Germany

ENROLLMENT AND DEGREE CERTIFICATION

Enrollment Verifications

The CUBE (cube@cmkl.ac.th) is the primary contact for students regarding enrollment and their time at CMKL University. Students or alumni who would like to request a transcript, enrollment verification, or other information related to their time in the TCI program should contact CUBE.

Leave of Absence (LOA)

Students may request for a leave of absence for a variety of reasons. Students should first contact their academic advisor to discuss their academic plans. They must also contact CUBE to complete the appropriate Leave of Absence form. Not completing the form will result in the full tuition fees being applied to the student account. Going on Leave of Absence does incur a fee to maintain student's records and technological services.

International students who take a leave of absence will lose their Educational Visa and are required to leave Thailand.

Returning from Leave of Absence

Students who are ready to resume their studies must submit their Return from Leave of Absence form to CUBE at least one month before the start of the intended semester of return. Students may return to the TCI program within two years without having to go through academic performance reviews.

International students should start the process at least two months before semester start date to allow time for the visa application.

Degree Certification Process and Commencement

A student must satisfy all degree requirements and have a minimum QPA of 3.0 in the required 96 units being counted towards the graduate degree requirements. At the start of the intended semester of graduation, students are required to submit a request to graduate form with CUBE to be considered a graduation candidate. Final degree requirements verification will be performed and CUBE will proceed with the commencement process.

CMKL University holds a commencement ceremony once a year. Students who satisfy the degree requirements after the annual commencement ceremony will be invited to attend the next ceremony.

Students should update their contact information, including mailing address, and personal email address with CUBE before graduation.

COURSE REGISTRATION

Overview

TCI students are responsible for their academic journey. Students should actively review their degree requirements, and connect with academic advisors, faculty, or staff with any concerns they may have. Students are to create their academic plan in conjunction with their advisors. It is the students' responsibility to know the course registration timeline and register for all the courses that they intend to take for the semester, whether or not they are taking the course for credits.

Student Responsibility

Students are responsible to know the CMKL academic calendar that can be found on CUBE to recognize any important dates during the semester. Students are responsible for their academic progress, and they should seek out their advisor or program staff if they have questions about their degree progress.

Full-Time Requirements

The M.S. TCI is a full-time program. To be considered a full-time student, students must be enrolled in at least 36 units per semester. All international students are required to be a full-time student to comply with their visa status.

Course Load

We recommend students take no more than 36 units each semester. Students who plan on taking more than 36 units should consult with their academic advisor to review the academic plan.

Add/Drop/Withdraw Courses

Students can add and drop courses starting from their assigned registration time until the add/drop deadline via their student account. Students wishing to add a course after the add deadline have to submit the Course Add Request form to CUBE for the approval process.

Students can withdraw from a course before the drop deadline and the course will not appear on the transcript. If students would like to withdraw from a course after the drop deadline, they must submit a Course Withdrawal Request form to CUBE for the approval process. In this case, 'W' will be assigned to the withdrawn course on the transcript. It will not be factored into the QPA, but the units will count towards the total units taken.

After the add/drop deadline, students wishing to file for any request should first communicate with the course instructor about their intentions to file for the request.

Auditing Courses

An audited course will not be counted towards the degree requirements; however, the units will be counted towards the total units.

Students will not receive letter grades for an audited course. Grade 'O' will be assigned on the transcript, indicating an audited course. However, auditors failing to attend and prepare for the classes regularly will receive a blank grade.

To audit a class, students need to register for the course via their student accounts. They then need to communicate with the course instructor about their intention to audit the course. Students will then have to submit the Course Audit Approval form to CUBE to process before the course audit deadline. Once the form has been approved by all parties, it cannot be reversed.

Pass/Fail Courses

Students wishing to take an enrolled course with a Pass/Fail grade instead of a letter grade ('A'-'R') have to submit the Pass/Fail Request form to CUBE to seek approval from their academic advisor before the deadline listed on the academic calendar. Students will receive 'P' (Pass) or 'S' (Satisfactory) for a passing letter grade C or above. Students will receive 'N' for failing the course with a letter grade C- or below. Once a Pass/Fail request has been approved and processed, it cannot be reversed.

The Pass/Fail courses will not be factored into the QPA and will not be counted towards the degree requirements; however, they will be counted towards the total units taken. Required courses cannot be taken for Pass/Fail grade.

Courses with Time Conflicts

Students who wish to register for two courses with time conflicts must first discuss their intention with the instructors of both courses. Once students receive permission from the instructors, then they must forward a written permission from the instructors to their academic advisor and CUBE for record.

Final Exams

All TCI students must attend the final exams or final evaluation activities as scheduled by their course instructors. If students have a scheduling conflict for their final exams, they must discuss the issue with the course instructors directly. Students should first confirm the important course dates before booking any trip as having a purchased airline ticket is not an acceptable excuse for missing a final exam.

ACADEMIC STANDARDS

Grading Policy

M.S.TCI follows the CMKL University grading policy with letter grades 'A' (highest), 'A-', 'B+', 'B', 'B-', 'C+', 'C', 'C-', 'D+', 'D', and 'R' (lowest). Grades lower than C, meaning C- and below, are considered failing grades and will not be counted toward the degree requirements. Required courses, core courses and capstone projects, must be passed with a letter grade of B- or above. If students fail to achieve the passing grade, they have the option to either retake the same course or take another course in its place.

Quality Points Average

Students should maintain a Quality Point Average (QPA) of 3.0 or above to remain in good academic standing. Required courses, core courses and capstone projects, with a letter grade lower than B-, meaning C or lower, will not count toward the degree requirement, and students will have to retake the course or choose another core course to complete.

Incomplete Grade

If students cannot complete assignments for a class due to extenuating circumstances, they need to discuss with the course instructor and get approval to have an "incomplete" grade. Students must provide the course instructor an expected course completion date. The incomplete grade will be changed to failing grade by the end of the following semester automatically.

Final Grade Appeal

If a student believes a final grade has been incorrectly assigned or there has been a mistake in grading, the student should first discuss it with the course instructor. If an agreement cannot be reached, the student may pursue a formal written appeal with appropriate documentation to the program within 14 days of the semester's final grades having been released. The program will issue a written decision on the appeal within 30 days. If the student is not satisfied with this decision, the student may submit a formal appeal to the Vice President within 7 days after receiving the department's decision. The decision of the Vice President shall be final and not appealable.

Academic Probation

Students will receive a warning letter from the department and be put on academic probation when their cumulative QPA is below 3.0 and they have accumulated more than 36 units. Students must meet with their advisors and comply with their recommendations. Once a student's semester and cumulative QPA increase above 3.0, the academic probation will be automatically removed.

Academic Advising

Academic advisors provide administrative support helping you understand the program requirements and track your progress. While the Program Director is in charge of the approval of all matters dealing with the academic program, students are welcome to seek academic guidance from any member of the TCI faculty. Students are encouraged to consult our faculty and staff on both academic and non-academic questions. We will provide referrals to other resources whenever necessary.

Academic Integrity

CMKL University is designed to provide a supportive and productive learning environment for our students. It provides the university's ethical expectations of our students and their rights and responsibilities. As members of the TCI community, students are expected to make choices that reflect integrity and responsible behavior. Students who violate the code of academic conduct are subject to disciplinary sanctions.

Instruction and Communication

Graduate programs at CMKL are conducted entirely in English. M.S.TCI students are required to use English as the media for their academic work and meetings.

The main channels of communication with instructors and staff are through Canvas and email. CMKL discourages students from exchanging personal Line contact with instructors.

M.S. TCI DEGREE REQUIREMENTS

M.S.TCI is a three-semester professional graduate program with defined curriculum choices without a thesis. Students take at least 3 core courses, electives, and capstone project courses in order to satisfy the degree requirements. It is advised that students follow this learning roadmap, however, the roadmap is subject to change depending on the courses offered each semester. Summer does not count as a full semester.

*Total units required for graduation: **96 units***

	Standard M.S.TCI Curriculum	Unit
Semester 1	56-601 Entrepreneurship and Innovation	12 units
	56-602 Fundamentals of Creative Innovation	12 units
	56-900 Capstone Project I	12 units
	<i>Total</i>	36 units
Semester 2	56-603 Improvisational Acting	12 units
	Elective Course	12 units
	56-900 Capstone Project II	12 units
	<i>Total</i>	36 units
Semester 3	56-604 Building Virtual Realities I <i>or</i> 56-605 AI for Business <i>or</i> Elective Course	12 units
	56-900 Capstone Project III	12 units
	<i>Total</i>	24 units
Total Units		96 units

The courses are subject to change without prior notice.

Core Courses

TCI core courses require students to achieve three domains: business and entrepreneurship, design and creativity, and engineering and technology development. To meet the core course requirements, students must enroll in **at least 36 units** of the core courses listed in Appendix A. Additionally, all core courses must be passed with a letter grade of B- or better for the units to count towards degree requirement.

Capstone projects

Taking three semesters of capstone projects is a part of the graduation requirements as students spend time developing their capstone project throughout the duration of their degree. Students take one capstone project per semester and they have to pass the course with a letter grade of B- or better.

Failure to complete their capstone project would result in students having to take an additional semester to satisfy the requirements.

International students cannot extend their student visa to stay for another semester due to failing courses.

Elective Courses

Students can take elective courses of their choice to fulfill the degree requirements. Students must register for the elective courses and receive a letter grade of C or better for the units to count towards the degree requirements. The list of Elective Courses can be found in Appendix B.

International students cannot extend their student visa to stay for another semester due to failing courses.

Independent Study

- For M.S.TCI students

Students who are in good academic standing can opt for independent study. Students need to develop an idea and write a proposal to a faculty member, either inside or outside M.S.TCI, who agrees to supervise their projects. Then fill out the appropriate paperwork available from the Student Services.

- For non-M.S.TCI students

Non-M.S.TCI students, who are interested in registering for an M.S.TCI project, will have opportunities to join a project through the M.S.TCI "open call" which usually happens at the beginning of each semester. Selected students need to sign an agreement detailing their contributions and grading criteria before starting the audition with the project team members and/or project course instructors. Auditioning includes but is not limited to, sharing/creating code samples, writing samples, and portfolio excerpts.

Field Visit

We value hands-on learning, interacting with industry professionals, and behind-the-scenes tours as important parts of the M.S.TCI educational process. Students will have opportunities to join field trips to get an insider look at the creative innovative industry, attend exhibitions, conferences, trade shows, and etc.

Outside Work

Outside employment is allowed but is not an excuse to skip classes or submit assignments late. International students must apply for a work permit through the CUBE at CMKL University.

Students who receive a financial stipend as graduate assistants cannot work outside the department during the same semester.

Intellectual Property

Any intellectual property created by students during the degree shall be owned by the University, subject to the University's intellectual property policy. However, students may request the university's permission to continue working on the intellectual property or exploit through said intellectual property,

subject to the terms and conditions and benefit sharing stated in the University's intellectual property policy.

Non-Disclosure Agreement (NDA)

Students shall be requested to sign a non-disclosure agreement agreeing not to disclose any information received during participation in projects included in the agreement with any non-authorized parties. Signing the NDA shall not cause the signer any issues or lawsuits unless the signer willfully violates the agreement and intentionally disclosing confidential information received during participation to any third parties or made available to the public.

Grant of Rights and Licenses Student Form

When opportunities arise, students might have the opportunity to work in companies learning potential breakthrough technologies that lead to an industrial revolution. Students can use it as their reference and often include a demo of the work for their portfolio review even if a Grant of Rights and Licenses Student Form is not signed.

Graduate Assistant Requirements

Students can apply for Graduate Assistant (GA) positions after their first semester. These positions are mostly related to TCI courses where students need to be approved by the course instructors. M.S.TCI courses only have a GA if there are at least 20 students enrolled in the course. Accepted GAs for the M.S.TCI courses can opt for a financial stipend or course credit.

Other GA positions might be available in the library, labs, or workshops at CMKL University; students will need to be approved by the faculty or staff member in charge of the position. GA openings will be emailed to students as they become available.

M.S. TCI PROJECT AND GROUP POLICIES

M.S.TCI Project Process

Projects are an essential part of the M.S.TCI curriculum. Regular surveys will be used to collect inputs and interests from students. Projects will be offered based on the students' interests and the department's resources. Faculty will work with students to assign roles that resonate with their interests. When projects generate high interest from students for roles, students need to apply with resumes and portfolios to help with the selection.

M.S.TCI Project Course Structure

Student project teams are grouped in a small interdisciplinary team. Artifacts are created for working prototypes and/or proofs of concept that can be demonstrated or eventually lead to the production system. Each project team should design what they plan to create under the supervision of project course instructors.

Students will receive the project course syllabus during their semesters of studies. The project course concept is new to many students. Don't hesitate to ask your project course instructors or M.S.TCI faculty for guidance. Our goal is to help students work effectively and professionally with interdisciplinary team members.

Year-Long Projects

Projects usually take 3 semesters to develop to its completion. Students may choose to spend less time on a project if they have the advisor's permission. The project may end earlier if students and advisors decide to end the project earlier or pivot to a different project.

Students wishing to work on a larger-scale project can spend two semesters on the project. The project instructor and students may decide to end or pivot the project after one semester when the project is not meeting expectations.

Project Purchasing

When a project needs certain types of software, props, or materials that are not available internally, a purchase request should be made through the course instructor with a reasonable lead time. If there is a serious time constraint, a petition can be made directly to the Program Director. Purchases made by students without prior approval will not be reimbursed.

Professional Standards

When representing M.S.TCI or CMKL University for external client meetings, business casual dress is expected. Professional behaviors and punctuality are essential.

UNIFIED PROGRAM

About the Unified Program

The unified program is an alternative pathway for bachelor's degree students who desire to graduate with both bachelor's and master's degrees within 5 years. This unified program enables undergraduate students to start their master's degree journey as soon as the first semester of their bachelor's degree. The student is eligible to enroll and collect one master's degree course per semester at the same time as a student studying for their bachelor's degree, and in the 5th year, students will intensively study master-level courses and do TCI Capstones Project at CMKL University.

Degrees Offered

Students who have completed the degree requirement will be awarded a degree of the Master of Science in Technology and Creative Innovation (M.S. in TCI) from CMKL University and a bachelor's degree from the university partner.

Student Responsibility

Students are responsible for registering for classes during the course registration period as listed on the academic calendar. Students should regularly check their CMKL email for any updates regarding their degree and communication from university. Students should consult with their academic advisor for any assistance regarding their study at CMKL University.

Enrollment

- New students
You may not enroll in more than one graduate program.
- Existing students

You are entitled to continue your studies in each subsequent semester, except for the following conditions.

- You haven't made a payment of the tuition fee and required fees, or the finance department hasn't received a clear payment from you.
- You have been put on academic probation.
- You haven't enrolled in the course prior to the course registration deadline

Course Registration for Unified Program

Students who are completing their bachelor's are subject to the 1 course limit per semester. Their status will be transferred to full-time after the completion of their bachelor's degree, and they will be required to take the full-time course load.

TUITION AND FEES

Once you have accepted the offer to study at CMKL University, you are obligated to follow the payment instruction, and make a timely payment according to the due dates set forth by CMKL University. Tuition fee is subject to an increase each academic year in response to inflation rate.

Students will receive an email notification to their CMKL email account when an invoice is ready for viewing. Any amount not paid by the payment due date is subject to a late fee set forth by the finance department. Required fees are non-refundable.

GRANDFATHER POLICY

New rules will be added to the department policies for improvement when necessary. These changes will be communicated to students before implementation. Students, who matriculated in the program before the new policies, will be governed by the grandfather policies if they are affected by the changes in degree requirements/course offerings.

APPENDIX A: LIST OF PROGRAM CORE COURSES

Entrepreneurship and Innovation (CMKL 56-601) – 12 Units

Students will be able to think strategically about communication and negotiation with shared values in Business and Communication Class. This class will also assist students in sharpening their oral presentation, interpersonal communication, and negotiation skills as leaders. We will look at a variety of case studies as examples of best practices and guidelines based on research and experience.

Fundamentals of Creative Innovation (CMKL 56-602) – 12 Units

Students work on developing a leadership and teamwork mindset. Throughout the semester, workshops and lectures will be given by industry experts and guest lecturers to provide historical context for creative innovation. In this semester-long class, students work in small groups to develop ideas for their Capstone projects. At the annual CMKL Innovation Summit, proposals are developed, and final pitches are delivered to a panel of selected faculty members and industry professionals.

Improvisational Acting (CMKL 56-603) – 12 Units

This class is M.S.TCI's "special sauce." It's the secret ingredient that adds zing to our program and gives you an edge. Taught concurrently with Building Virtual Worlds, Improvisational Acting fosters team building, exercises spontaneity, sharpens focus, and increases listening skills.

Students learn to solve problems on the fly, build from scratch, stretch their imaginations, and overcome inhibitions when communicating publicly, and working with others.

Building Virtual Realities I (CMKL 56-604) – 12 Units

BVR is an introductory but highly intensive and hands-on class in which students are introduced to the development process of mixed reality, augmented reality, and virtual reality experiences. Small teams of students are challenged to create virtual worlds quickly and creatively together using Unity and other industry-standard tools. While this class is highly technical and intensive, it is beginner friendly, and no previous experience is required. *Note: CMKL 56-653 Building Virtual Worlds (9 Units) is considered equivalent to CMKL 56-604 Building Virtual Realities I (12 Units).*

AI for Business (CMKL 56-605) – 12 Units

This course is a comprehensive master's degree course designed to equip professionals with a practical and profound comprehension of AI and its practical applications in the business realm. It aims to facilitate a clear understanding of the business problems that AI can address, explore AI use cases across diverse industries, and present case studies and best practices.

Capstone Project (CMKL 56-900) – 12 Units

The Capstone project course is a significant part of the M.S.TCI curriculum. In this interdisciplinary project course, small teams of students work together to build prototypes and/or develop interactive projects to help solve existing industry problems. Depending on the nature of the projects, some groups may be assigned Capstone clients to work with, while some may work more closely with faculty advisors.

APPENDIX B: LIST OF ELECTIVE COURSES

List of courses and course descriptions are subject to change.

Business and Innovation

Introduction to Blockchain (CMKL 56-610) – 12 Units

We will address the limitations of the Internet for business and economic activities in this first course of the specialization, as well as how blockchain technology offers the way forward. You will be able to explain what blockchain is, how it works, and why it is revolutionary after completing this course. You'll learn about mining, hashing, proof-of-work, public key cryptography, and the double-spend problem, among other topics. You'll be able to explain seven design principles for blockchain technology, as well as the problems that developers face.

Project Management (CMKL 56-611) – 12 Units

Boost your project management skills as you learn how to best manage people, teams, and budgets, and examine the latest trends in project management.

Business Strategy and Analytics (CMKL 56-612) – 12 Units

The students will be introduced to strategies to develop sustaining a business while continuously finding the new growth strategy. Also, they will learn how to develop sustainable business and growth strategies for the firm portfolio.

Marketing Digital Media (CMKL 56-613) – 12 Units

This course is designed to achieve two goals. It offers social analytics tools as well as training to assist you in becoming a social media influencer. The course provides you with the information and resources you need to create a comprehensive social media marketing strategy, from consumer insights to final justification data. In addition, specific toolkits with timely information will be provided in each course, and when you pay for the Capstone, you will receive a market planning toolkit.

Strategic Communication and Negotiation (CMKL 56-614) – 12 Units

In business today, it is inevitable to get into negotiations and communication. Whether giving the presentation to the team or customer or negotiating the business deals, it is necessary for you as the stakeholder to learn how to engage, communicate and negotiate for better with shared value.

Negotiation requires skill and strategic thinking; we need to learn how to strategically create value for our counterparts and effectively communicate the matter so that we aim for distributive negotiation and value claiming, applying the principles of influence and bargaining practice.

In this course, we will learn the fundamental principles of communicating and negotiating strategically, not only the theory and concept but also putting the theory into practice by immersively engaging in presentation and negotiation case simulations.

Intellectual Property Law in Media, Entertainment, and Technology (CMKL 56-710) – 12 Units

Become fluent in the rules of the new economy. The objective of this course is to provide students with a practical understanding of the underlying legal principles of intellectual property laws regulating the creation and exhibition of entertainment content. The class covers the basic legal concepts of intellectual property law, including case studies, but is aimed at non-lawyers and non-law students. In this class, you will learn how to identify the types of intellectual property protection available, analyze and interpret a patent document for a competing product, evaluate your options for protecting

your creative innovations with copyright law, and develop strategies for protecting and maximizing your brand with a comprehensive trademark strategy.

Entrepreneurial Financing and Investing (CMKL 56-711) – 12 Units

Entrepreneurial finance is a special topic for startups and project decision-making. The course provides fundamental tools such as payback period, internal rate of return, discounted cash flow, net present value, and risk management for project analysis. The sources of funding will be discussed in the course. Stakeholders such as angel investors, venture capital, private equity, and crowdfunding will play a role in the financing. The course also provides company analysis through various analytical techniques. The entrepreneur will learn about different ratios and measures in analyzing their business operation. Valuation for business will also be discussed. In addition, the entrepreneur will learn about investing strategies in the equity market and personal financial planning.

Influencer Marketing Strategy (CMKL 56-712) – 12 Units

The class provides a comprehensive overview of the influencer marketing landscape and covers the key elements of planning, running, and reporting on a successful campaign. By completing this class, you'll be able to confidently navigate the new digital advertising format, understand the various influencer archetypes and campaign use cases, and comfortably run a campaign for the brand you represent. The class will cover the fundamentals of influencers and their audiences, discuss effective strategies and budgeting, as well as key campaign insights to save you time and money.

Test Your Startup Idea: Lean Entrepreneurship, Design Thinking, and Rapid Prototyping in Action! (CMKL 56-713) – 12 Units

Learn how to validate your million-dollar startup ideas using well-known methodologies such as Lean Startup and Design Thinking. In this class, students will go through a series of hands-on exercises and learn to use various tools for testing their ideas. Form groups (or go solo if you dare), identify market segments, validate customer needs, and test key assumptions to ensure that you build the right product for the right people. This class will also provide some basic training for tools that are essential for early startup entrepreneurs, such as UI/UX design, analytics, user testing, rapid prototyping, and landing page building, which will be essential for your experiments.

Startup from Idea to Impact (CMKL 56-714) – 12 Units

This course guides students through the full journey of launching a startup, from identifying a compelling problem to building and pitching a viable solution. Students explore ideation, product development, branding, marketing, and leadership through hands-on projects and team collaboration. By the end of the course, each student will have developed a startup concept and gained practical experience in turning ideas into real-world impact.

Gaming Publishing and Marketing (CMKL 56-810) – 12 Units

Game publishing and marketing involve the strategic promotion and distribution of video games to maximize visibility, reach, and sales. Publishers handle various aspects, including funding development, coordinating production, and managing distribution across platforms. Marketing strategies encompass creating compelling trailers, advertisements, and social media campaigns to build anticipation and attract players. Publishers collaborate with developers to ensure games meet market expectations and leverage existing fanbases. Effective marketing identifies target audiences, optimizes visibility on digital storefronts, and cultivates community engagement through events and influencer partnerships. Together, publishing and marketing play critical roles in launching successful games and sustaining long-term player interest.

Creative Design and Technology

3D Modeling (CMKL 56-521) – 6 Units

This competency introduces the fundamental principles and techniques of 3D modeling essentials using industry-standard software for building digital worlds. Students will create three-dimensional objects and environments, focusing on essential modeling tools, topology, and efficient digital asset creation workflows, specifically polygon modeling, subdivision surfaces, NURBS modeling, UV unwrapping, basic texturing, and navigating 3D software interfaces.

3D Appearance: Surfacing, Lighting, and Rendering (CMKL 56-522) – 6 Units

This competency focuses on enhancing 3D model realism by covering surfacing, lighting, and rendering techniques to bring 3D creations to life. Students will explore surfacing for realistic materials and textures, and learn fundamental lighting and rendering principles to achieve desired moods and visual styles, including shader networks, texture mapping, physically based rendering (PBR), lighting techniques (three-point lighting, HDRI), rendering engines, and material creation workflows, building upon prior 3D modeling skills.

3D Animation: Rigging and Animating (CMKL 56-523) – 6 Units

Introducing core 3D animation principles for bringing digital models to life, this competency covers basic rigging techniques for animation-ready skeletal structures. Students apply fundamental animation principles for believable movement, focusing on timing, spacing, and posing, and examining rigging fundamentals (joints, skinning), keyframe animation, animation curves, posing and timing, principles of animation (squash and stretch, anticipation, etc.), and basic character animation workflows, further developing 3D modeling skills.

Motion Capture (CMKL 56-524) – 6 Units

This competency explores motion capture animation technology for translating human movement into digital animation, focusing on capturing human performance. Students gain an understanding of performance capture workflows, data acquisition, and applying captured data to 3D characters, studying motion capture systems (optical, inertial), marker setup and tracking, data cleanup and retargeting, performance capture acting techniques, integrating motion capture data into animation software, and ethical considerations of performance capture.

Game Design (CMKL 56-532) – 6 Units

This introductory competency to core game design principles focuses on crafting engaging player experiences. Through practical exercises and analysis, students explore game mechanics, level design, player experience, game balancing, and the iterative design process, encompassing game mechanics and rules, level design principles, player psychology and motivation, game balancing techniques, prototyping and playtesting, and game design documentation. *Note: Previously listed as CMKL 56-821*

Narrative Design (CMKL 56-533) – 6 Units

This competency focuses on crafting compelling narratives within interactive game experiences. Students explore storytelling techniques tailored for games, character development, world-building, dialogue writing, and narrative integration into game mechanics, including narrative structures in games, character archetypes and development, world-building techniques, dialogue writing for

interactive media, branching narratives, and environmental storytelling. *Note: Previously listed as CMKL 56-729*

Sound Design (CMKL 56-534) – 6 Units

This introductory competency focuses on creating immersive audio experiences for games, emphasizing sound design for player experience. Students will explore sound effects creation, music integration, ambience design, and the technical implementation of audio within game environments, learning sound design principles, sound recording and editing, Foley artistry, music composition for games, interactive audio implementation, and spatial audio techniques.

Game Engine Fundamentals (CMKL 56-541) – 6 Units

This hands-on introductory competency to game development uses the professional Unreal Engine to teach game engine fundamentals. Students will learn the engine's interface, basic scripting, level design tools, and fundamental workflows, covering game engine interface and navigation, visual scripting, level design basics (terrain, lighting), importing assets, basic material creation, and creating simple game interactions.

Advanced Game Mechanics and Techniques (CMKL 56-542) – 6 Units

Building upon Game Engine Fundamentals, this competency explores more advanced game engine features and techniques within Unreal Engine, specifically focusing on advanced game mechanics and development techniques, including advanced scripting, material functions and shaders, advanced lighting techniques, performance optimization, AI and navigation, and creating complex game mechanics.

Crowd AI: Simulating Group Behavior in Games (CMKL 56-543) - 6 Units

This exploration competency focuses on implementing AI-controlled group behaviors within game environments, teaching crowd AI for simulating group behavior in games. Students will learn techniques for creating realistic crowds, flocking simulations, and NPC interactions within group contexts, covering flocking algorithms (Boids etc.), crowd simulation techniques, navigation meshes and pathfinding, group behavior AI, state machines for groups, and optimizing AI for performance.

Character AI: Designing Believable Game Agents (CMKL 56-544) – 6 Units

This competency centers on designing and implementing AI for individual game characters, focusing on character AI for believable game agents. Students will explore techniques for creating believable NPC behaviors and incorporating AI influences, potentially touching upon virtual character technology, examining finite state machines, behavior trees, decision-making algorithms, AI perception (sight, hearing), pathfinding for individual agents, and integrating AI with animation.

Virtual Reality (VR) (CMKL 56-545) – 6 Units

This competency introduces Virtual Reality (VR) technology and its role in immersive media. Students will gain a foundational understanding of VR principles, hardware/software, and interaction design. Specifically, students will learn about VR hardware (headsets, controllers), VR software development kits (SDKs), interaction design specific to fully immersive environments, spatial audio within VR, and user experience considerations in VR. Students will explore the unique aspects of creating and interacting within completely simulated digital spaces.

Augmented Reality (AR) and Mixed Reality (MR) (CMKL 56-546) – 6 Units

This competency introduces Augmented Reality (AR) and Mixed Reality (MR) technologies and their application in blending digital and physical worlds. Students will gain a foundational understanding of AR/MR principles, hardware/software, and interaction design. Students will learn the differences between AR and MR, AR/MR hardware (smart glasses, mobile devices), AR/MR software development kits (SDKs), interaction design for overlaying digital elements onto the real world, spatial understanding, and user experience considerations in AR/MR. This will include learning how to create digital content that interacts with and responds to the user's physical environment.

Introduction to Motion Graphics (CMKL 56-621) – 12 Units

This class will get you started with the basics of creating full Motion Graphics Videos using After Effects, which is widely used in the industry and on modern-day commercials. You'll learn how to apply the most useful visual effects to graphics and video, touch on all After Effects motion graphics properties and methods and master the most useful techniques.

Building Virtual Realities II (CMKL 56-622) – 12 Units

In this course, students will design and develop immersive and interactive experiences with Unity's real-time 3D platform, Oculus Head Mounted Display (HMD), and related technologies. This course will build upon the Building Virtual Worlds (BVW) course, taught by Kamin Phakdurong and modeled after the groundbreaking ETC course by co-founder Randy Pausch. This course seeks to expand upon students' knowledge of the Unity game engine, Unity XR Toolkit, Unity XR Device Simulator, virtual reality (VR) design principles, and Oculus software tools for Quest and Quest 2 (Android) development. By the end of the course, students will have their own unique VR experience prototype to showcase. This course is designed for students to be able to participate online. Lectures, tutorials, and meetings may be conducted using live video, pre-recorded video, Google Meet, Zoom, Mozilla Hubs, Gather, Canvas discussions, Line discussions, and other methods as deemed appropriate by the instructor(s).

Introduction to 3D Modeling and Animation I (CMKL 56-623) – 12 Units

This class introduces the core concepts and tools in 3D modeling and animation using the industry-standard software. Students will learn the fundamentals of 3D modeling, texturing, and basic animation through a series of hands-on exercises. After the class, students will know how to apply their 3D skills in game development and design, animated movies, and 3D printing.

Introduction to 3D Modeling and Animation II (CMKL 56-624) – 12 Units

This class is a continuation of Introduction to 3D Modeling and Animation I, designed to deepen your understanding of 3D tools and production techniques. It delves into the animation industry's business processes, providing comprehensive knowledge and practical insights. By taking this course, you will enhance your professionalism in 3D Modeling and Animation.

Introduction to 3D Pipeline and Universal Scene Description (CMKL 56-625) – 12 Units

Designed for aspiring Pipeline Technical Directors, this hands-on course focuses on building 3D production pipelines using Python and Universal Scene Description (USD). Students will develop practical skills in scripting custom tools to automate workflows and manage complex scene data across different software environments, with a focus on integrating Maya, Houdini, Blender and Unreal Engine. Through project-based learning, you will engineer the robust, efficient, and collaborative systems required to solve real-world challenges in the animation, VFX, and game development industries.

Introduction to Game Development (CMKL 56-626 – 6 Units

This is an introductory course on Game Development, the foundational step toward acquiring the crucial skills required for a successful career in the gaming industry. This course will begin by covering the fundamental aspects of Game Design and Game Business before delving into Game Engines like Unreal Engine, Unity, and Godot. You will need a combination of design and technical engineering skills to enhance your abilities in this field.

Introduction to Virtual Production (CMKL 56-627) – 6 Units

In this course you will learn the fundamentals of cutting-edge technology and gain insights into the future of media production processes. This field is currently receiving significant attention from the global media industry. Virtual Production explores the use of virtual cameras, 3D asset-based environments, and the Unreal Engine, offering valuable techniques and skills for the modern media landscape.

Design Thinking, Innovation, and Creative Confidence (CMKL 56-726) – 12 Units

The fundamental ideas and methods of design thinking will be introduced in this course. Students will practice using several techniques for idea testing through a series of practical exercises in this subject. During the course of the lesson, students will also learn how to identify user groups and customers' needs, translate those needs into product specifications, and create a prototype.

Game Engine Technology (CMKL 56-820) – 8 Units

This course will equip you with the essential technical knowledge to develop a gameplay prototype, covering key aspects such as environments, player navigation, interactions, and the 3Cs (Character, Camera, and Controls). You will apply these concepts by creating a personal game prototype using Unreal Engine 5 and its core functionalities.

Artificial Intelligence and Computer Engineering

TCI students may take elective courses from M.S. AiCE as listed on the M.S. AiCE handbook. Please refer to the M.S. AiCE handbook via the link below.

[M.S. AiCE Handbook](#)



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