



The 12th National Conference on Technical Education
The 7th International Conference on Technical Education

“The Challenge of Disruptive Innovation in Engineering and Technical Education”



March 25, 2020
Faculty of Technical Education
King Mongkut's University of Technology North Bangkok

NCTechEd12 & ICTechEd7

March 25, 2020
KMUTNB Bangkok, Thailand

Organized by



Faculty of Technical Education

King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand

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Education is very important factor for the long-term development of any country. However, the performance and efficiency of education system are relied on education technique and technology. IEEE Education Chapter, Thailand Section, is delighted to co-organize the 7th International Conference on Technical Education (ICTechEd7). This conference is very important and serves as a stage for the innovator, researcher, and educator to present their idea, experimental result and innovation related to the education.

On behalf of the IEEE Education Chapter Chair, I wish the event fruitful deliberation and productive outcomes. I hereby acknowledge the contribution of Assoc. Prof. Dr. Pairote Stirayakorn, Dean of Faculty of Technical Education Technical Education, King Mongkut's University of Technology North Bangkok and his staffs for the arrangement of this great event.

Assist. Prof. Dr. Wattana KAEWMANEE
IEEE Education Chapter Chair

Message from the President

It is an extremely challenging time for Thailand to undertake substantial reforms by accelerating the development of science, technology, research and development, and innovation as key factors in empowering the development of all aspects needed to increase the country's competitiveness with an exceedingly competitive global economy. In today's knowledge-driven economies, King Mongkut's University of Technology North Bangkok encourages research and academic work consequently.

“The 12th National Conference on Technical Education and the 7th International Conference on Technical Education” organized by The Faculty of Technical Education, KMUTNB is deemed in harmony with the university vision and commitment for the sustainable development goals. This undertaking has received substantial assistance from partnership networks includes nine vocational-technical education institutions along with participating universities. Besides, the active and supportive alumni network, enterprise cooperation, and current students have played a valuable role in fostering and carrying out the mission. Such collaboration is a vital element for the expansion of Technical Education into broader careers and academic horizons towards strength and abiding sustainability.

On behalf of the University administration, faculty, and staff, I wish the event fruitful deliberations and productive outcomes. I hereby acknowledge and appreciate the efforts and cooperation of everyone -- faculty members, former and current students of the Faculty of Technical Education, for project collaborative arrangement and coordination. In the meantime, my sincere gratitude is particularly extended to all those who encourage dissemination of knowledge and effective strategy implementation. Undoubtedly, your meaningful endeavors will contribute to the positive development of national studies and research relevant to advanced Engineering and Technical education for years to come.



Professor Dr. -Ing. habil. Suchart Siengchin

President of King Mongkut's University of Technology North Bangkok



Message from Dean

The National Conference on Technical Education was established for the first time in 2008 by Faculty of Technical Education of King Mongkut's University of Technology North Bangkok (KMUTNB). For this time, the 12th National Conference on Technical Education and the 7th International Conference on Technical Education are going to start on 25th March 2020 at the Faculty of Technical Education, KMUTNB. The conference offers an opportunity for researchers, academicians, educators, and traders interested in the area of Vocational and Technical Education, to share their knowledge and experience. "The Challenge of Disruptive Innovation in Engineering and Technical Education".

I trust the conferences devoted to the advancement of innovation in the field of Engineering and Technical Education both nationally and internationally.

On behalf of the Dean of Faculty of Technical Education at KMUTNB, I would like to express my gratefulness to all committees, instructors, staffs, and students of the Faculty of Technical Education for your corporation and assistance in the 12th National Conference on Technical Education and the 7th International Conference on Technical Education to reach its objectives. Especially, thank you to King Mongkut's University of Technology North Bangkok, German-Thai Chamber of Commerce, IEEE Thailand Section and the Association of Industrial Education Thai. Finally, I sincerely appreciate the effort put forth by both Thai and foreign lecturers, specialists, administrators and staffs for arranging this conference.

Assoc. Prof. Dr. Pairote Stirayakorn

Dean, Faculty of Technical Education
King Mongkut's University of Technology North Bangkok

Message from the Conference General Chair

Greetings!

Allow me to warmly thank the organizers of this important conference for giving me the privilege of welcoming and addressing you all. On behalf of the Organizing Committee, we look forward to welcoming you to the 12th National Conference on Technical Education (NCTechEd12) and the 7th International Conference on Technical Education (ICTechEd7) at KMUTNB, Bangkok, on March 25, 2020.

The theme for this year's conference is "The Challenge of Disruptive Innovation in Engineering and Technical Education". Since the coronavirus outbreak began in January 2020, it should force a rethink of how global, digital and connected we should be. We can proudly say that both NCTechEd12 and ICTechEd7 conferences are going with 'disruptive', technology's favorite word, and innovation which is helping mitigate the coronavirus threat. To enhance communication among authors, the organizing committees welcome those authors and participants to join the conference through online presentation sessions.

We look forward to bringing an academic platform between higher institutions and industry, promote research and education to establish a sound foundation for future industries, and capture opportunities from global trends and disruptive technology. As your host, all of us wish you all the best, hoping that you find the conferences informative and worthwhile and continue to engage with the conference series.

We congratulate all of you for your commitment and active participation and wish you success during your time in Bangkok. We hope you will enjoy the content, renew old friendships, make new friends, get new ideas, and above all, have a good time.

Sulya P.

Asst. Prof. Dr. Suchanya Posayanant

General Chair

The 12th National Conference on Technical Education
and the 7th International Conference on Technical Education
Faculty of Technical Education
King Mongkut's University of Technology North Bangkok



Conference Program

The 12th National Conference on Technical Education
and the 7th International Conference on Technical Education

"The Challenge of Disruptive Innovation in Engineering and Technical Education"

Wednesday, March 25, 2020

Time	Details	Places: Building 52, Faculty of Technical Education, KMUTNB
09.00 - 10.15	Registration	Office of the Dean,
10.15 - 10.30	Opening ceremony: NCTechEd12 and ICTechEd7 Awards & Sponsor Recognition for NCTechEd12 and ICTechEd7	[Live] Main Conference Room [Live] Main Conference Room
10.30 - 10.30	Coffee Break	Reception Room* 2 nd Floor,
10.30 - 12.00	NCTechEd12/ICTechEd7 Online Papers Presentation	Conference room* Online Presentation <i>(Coffee break served in the conference room)</i>
12.00 - 13.00	Lunch hosted by FTE, KMUTNB	Reception room* 2 nd Floor,
13.00 - 17.00	NCTechEd12/ICTechEd7 Online Papers Presentation	Conference room* Online Presentation <i>(Coffee break served in the conference room)</i>

Please note that the schedule is subject to change under certain circumstances.

*Update program on <http://icteched.fte.kmutnb.ac.th>
and <http://ncteched.fte.kmutnb.ac.th>

NCTechEd12 Session

วันที่ 1 ห้อง 312		วันที่ 2 ห้อง 313	
รหัส เนื้อหา	ชื่อ เนื้อหา	รหัส เนื้อหา	ชื่อ เนื้อหา
วิศวกรรม และเทคนิคศึกษา		วิศวกรรม และเทคนิคศึกษา	
รศ.ดร.อนันต์/ดร.ต้องชนะ		รศ.ดร.สมศักดิ์/ผศ.ดร.ชัยพล	
10.30-10.50 น.	NC01 ETE01 กิตติ วุฒิจารย์/ ออนไลน์ การออกแบบและสร้างเครื่องสีกะลากาแฟแบบลูกยางขนาดเล็ก	NC24 ETE05 กวนาก แก้วจันทร์/ ออนไลน์ สร้างเครื่องปรับขนาดและขัดเงาเส้นใยตาลโดนด	
10.50-11.10 น.	NC04 ETE02 ณัฐชา สุขสมโภชน์ ชุดการสอนคลังข้อมูลแบบสปริงโอดอะแฟรมแผ่นเดี่ยวด้วยเทคโนโลยีความจริงเสริม	NC10 ETE06 สมศักดิ์ ธนพทธิโรจน์/ ออนไลน์ การศึกษาสภาพปัญหาและปัจจัยที่ใช้ในการเรียนการสอนของครูช่างอุตสาหกรรม สถาบันการอาชีวศึกษาภาคตะวันออกเฉียงเหนือ	
11.10-11.30 น.	NC05 ETE03 รัชชาติ สุพรม ชุดการสอนเกียร์รถยนต์แบบมีปฏิสัมพันธ์	NC12 ETE07 จิโรจน์ สามารถโชติพันธ์/ ออนไลน์ เครื่องบริหารจัดการกฎจราจรโดยใช้อาร์เอฟไอดี	
11.30-11.50 น.	NC07 ETE04 โชคชัย อลงกรณหิภักดิ์ รูปแบบส่งถ่ายความรู้เพื่อพัฒนาสมรรถนะด้านการแก้ไขปัญหาสำหรับกำลังแรงงานระดับเทคนิค	NC21 ETE08 สมนึก วันละ/ ออนไลน์ การออกแบบและสร้างเครื่องผลิตข้าวดอกขี้หนูชนิดแผ่น	
พักรับประทานอาหารกลางวัน			
วันที่ 1 ห้อง 312		วันที่ 2 ห้อง 313	
รหัส เนื้อหา	ชื่อ เนื้อหา	รหัส เนื้อหา	ชื่อ เนื้อหา
เทคโนโลยีสารสนเทศและคอมพิวเตอร์		การจัดการและการบริหารการศึกษา	
ผศ.ดร.กฤษ /ผศ.ดร.ดวงกมล		ผศ.ดร.จรัสพันธ์/ดร.อนิมา	
13.00-13.20 น.	NC13 ICT01 สลิลทิพย์ ต้าดวงดี/ออนไลน์ การพัฒนาหนังสืออิเล็กทรอนิกส์ด้วยเทคโนโลยีโลกเสมือนจริงแบบเรียไทม์เรื่องทรานซิสเตอร์วิชาวิศวกรรมอิเล็กทรอนิกส์เบื้องต้นหลักสูตรครูศาสตร์อุตสาหกรรมบัณฑิต	NC27 EMA01 มนัสพันธ์ รัชมิตระ การวิเคราะห์ความพร้อมในวิชาชีพของนักศึกษาระดับบัณฑิตศึกษา มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ	
13.20-13.40 น.	NC26 ICT02 ศิริวรรณ โกมลสิงห์ การศึกษาปัจจัยที่มีผลต่อการใช้งานอุปกรณ์เคลื่อนที่สำหรับผู้สูงอายุ เพื่อการออกแบบแอปพลิเคชันแบบอุปกรณ์เคลื่อนที่	NC30 EMA02 ทิพย์วิมล คงศิริ/ ออนไลน์ การศึกษาประสิทธิภาพการบูรณาการจัดการเรียนรู้อุปกรณ์ MIAAP กับรูปแบบเชิงรุกเรื่องตัวเหนี่ยวนำ วิชาวิศวกรรมอิเล็กทรอนิกส์เบื้องต้นหลักสูตรครูศาสตร์อุตสาหกรรมบัณฑิต	
13.40-14.00 น.	NC17 ICT03 กนกพร โภคผล/ ออนไลน์ การพัฒนาบทเรียนคอมพิวเตอร์ช่วยสอนมัลติมีเดียในรูปแบบ MIAAP เรื่องตัวเก็บประจุรายวิชาวิศวกรรมอิเล็กทรอนิกส์เบื้องต้นหลักสูตรครูศาสตร์อุตสาหกรรมบัณฑิต	NC11 EMA03 ปราโมทย์ ธรรมกร การประกอบการธุรกิจอาหารแกแอร์ : กรณีศึกษา บริษัท ศรีฟ้าโฟรเซนท์ จำกัด	
14.00-14.20 น.	NC18 ICT04 รัตนศักดิ์ ขุนล่า/ ออนไลน์ การสร้างและหาประสิทธิภาพการจัดการเรียนรู้โดยใช้สื่อการสอนแบบเทคโนโลยีโลกเสมือนจริง 2 มิติผ่านระบบ Google Classroom เรื่องตัวต้านทานวิชาวิศวกรรมอิเล็กทรอนิกส์เบื้องต้นหลักสูตรครูศาสตร์อุตสาหกรรมบัณฑิต	NC20 EMA04 ทรงนคร การนา / ออนไลน์ การพัฒนากิจกรรมการเรียนการสอนเพื่อพัฒนาความสามารถในการจัดทำแผนการสอนที่ส่งเสริมการเรียนรู้ผ่านกลองมือห้าของนักศึกษาช่าง	

		ห้องที่ 1 ห้อง 312		ห้องที่ 2 ห้อง 313	
		เทคโนโลยีสารสนเทศและคอมพิวเตอร์		การจัดการและการบริหารการศึกษา	
		ผศ.ดร.กฤษ / ผศ.ดร.ดวงกมล		ผศ.ดร.จิรพันธ์/ดร.อโนมา	
เวลา	รหัสผู้เรียน บทความ	รหัส บทความ	ชื่อผู้เรียน บทความ	รหัส บทความ	ชื่อผู้เรียน บทความ
14.40-15.00 น.	NC19	ICT05	จฬาวีลย์ รัชญา/ ออนไลน์ การพัฒนาและหาประสิทธิภาพบทเรียนคอมพิวเตอร์ช่วยสอนมัลติมีเดียแบบเกมส์เพื่อส่งเสริมการจำ เรื่อง สัญลักษณ์ทางไฟฟ้าและอิเล็กทรอนิกส์ วิชาวิศวกรรมอิเล็กทรอนิกส์เบื้องต้น	NC34	EMA05 บุณเณษฐ พรหมเพชร/ ออนไลน์ การพัฒนามาบทเรียนคอมพิวเตอร์ช่วยสอนมัลติมีเดีย (MMCAI) โดยใช้รูปแบบการจัดการเรียนรู้แบบเชิงรุก (Active Learning) เรื่องพื้นฐานการเขียนโปรแกรมคอมพิวเตอร์เพื่อเพิ่มผลสัมฤทธิ์ทางการเรียนในรายวิชาโปรแกรมคอมพิวเตอร์ 1 หลักสูตรครุศาสตร์อุตสาหกรรมบัณฑิต
15.00-15.20 น.	NC43	ICT06	คำสิง นันทวง การพัฒนามาบทเรียนออนไลน์แบบสาขีตร่วมกับการเรียนรู้แบบโครงงานเป็นฐาน วิชาคอมพิวเตอร์กราฟิกเพื่อส่งเสริมการสร้างผลงานสร้างสรรค์สำหรับหลักสูตรประกาศนียบัตรวิชาชีพ(สปป.ลาว)	NC31	EMA06 กมลวรรณ สุดแก้ว/ ออนไลน์ การศึกษาประสิทธิภาพการจัดการเรียนรู้ โดยใช้ชุดสาคิดการทำงานของอุปกรณ์อิเล็กทรอนิกส์พื้นฐานสำหรับรายวิชาติดตั้งจุดพื้นฐาน เพื่อส่งเสริมทักษะการปฏิบัติ สำหรับนักศึกษาช่างอุตสาหกรรม
15.20-15.40 น.	NC15	ICT07	ปานตะวัน แสงจันทร์/ออนไลน์ การพัฒนามาบทเรียนคอมพิวเตอร์ช่วยสอนมัลติมีเดียโดยเน้นกิจกรรมการเรียนรู้แบบเกมเพื่อส่งเสริมทักษะการคิดวิเคราะห์ เรื่องหลักการของระบบโทรศัพท์ ในรายวิชาวิศวกรรมโทรศัพท์หลักสูตรครุศาสตร์อุตสาหกรรมบัณฑิต		
15.40-16.00 น.	NC29	ICT08	กาญจนาพร พลายแสง/ ออนไลน์ การพัฒนามาบทเรียนคอมพิวเตอร์ช่วยสอนมัลติมีเดียโดยประยุกต์ใช้เทคโนโลยีQR-Code เรื่อง วงจรแบ่งแรงดัน รายวิชาวิศวกรรมไฟฟ้าเบื้องต้น หลักสูตรครุศาสตร์อุตสาหกรรมบัณฑิต เพื่อเพิ่มผลสัมฤทธิ์ทางการเรียนของนักศึกษาครูช่างอุตสาหกรรม ยุค Thailand 4.0		

				ห้องที่ 3 ห้อง 201	
		รหัสผู้ลงทะเบียน ลงทะเบียน	รหัส ลงทะเบียน	วิศวกรรม และเทคนิคศึกษา	
				ผศ.ดร.กิตติวุฒิ/ดร.ปิยะ	
10.30-10.50 น.	NC06	ETE09	วาริณี วีระสินธุ์ การพัฒนาบอร์ดไมโครคอนโทรลเลอร์เพื่อสนับสนุนการเรียนรู้ทางด้านวิศวกรรมอิเล็กทรอนิกส์		
10.50-11.10 น.	NC32	ETE10	สุรีย์พร นุ่มสำลี การเรียนรู้แบบ Active Learning ทุ่นยขัดและระบบอัตโนมัติผ่านสายกิจกรรม ในพื้นที่ระเบียงเศรษฐกิจพิเศษภาคตะวันออก		
11.10-11.30 น.	NC37	ETE11	นพดล เมืองแก้ว การศึกษาพารามิเตอร์ที่ส่งผลต่อการผลิตแก๊สไฮโดรเจนด้วยวิธีการพลาสมาไมโครโพลีซิส		
11.30-11.50 น.	NC42	ETE12	ปรีชญา เผ่าตะใจ การใ้บอลลูนลื่นึงเพื่อประหยัดพลังงานของเครื่องทำน้ำเย็น		
พักรับประทานอาหารกลางวัน					
				ห้องที่ 3 ห้อง 201	
		รหัสผู้ลงทะเบียน ลงทะเบียน	รหัส ลงทะเบียน	วิศวกรรม และเทคนิคศึกษา	
				ผศ.ดร.สยาม/ผศ.ถิษขม	
13.00-13.20 น.	NC22	ETE13	สุริยาธ เสาวคนธ์ การพัฒนารูปแบบการเรียนรู้ RESPA model สำหรับการศึกษาด้านเทคโนโลยีพลังงานทดแทน		
13.20-13.40 น.	NC28	ETE14	สุปัญญา สิงห์กรณต์ การพัฒนาโปรแกรมจำลองปฏิบัติการระบบสื่อสารโดยใช้ GUI MATLAB		
13.40-14.00 น.	NC36	ETE15	ภูริเมง พะทีหัท การพัฒนาชุดการสอนเรื่อง ทรานซิสเตอร์และการประยุกต์ใช้งาน หลัสดุประกาศนิยมบัตรข้างเทคนิควิทยาลัยเทคนิควิชาชีพสระหวินะเขตสปป.ลาว		
14.00-14.20 น.	NC39	ETE16	นุญทวี ไขยางศ์ การพัฒนาชุดฝึกอบรมเรื่องการควบคุมบนอินเทอร์เน็ตของสรรพสิ่งโดยใช้กระบวนการสอนแบบ MIAP		

				ห้องที่ 3 ห้อง 201	
		รหัสผู้ลงทะเบียน ลงทะเบียน	รหัส ลงทะเบียน	วิศวกรรม และเทคนิคศึกษา	
				ผศ.ดร.สยาม/ผศ.ถิษขม	
14.40-15.00 น.	NC41	ETE17	สิตทักัน สิมมเพ็ด การสร้างและหาประสิทธิภาพชุดการสอนเรื่องการคำนวณสายส่งกำลังไฟฟ้า หลัสดุประกาศนิยมบัตรวิชาชีพชั้นสูงวิทยาลัยเทคนิควิชาชีพสระหวินะเขตสปป.ลาว		
15.00-15.20 น.	NC38	ETE18	ณานกานต์ มาศโอสถ การพัฒนาหลักสูตรฝึกอบรมเชิงปฏิบัติการ การวางแผนงานก่อสร้างด้วยโปรแกรม Microsoft office Project โดยวิธีผสมผสาน		
15.20-15.40 น.	NC40	ETE19	สุราณี แยกรัมย์ย์ การพัฒนาหลักสูตรฝึกอบรมการเขียนแบบคอมพิวเตอร์ด้วยโปรแกรม Revit โดยใช้รูปแบบห้องเรียนกลับด้าน		

ICTechEd7 Session

Time	Room 01 (311A)		Room 02 (311B)	
	Chairman : Asst. Prof. Dr. Nathaporn Utakrit Co-Chairman : Mr. Teeratorn Saneeyeng		Chairman : Assoc. Prof. Dr. Pichet Sriyanyong Co-Chairman : Asst. Prof. Dr. Panee Noiying	
10:30 a.m. - 10:50 a.m.	1G-01	Weerayute Sudsomboon	2G-01	Nuttapon Rothong
		Exploring the Framework of Automotive Service Accuracy Problem Solving Skills Using Artificial Intelligence Technique		ROS based Indoor AMR design and Navigating Application
10:50 a.m. - 11:10 a.m.	1G-02	Chanidapa Boonprasom	2G-02	Kanokwa Ruangsiri
		The Development of Collaborative Learning Management System Using Problem-Based on Cloud Learning to Enhance Critical Thinking.		Promotion of High-Order Analytical Thinking Skills using NCOM Simulator through STEAM Education
11:10 a.m. - 11:30 a.m.	1G-03	Ekkaphan Phacharoen	2G-03	Suporn Thaenkaew
		Learning and Teaching Management of Co-operative Education Systems for Industrial Establishments		Promotion of Advanced Practical Skills Using Disciplinary Integration Teaching and Learning Activity for Electrical Engineering Education
11:30 a.m. - 11:50 a.m.	1G-04	Pinit Nuangpirom	2G-04	Kanyawit klinbumrung
		Self-learning package development on the application of the internet of things to agriculture for the study application		Developing Knowledge and Skills in Science and Technology on Basics Robotics using Activity-based Learning
11:50 a.m. - 01:00 p.m.	Lunch			
	Chairman : Prof. Dr. Panich Voottipruex Co-Chairman : Dr. Ittipon Meepon		Chairman : Prof. Dr. Danai Torrrungrueng Co-Chairman : Asst. Prof. Dr. Kittisak Phaebuga	
01:00 p.m. - 01:20 p.m.	1G-05	Siriphat Maneekeaw	2G-05	Sangwon Kittiwittayapong
		Activation of kaolin Geopolymerization with sodium hydroxide		Experimental-Set for Antenna and Microwave Circuit Laboratory of Undergrad Student
01:20 p.m. - 01:40 p.m.	1G-06	Jirachart Srisaen	2G-06	Nuchanat Chumchuen
		Strength and Microstructures of Phosphate-Based Geopolymers from Bituminous Fly Ash		Developing Affective Competency of Engineering Teachers through Industrial Psychology Concept
01:40 p.m. - 02:00 p.m.	1G-07	Prachya Peasura	2G-07	Nattapong Intarawiset
		Effect of the Solution Heat Treatment on Nickel Base Superalloy GTD-111 Grade After Long-Term Serviced		Development of Learning Innovation of DTV Antennas for Telecommunication Education
02:00 p.m. - 02:20 p.m.	1G-08	Chokchai Alongkrontuksin	2G-08	Kitti Surpare
		Problem Based Learning in Project Course for Actual Work in the Workplace		Effect of STEM Education Approach on Programming Skill in Basic Micro-controller Learning
02:20 p.m. - 02:40 p.m.	Coffee Break			
02:40 p.m. - 03:00 p.m.			2G-09	Kanyawit Klinbumrung Engineering Education Management using Project-Based and MIAP Learning Model for Microcontroller Applications



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NCTechEd12

12th National Conference on Technical Education

Information Technology/ Computer Technology

เทคโนโลยีสารสนเทศและคอมพิวเตอร์

NCTechEd12 ICT01-ICT08

ICT01:NC13

The Development of Electronics Books using Video Augmented Reality Technology on Transistor Subject in Fundamental Electronics Engineering Course, Bachelor of Science in Technical Education

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The objective of this research are to development, to study the learning achievement of learners, to study learning outcome and the satisfaction of learners using electronics books using video augmented reality technology about transistor in subject of fundamental electronics engineering, bachelor of science in technical education.

The population of this research is 1st year students in the field of electronics and telecommunications engineering faculty of Industrial education and technology in Rajamangala University of Technology Srivijaya That were enrolled in the academic 1/2019 of 40 sampling selected. Tools of this research consist of 1) The content and technical quality assessment form of the media by experts 2) The learning achievement test, which is the pre-test and post-test 3) the satisfaction evaluation of learners with the teaching and learning process using electronics books using video augmented reality technology

The results are 1) the quality of electronics books using video augmented reality technology is excellent ($\bar{x}=4.57$, $SD=0.48$). The technical quality is excellent ($\bar{x}=4.95$, $SD=0.09$) 2) academic achievement of learners significantly increased at the level of 0.05 3) students are satisfied with the study by using electronics books using video augmented reality technology for good level ($\bar{x}=4.25$, $SD=0.56$)

Online full paper : <https://is.gd/GBxf5e>



ICT02:NC26

Factors Affecting of Mobile User Experience for the Elderly to Design Elements in Mobile Applications

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The aim of this research was to study Factors Affecting of Mobile User Experience for the Elderly to Design Elements in Mobile Applications. Aging populations are turning to technology rapidly than ever in the last decade. However, the mobile application nowadays is not being designed to help older people users. The current problems are complex features and interface design such as too bright color or small font and button. Therefore, this research has studied around these problems to design and develop tools, collect response data and analyze data. 100 people and 175 participants were involved in this project, and they were the seniors aged 60 years and over who live in Bangkok and the surrounding area. The research instruments consist of the survey and the application prototype for the elderly used in the study of the size and style of the font, color and the button size.

The Key Findings: 1) The result of the size and style of the font found that the header size 30 at 96 percent. In the part of content, the most selected format is TH Bajjam size 26 at 56 percent. 2) The result of the color found that the white background is the most suitable format at 56 percent and the color of font was black at 52 percent. The most selected format for reading is type 1 (white background and black font) at 72 percent, while the most obvious is the type 5 (blue background and white font) at 56 percent. 3) The evaluative results of pressing the button speed found that the best medium button averages at 4.61 second. While, the least of pressing the button speed is the big button at 5.056 second. The implications of this research suggested that these findings can be utilized to generate guidelines for those who would like to design the mobile user experience for the elderly.

Online full paper : <https://is.gd/RUp7yR>



ICT03:NC17

The Development of Multimedia Computer Assisted Instruction (MMCAI) Using MIAP Model Entitled Capacitor in Fundamental Electronics Engineering Course, Bachelor of Science in Technical Education

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The objectives of this research were to 1) develop the multimedia computer assisted instruction (MMCAI) using MIAP model entitled capacitor in Fundamental Electronics Engineering Course. 2) find the efficiency of instruction with the multimedia computer assisted instruction (MMCAI) using MIAP model entitled capacitor in Fundamental Electronics Engineering Course. 3) find the learning achievement of learners with the multimedia computer assisted instruction (MMCAI) using MIAP model entitled capacitor in Fundamental Electronics Engineering Course and 4) study the satisfaction of learners who were taught by the multimedia computer assisted instruction (MMCAI) using MIAP model. The samples used were 24 first year students who registered in Fundamental Electronics Engineering Course for the first semester of academic year 2019. The researchers selected the purposive sampling. The research tools used in this study were 1) the quality evaluation forms of multimedia computer assisted instruction (MMCAI) using MIAP model by the specialists. 2) pre-test, exercise and post-test and 3) the satisfaction surveys of learners. The study revealed that 1) the content quality of multimedia computer assisted instruction (MMCAI) using MIAP model was at high level (\bar{x} = 4.06, S.D. = 0.37) and the technique quality of multimedia computer assisted instruction (MMCAI) using MIAP model was at high level (\bar{x} = 4.31, S.D. = 0.25). 2) the efficiency of instructional process with the multimedia computer assisted instruction (MMCAI) using MIAP model was 83.61/88.33 that was higher than the specified criterion at 80/80. 3) learning with multimedia computer assisted instruction (MMCAI) using MIAP model made the learners have higher achievement significantly at the statistical level of .05 and 4) the learners' satisfaction on multimedia computer assisted instruction (MMCAI) using MIAP model was overall at high level (\bar{x} = 4.44, S.D. = 0.64).

Online full paper : <https://is.gd/a4wML9>



ICT04:NC18

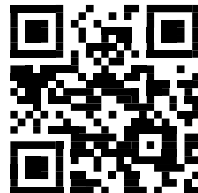
Creating and Searching Effectiveness for Teaching Media using 2D Augment Reality via Google Classroom for resister in Subject of Fundamental Electrical Engineering for Bachelor of Science in Technical Education

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The objectives of this research were to create, search effectiveness, investigate the student's achievement and to study the student's satisfaction of the teaching media using 2D Augment Reality via Google Classroom for resister in subject of fundamental electrical engineering for bachelor of science in technical education. The sample groups were undergraduate freshman students, who in subject of fundamental electrical engineering to increase learning achievement for bachelor of science in technical education, 1st semester of academic year 2019, department of industrial engineering with total amount of 24 students with selection of purposive sampling. The research tools used in this study were: 1) the quality evaluation forms of 2D Augment Reality via Google Classroom 2) pretest and posttest 3) the survey satisfaction of learners. The result indicated that 1) the content quality of learning the teaching media using 2D Augment Reality via Google Classroom was good level ($\bar{x}=4.21$, $SD=0.5$) 2) and the technical quality was good level ($\bar{x}=4.33$, $SD=0.59$) 2) the effectiveness of the teaching media using 2D Augment Reality via Google Classroom was 83.33/86.67 that was higher than the specified criterion at 75/75 3) learning with 2D Augment Reality via Google Classroom made the learners have higher achievement significantly at the statistical level of .05 4) the satisfaction of learners on 2D Augment Reality via Google Classroom was very good level ($\bar{x}=4.58$, $SD=0.51$).

Online full paper : <https://is.gd/MBd1AC>



ICT05:NC19

Developing and Finding the Effectiveness of Computer Assisted Instruction for Multimedia Game to Promote Recognizing of Electrical and Electronic symbols for Basic Electronic Engineering Subject

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The objective of this research are to develop, to find the Effectiveness, to study the achievement of learners and to study satisfaction of learners via computer assisted instruction for multimedia game to promote recognizing of electrical and electronic symbols. Tools of this research are 1) the quality evaluation form of the media expert 2) Pre-test and Post-test 3) exercise during study 4) questionnaire for learners satisfaction. The population of this research is 1st year students of the program in electronics and telecommunications engineering that enrolled in the basic electronics engineering subject for semester 1/2019 of 30 sampling selected

The result are 1) the quality of the computer assisted instruction is good (\bar{x} = 3.56, SD = 0.52) the quality of technique is good (\bar{x} = 3.71, SD = 0.60) 2) the effective of the teaching and learning process using basic demonstration sets is 85.83/90.83 percent , which is higher than the standard set of 75/75 3) learning with the computer assisted instruction get higher achievement with statistical significance at the level of .05 4) the learners are satisfy for the demonstration sets with very good level (\bar{x} = 4.76, SD = 0.47)

Online full paper : <https://is.gd/5wxqk6>



ICT06:NC43

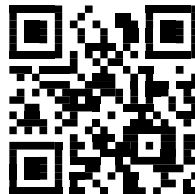
The Development of Demonstration Computer-assisted Instruction with Project-based Learning for Computer Graphics to Promote Creative Product for Certificate of Technical-Vocational College, Lao PDR.

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This research has purpose: 1) development online lessons with demonstration and project-based learning as a computer graphic course, to encourage the creation of creative works for the syllabus vocational Certificate Lao PDR. 2) Determined the effectiveness of online lessons with demonstration and project-based learning as a computer graphic course, to promote the creation of creative works for have developed a syllabus vocational certificate Laos PDR. 3) Find out the learning achievement of learners before and after learning by the demonstration online lesson combine with that is developed project-based learning. 4) Evaluate the creative work after using the demonstration online lesson together with project learning as base that the learners design and develop. The samples used in this research. They are students who study in the first years of branch Technology Information, Semester 2, the academic year 2562, Technical-vocational College Khammouane Province Laos PDR, amount 42 people and using experimental design One-Group Design. the tools used in this research such as demonstration online lessons connection with project-based learning before the test. The tests after during the learn and the creative evaluation of the students, the research founds that 1) online lessons from demonstration together with project-based learning were computer graphics subjects that have created as effective as 81. 43/81. 62, which is higher than the assumption set is 80/80. 2). The progressive learning achievement of the post-test score was higher than pre-test with statistically significant at .05 and 3).The results of the creative evaluation that the students have designed and developed after learning by using the online lesson form demonstration together with the project-based learning of computer graphics subject have an average 4.13 (high level), which is a criteria at high level of researcher.

Online full paper : <https://is.gd/Fz2V1G>



ICT07:NC15

The Development of Multimedia Computer Assisted Instruction Using Games-base Learning Activities and Promoting critical Thinking skill On principles of telephone systems, Telephone Engineering Course of Bachelor of Education in Industrial Technology Program

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The objectives of this research were to develop, search effectiveness, and to study the student's satisfaction of the multimedia computer assisted instruction using games-based learning activities and increasing for analyzing skill on principles of telephone systems in subject of telephone engineering for bachelor of education in industrial technology. The sample groups were undergraduate senior students, who in subject of telephone engineering to increase learning achievement for bachelor of science in technical education, 1st semester of academic year 2019, department of industrial engineering with total amount of 30 students with selection of purposive sampling method. The research tools used in this study were: 1) the quality evaluation forms 2) examination and posttest 3) the survey satisfaction of learners.

The result indicated that 1) the Content quality of learning the multimedia computer assisted instruction using games-based learning activities and increasing for analyzing skill on principles of telephone systems in subject of telephone engineering for bachelor of education in industrial technology was good level (\bar{x} = 3.90, SD = 0.52) and the technical quality was good (\bar{x} = 4.00, SD = 0.66) 2) the effectiveness of the multimedia computer assisted instruction was 94.74/94.67 from assignment 75/75 3) the satisfaction of learners on teaching media was high level (\bar{x} = 3.76, SD = 0.51).

Online full paper : <https://is.gd/wsd9EH>



ICT08:NC29

The Development of Multimedia Computer Assistant Instruction Using by QR-Code Technology on Voltage Divider Circuit Subject in Fundamental Electrical Engineering Course, Bachelor of Science in Technical Education to Increase Achievement the Learning for Industrial Teachers Thailand 4.0 Era

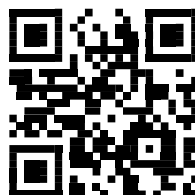
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The objectives of this research were to 1) Develop the Multimedia Computer Assistant Instruction using by QR-Code Technology on Voltage Divider Circuit Subject in Fundamental Electrical Engineering Course 2) to investigate the student's achievement who are attending on Multimedia Computer Assistant Instruction using by QR-Code Technology on Voltage Divider Circuit Subject in Fundamental Electrical Engineering Course 3) to study the student's satisfaction who are attending of Multimedia Computer Assistant Instruction using by QR-Code Technology on Voltage Divider Circuit Subject in Fundamental Electrical Engineering Course. The sample groups used in this study are undergraduate students year 1, who enrolled in the Voltage Divider Circuit Subject in Fundamental Electrical Engineering Course of Bachelor of Science in Technical Education, semester 1 of academic year 2019, department of industrial engineering with total amount of 24 students by using a selection of purposive sampling. The research tools used in this study were: 1) the quality evaluation forms of Multimedia Computer Assistant Instruction 2) A pretest and posttest and 3) the satisfaction surveys of learners.

The finding indicated that 1) the content quality of learning Multimedia Computer Assistant Instruction using by QR-Code was at the good level ($\bar{x}= 3.80$, S.D. = 0.50), And the technical quality is good level ($\bar{x}= 3.94$, S.D. = 0.64) 2) the achievement of learners after learning was good than the achievement of learners before learning after learning with the Multimedia Computer Assistant Instruction using by QR Code significant at the .05 level, and 3) the satisfaction of learners on Multimedia Computer Assistant Instruction was at the very good level ($\bar{x}= 4.69$, S.D. = 0.28).

Online full paper : <https://is.gd/Pe6Buj>





Engineering and Technical Education

วิศวกรรมและเทคโนโลยีศึกษา

NCTechEd12 ETE01-ETE19

ETE01:NC01

The Design and Invention of Small Coffee Milling Machine Rubber Roller

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Nowadays, parchment coffee processing that giving coffee extracts. The coffee extract is costly than the parchment coffee itself. Due to many steps of coffee processing, the coffee extracts are damaged from its milling, leading to low quality of coffee extracts. From these information, we now design and invent a coffee milling machine by using a rubber roller instead of a metal roller. It's a compact and small machine. We use the rubber roller roll tightly with another rubber roller at different speed. It's the same concept with rice milling. So the coffee shell could easily fall off and be blown separately from the coffee bean. Logically, the coffee shell is lighter than its bean, so the coffee beans will fall down. The experiment of the efficiency of this compact coffee milling machine, it shows the machine mill the parchment coffee on the average at 23.43 kilograms per hour and get coffee beans at 83.99%, coffee shell 15.6% and damaged 3.51%.

Online full paper : <https://is.gd/2ItLpw>



ETE02:NC04

Instructional Package of Single Plate Diaphragm Spring Clutch with Augmented Reality Technology

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The objectives of this research were to construct, to determine the quality and efficiency of instructional package of single plate diaphragm spring clutch with augmented reality technology, to determine the learning achievement of learner and satisfaction level to the instructional package of single plate diaphragm spring clutch with augmented reality technology. The research tool were demonstration set of single plate diaphragm spring clutch and computer assisted instruction of single plate diaphragm spring clutch with augmented reality technology, learning achievement test set, and satisfaction level assessment form. The learning achievement test set has been the results of the index of congruence between 0.60 - 1.00, and discrimination between 0.20 - 0.80, and 0.40 - 0.80 for difficulty, and reliability was 0.87. The sample group in this project were 30 students of the 1st year in academic year 2017 at Department of Mechanical Technology Educational by purposive sampling. The statistic used for analyzed were mean, standard deviation, percent of test and t-test. The research results were showed as follows: 1) The quality of demonstration set of single plate diaphragm spring clutch was average in very good level (\bar{x} = 4.56, S.D. = 0.07). The quality of computer assisted instruction of single plate diaphragm spring clutch with augmented reality technology was average in very good level (\bar{x} = 4.55, S.D. = 0.11). 2) The efficiency of computer assisted instruction of single plate diaphragm spring clutch with augmented reality technology (E1/E2) from calculation was equal 86.78/84.11, which this result above the criterion 80/80. 3) The learning achievement of students from using instructional package of single plate diaphragm spring clutch with augmented reality technology by using t-test from calculated equal 30.56 which compared t-test from the table of t-distribution equal 1.699 (30.56>1.699) at significance level .05. 4) The satisfaction levels of learners towards the instructional package of single plate diaphragm spring clutch with augmented reality technology was at most level (\bar{x} = 4.63, S.D.= 0.04).

Online full paper : <https://is.gd/JaJMT5>



ETE03:NC05

Instructional Package of Automotive Manual Transmission with Interaction

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The objectives of this research were to construct the instructional package of automotive manual transmission with interaction, to determine the quality and efficiency, to determine the learning achievement and satisfaction level of the students after using the instructional package of automotive manual transmission with interaction. The research tools were gear working model with interaction and computer assisted instruction of automotive manual transmission. The learning achievement test of computer assisted instruction has been the result of the congruence index between 0.80 - 1.00, and discrimination between 0.20 - 1.00, and 0.20 - 0.80 for difficulty, and reliability was 0.89. The sample group in this project were 30 students of the 1st year in academic year 2018 at Department of Mechanical Technology Educational by purposive sampling. The statistic used for analyzed were mean, standard deviation, percent of test and t-test. The research results were showed as follows: 1) The quality of gear working model with interaction was average in very good level ($\bar{x}= 4.82$, S.D. = 0.03). The quality of computer assisted instruction of automotive manual transmission was average in very good level ($\bar{x}= 4.70$, S.D. = 0.13). 2) The efficiency of computer assisted instructional package of automotive manual transmission with interaction (E1/E2) from calculation was equal 85.33/83.11, which this result above the criterion 80/80. 3) The learning achievement of students from using instructional package of automotive manual transmission with interaction could improve the learning achievement at significance level .05. 4) The satisfaction levels of learners towards the instructional package of automotive manual transmission with interaction was at most level ($\bar{x}= 4.67$, S.D. = 0.13).

Online full paper : <https://is.gd/H0Tg2f>



ETE04:NC07

Knowledge Transfer Model for Improving Problem Solving Competency for Technical Work Force

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In this current, the labor problems are both quantitative and qualitative that are increasing. Therefore, this research aims to study the context in the technical labor force system, review of literature that related to the knowledge transfer, to develop competencies in solving problems for technical labor force, and to synthesize the research concept framework. Starting from the study the context and problem of labor force both domestically and internationally, review of related literature, and synthesizing the conceptual framework of research on the knowledge transfer model for improving problem solving competencies for technical level work force by interviewing executives and supervisors in industrial sector which the conceptual framework of this research consists of creating a competency unit, conversion of competency units into a competency based training package, assessment of occupational qualifications for technical labor force, transferring occupational qualifications to academic qualifications and problem based training as a base according to the SECI model in order to achieve problem-solving performance for the technical work force. The results of interviews with executives and supervisors in industrial sector presented that the characteristics of technical work force in term of analytical thinking ability were an average of 2.91 and S.D. = 0.28. The problem solving ability were an average of 3.00 and S.D. = 0.42. The manageable ability were an average of 3.00 and S.D. = 0.42. The abilities in three terms is at a moderate level.

Online full paper : <https://is.gd/Rv6Y6e>



ETE05:NC24

The Build a Machine Resize and Polished the Fibers Palmyra

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The processing of raw materials used to make wickerwork is an important development in making wickerwork because the use of small strands of material such as the rattan weaving in the area of allows humans to create wickerwork in the desired shape And more exquisite Ban Bo Mai Agricultural Housewife Group, Sathing Phra District, Songkhla Province, says that it has invented the process of processing sugar fibers into various products with government agencies to help promote This is the period when the government promotes community handicrafts or OTOP, a famous handicraft product in the southern region. But in the production there are many problems with raw materials and production technology. Adjusting the size of the fibers to suit their needs. The process is complicated and time consuming from the above problems, the problem was solved by researching the machine, sizing machine and polishing the palm tree fibers to adjust the size of each type of handicraft. Promoting OTOP for the community Ban Bo Mai Agricultural Housekeeper Group, Sathing Phra District, Songkhla Province The objective of this research was to construct a sizing and polishing machine for palm tree fibers. To find the efficiency of sizing and polishing machine for palm sugar fibers and satisfaction, users of palm sizing and polishing machine of results for analysis of efficiency of sizing and polishing machine for palm tree fibers at a speed of 1,450 RPM. Stabilized, tested 5 times and then used for efficiency of the sizing and polishing machine for palmyra fibers Shows the results of finding the efficiency of the 5 sizing and polishing machine for palm tree fibers, 88.8% efficiency of the sizing machine by evaluating the satisfaction of users of the sizing and polishing machine for 3.23 at very good levels.

Online full paper : <https://is.gd/Wq4toI>



ETE06:NC10

Study of the Status Problems and Factors Using in Learning and Teaching for Industrial Teachers Vocational Education Institute: Northeastern

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The aims of this research were to investigate the status problems and factors using in learning and teaching of industrial teachers, Vocational Education Institute: Northeast, and to find solution of the problems according to the factors that are on the learning and teaching. The questionnaire was created for this research which consists of 5 fields that was included 1) learning management model and teaching method, 2) publications media and instructional materials, 3) supporting factors, 4) teacher attitudes, and 5) problems and obstacles which it has 40 questions. Then, we created a conformity assessment with various aspects in the questionnaire and the structure and suitability assessment of questionnaire were created for 3 experts. The results of assessment found that all of the questions were consistent and the structural question appropriate has arithmetic means 0.67 and 1.00. After that, improvement the questionnaires were used for 65 samples of industrial teachers selected from 13 colleges consist of technical colleges, vocational college, and polytechnic college in the groups of electrical, electronics, and computer technology in 5 provinces, namely Ubonratchathani, Mahasarakham, Sakonnakhon, Loei and Nongkhai under the Vocational Education Institute: Northeastern. The results of this research revealed that the most opinions of the samples towards the questions in publications and teaching aids that are suitable for the learning and teaching at a high level ($\bar{x}=4.39$), following by the attitude of the teachers towards learning and teaching was at a high level ($\bar{x}=4.29$), and the overall average was 4.06 which had at a high level of the opinions. The problems encountered in the teaching and learning process included, there have a lot of subjects and many hours of an instructor, the most insufficient of tools and the equipment to use in teaching and learning. The result of this research can be use as a guideline in the learning and teaching of industrial teachers has more quality and efficiency

Online full paper : <https://is.gd/P1ro52>



ETE07:NC12

The Classroom Key Management Machine Using RFID

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This research aims to create and evaluate the classroom key management machine using RFID. The operation machine controlled by microcontroller, where the user information and classroom key information signal are received from RFID card. The received operation functions are selected from the keyboard, after that the microcontroller execute and write data in to EEPROM. Then, the information result is show on LCD, where the classroom key status is presented on the LED. Finally, microcontroller controls all the mechanisms. The result found that the classroom key management machine using RFID work well for classroom key borrowing-return. It can display the borrower information and status of classroom key and, the operation error is not found. The satisfaction of 6 teachers was very high level ($\bar{x}=4.52$) . In conclusion, the classroom key management machine using RFID can be used effectively for classroom key managements.

Online full paper : <https://is.gd/5yvu6U>



ETE08:NC21

The Design and Build of Popped Rice Sheet Pressing Machine

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The purposes of this research are to design and build the popped rice sheet pressing machine. This machine is suitable for a group of processing farmers in community level, small and medium-sized community enterprise to increase rice value. Including, finding the work efficiency of the popped rice sheet pressing machine that is controlled by electronic control circuit and study the satisfaction level of the sample. The sampling groups with rice processing safety farm in Phrae province. The tools of this study are the popped rice sheet pressing machine in plate type. The satisfaction level of questionnaire, analyse the data for mean, standard deviation, percentage and analyse the data with the program by Dr.Pakorn Prajunban.

From the study, it was found that the working efficiency of the popped rice sheet pressing machine, pressing testing by using squeeze the objects to press some rice together tightly by pressing of 50 in different duration. In the testing, the popped rice husks with processing. The average weight is 506 grams. The time used for pressing the popped rice sheet is 111 seconds. The average working rate is 4.69 kilograms / hour. The average of efficiency machine is 18.7 (kg / h.kw). The break-even point of the machine (P) is worth 85,000 baht. The usage period is 5 years. When it's due the residual value of the machine (S) will be 8,500 baht. 10% of machinery price the cost of repair and maintenance (R&M) is 1.5%. The operating cost is equal to 12.75 baht / hour. The electricity rate is 1.125 baht / hour with the amount of raw materials operation (kg/year). It will have a breakeven point of using at 44 kg / year, the average using of the machine is 5 years, and the average operating capacity of the machine is 4.69 kg / hour. The operating the machine for 4 hours per day, it will get 18.76 kg. The data analysis of the samples showed a high level of satisfaction with the usage of the popped rice sheet pressing machine in all aspects. It will be able to produce new products without oil in the production processing, therefore is a useful snack and suitable for health lovers and someone have to diet etc.

Online full paper : <https://is.gd/LYyouuH>



ETE09:NC06

The Development of Microcontroller Board for Supporting in Electronic Engineering Learning

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This research aims to develop microcontroller board for supporting in electronic engineering learning, to provide students with a better understanding of the programming used to control the microcontroller board. It is also used to improve and develop modern teaching media consistent with current technology. The research instrument was personal computer, microcontroller board, worksheet and satisfaction questionnaire. The samples group consisted of 23 students who registered in semester 1/2019 for microcontroller and applications subjects, faculty of Industrial Education of Rajamangala University of Technology Phra-Nakhon were selected purposively. The results showed that the experts evaluated the quality of the microcontroller board usage the average value equal to 4.06 was at high level of the satisfaction of students with use of microcontroller board was at high level with total average of 4.28. Therefore, the microcontroller promote learning for electronic engineering developed can be applied to the management of electronic engineering education as well.

Online full paper : <https://is.gd/GNhGLN>



ETE10:NC32

The Active Learning Based on Robot and Automation Camp Activities on EEC School Students

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This article presents an initiative that is based on active learning pedagogy by engaging with High School and Technical Vocational students in the robot and automation programming development field. The case study presented in this article is about student learning experiences during their participation in The Eastern economic corridor (EEC) Industrial Robot Control Competition Camp. Students followed the one-day camp to design for understand, what is the industrial robot and automation. Collection of 7,000 from students one-day camp is to depict their perceptions toward this learning with 6 days camp by Active Learning through realize robot programming industrial process. They started with coached from faciliatory teacher, and then followed through by making programming to these designs. The experience generated an engaging and active learning environment that promoted higher level robot control skill, an effort that is needed in Thailand 4.0 today's climate of increased attention on STEM education. The faciliatory teachers for Active Learning Camp are training also. For the final activity of this project is evaluated by Robot Control Competition. During the challenge robot completion, the competency skills are observed and evaluation.

Online full paper : <https://is.gd/q1hy9E>



ETE11:NC37

The Study of Parameters Affecting the Production of Hydrogen Gas by Electrolysis Method

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The Study of parameters affecting the production of hydrogen gas by electrolysis method The objective is to design and build a trial set of a square hydrogen gas generator and to study the variables that affect the efficiency of the hydrogen gas generator. The researcher has specified the distance of stainless steel sheet into 3 stages which are 3, 4.5 and 6 mm. Moreover, the scope of the measurement is determined. To study various variables that affect the production of hydrogen gas by controlling the voltage at 12, 13, 14 Volts respectively. In this experiment, the researchers used distilled water mixed with sodium hydroxide as a solution to produce hydrogen gas. The ratio of the mixture is as follows: 2 liters of distilled water mixed with 0.5 mole sodium hydroxide. In the hydrogen gas separation equipment, the important components are as follows: 1. Stainless steel sheet with a thickness of 1 mm 2. Gasket sheet Rubber 3. Nylon sheet that acts as a membrane to prevent hydrogen gas and oxygen gas together. 4. A clear acrylic sheet with a thickness of 10 mm. From the experiment, it was found that at a voltage of 14 volts, the distance 3 mm can produce the most hydrogen gas, 1.5 liters / min which uses electricity at 7.47 amps to produce hydrogen gas. And at a voltage of 12 volts, at a distance of 6 mm, the electricity is used at 0.99 amps, which can produce the least amount of hydrogen gas, which is 0.11 liters / minute.

Online full paper : <https://is.gd/wALUC5>



ETE12:NC42

Using Ball Cleaning for Energy Saving of Chiller in Air Condition System

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Air conditioners in large buildings tend to be chiller. The most common problem is the scale. Will gather together until it becomes hard and attaches firmly to the inside surface of the condenser tube within 48-72 hours. It is also attached to the accumulation continuously, causing obstacles to the water flow rate within the pipe and the heat transfer resulting in lower efficiency in heat exchange. Resulting in increased power loss according to the thickness of the scale Due to poor heat exchange and increased internal system pressure, cooling efficiency is reduced. At present, the main method is stopping the air conditioner to clean the inside of the condenser pipe, which is impossible to clean every day. Washing 1 cold water machine takes 2-3 days. These problems can be resolved by installing a pipe cleaner inside the automatic condenser pipe or "ball cleaning system" that cleans and prevents dirt and scale deposits from adhering to the inner surface of the pipe. The condenser ball condenser can be operated at all times while the chiller is running. The pipe can be cleaned at the same time and continuously, improving the efficiency of the machine. The purpose of this research is to study the function of ventilator that affects the chiller. The researcher has spent all the research in 7 months from August 2019 to February 2020. Data collection of 6 1100 tons water cooler. By starting from washing the cold water machine Keep the chiller that does not have ball cleaning enabled, and keep the chiller that has ball activated for another 5 months. By using the Prosonic G5500 Series S/N 8M620225 Ultrasonic Flow Meter for Water Chiller. The cooling rate of the chiller is improved by 17%. Electricity used is reduced by 14%, equivalent to 648,172 baht per year, payback within 0.8 years and the efficiency of cold-water machine is improved by 7%.

Online full paper : <https://is.gd/a9Ph7D>



ETE13:NC22

Development of RESPA Learning Model for Renewable Energy Technology Education

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This research paper aims to develop the RESPA learning model for teaching and learning in renewable energy technology course. The active learning based RESPA learning model includes the Realization, Essence, Summary, Prove and Assessment processes. The research tools of the RESPA learning model were lesson plans in the topic of solar cell technology systems, teaching media, achievement test, evaluation form and questionnaires. The samples were 23 students who registered in renewable energy course at Faculty of Industrial Technology of Muban Chombueng Rajabhat University. The research results found that the five experts' opinion of appropriation in using the RESPA learning model was good quality, the efficiency of the RESPA learning model using achievement test was at the standard criteria of Meguigans's formula (1.17). The learners' satisfaction in learning and teaching by using the RESPA learning model was at high level. In conclusion, the RESPA learning model can be used in learning and teaching of science and technology course as efficiently.

Online full paper : <https://is.gd/6XOHna>



ETE14:NC28

Development of GUI MATLAB based Simulation Program for Communication Laboratory

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The objective of this research aims to develop a simulation program of communication laboratory using GUI of MATLAB software, and to evaluate the quality of the developed simulation program by using 5 experts. Research tools consist of simulation programs of 3 communication laboratories including parallel wire, twin-plane, and coaxial transmission lines, and quality evaluated form. The research results shown that the developed simulation program is suitable to design section with an average of 83.50 percent, working process section equaled to 84.5 percent and the working functional section equaled to 87.50 percent. The evaluating the quality of the developed simulation program was at high level ($\bar{x}=4.16, S.D.=0.35$). Moreover, the comparison between the results of the developed simulation program was consistent with the line theory that the developed MATLAB based simulation program can be used effectively to be as a teaching media.

Online full paper : <https://is.gd/AZR8n6>



ETE15:NC36

Development of Instructional Package on Thyristor and Applications,
Curriculum of Technician Diploma,
Savannakhet Technical-Vocational College, Lao PDR.

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This paper presents a development of instructional package on thyristor and applications, curriculum of technician diploma, Savannakhet Technical-Vocational College, Lao PDR., in apply to the MIAP based teaching of electronics industry course. The developed instructional package consists of lesson plans, content sheets of 3 units, PPT presentation programs, laboratory package, and achievement test. The sample group are 46 students enrolled in the industrial electronics course, Technician Diploma Program, Department of Electrical, 3rd year, semester 2 of academic year 2019. The research results shown that the developed instructional package has an efficiency equaled to 77.87 / 78.02 which is higher than the standard criteria of 75/75. The evaluated results of learner's satisfaction through using developed instructional package was at a high level ($\bar{x}=4.37$, S.D =0.42) according the expected research hypothesis. Conclusion, the developed laboratory based instructional package can be used as effective in learning and teaching of technology curriculum in vocational education.

Online full paper : <https://is.gd/JOKJOi>



ETE16:NC39

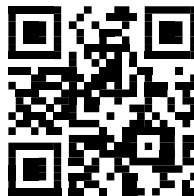
Development of Training Package on IoTs based Control Systems using MIAP Process

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In this research, a development of training package on control systems using the Internet of Things (IoT) technology through MIAP learning process was presented. The purpose of this research were to 1) Develop training packages 2) Test the effectiveness of the training packages 3) Compare the achievement before and after the training and 4) Evaluate the satisfaction of trainees the selected students to gain knowledge and the ability to apply the trained knowledge of IoT in controlling electrical devices. The developed training packages include a training plan, content sheets, activity sheets, PowerPoint presentations, an experiment board, and the pre and post tests. The sample was the 36 students in the 3rd year, who are enrolling in Electrical Technician Control Certificate Program in semester 2 of academic year 2019, in the Department of Electricity at Technical College of Vientiane Province, Laos PDR. The research results showed that the developed training package had an efficiency equal to 81.18/80.90, which was higher than the standard criteria of 80/80. The achievements after training with the training were higher than those of before training at the .05 level of significance, The evaluation result of the learners' satisfaction through the package was at a high level ($\bar{x} = 4.82$, S.D = 0.14), Therefore, the developed training package can be recommended in the learning and teaching of the microcontroller curriculum for technicians in vocational education effectively.

Online full paper : <https://is.gd/tvoeU1>



ETE17:NC41

The Construction and Efficient Validation of Instructional Package for Power Transmission Line Calculation, Higher Diploma Curriculum, SAVANNAKHET Technical-Vocational College, Laos PDR

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The objective of this research aims to construction and efficient validation of instructional package for power transmission line calculation, higher Diploma curriculum for Savannakhet Technical- Vocational College in Laos PDR, and to compare learning achievement between pre-test and post-test of learners. The constructed instructional package consists of lesson plan, information sheet, experimental set for calculation of power in transmission lines, achievement test. The sample group was 30 students in third academic year of program in power, enrolled in semester 2/2019 on transmission line and power distribution course at Savannakhet Technical-Vocational College in Laos PDR. The research results shown that the efficiency of the constructed instructional package was equal to 77.11/78.88, which was higher than the standard efficient criteria at 75/75. The progressive learning achievement of the post-test score was higher than the pre-test with statistically significant at .05. The learners' satisfaction in learning process was at high level. Thus the constructed instructional package can used appropriate in learning and teaching of vocational education to encourage students to have knowledge and practical skills consistent to expected leaning outcome of curriculum.

Online full paper : <https://is.gd/tqBTyQ>



ETE18:NC38

Training Course Development for Microsoft office Project Program by the Integrated Methodology

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The purpose of this research is to develop a training course. Construction planning with engineering software is Microsoft office Project by the integrated methodology. The purposive sampling used in this research was selected by a specific type, consisting of a first-year diploma degree of vocational students at the Department of Construction. Rayong Technical College, 30 persons. The results are summarized as follows: Context evaluation. The workplace supervisor wanted personnel to be knowledgeable about software at 100 percent, while students needed training software at 96.67 percent. the input evaluation of the course consisting of 3 online training sessions and 6 training workshops in which experts have assessed the consistency of the topic with the training with behavioral objectives. The consistency was 0.95. The behavioral objectives and the tests had a consistency of 0.85 and the training program was at the highest level ($\bar{x}=4.70, S.D.=0.51$) The process evaluation implementation of training courses that have been evaluated by experts to try out It appeared that the achievement in doing exercises. And the tests with an average score of 90.67 and 86.00 are higher than the set criteria 80/80 and the results with an average score of 97.00%, which is higher than the specified criteria 75%. The product evaluation was found that the students were satisfied with the Microsoft office Project training software course at the highest level ($\bar{x}=4.78, S.D.=0.35$)

Online full paper : <https://is.gd/XK1sAx>



ETE19:NC40

Development of Computer Drawing Training Course using Revit Program by via Flipped Classroom Model

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The research aims to develop a computer drawing training course using Revit program via the flipped classroom model. The sampling group of the research selected specifically 10 companies and the 2nd year student, in academic year 2/2562, of 22 persons who study in bachelor degree in Civil Engineering and Education program, Department of Teacher Training in Civil Engineering, Faculty of Technical Education, King Mongkut's University of Technology North Bangkok. The methodologies used in the research were the Computer Drawing Training by Revit program using the flipped classroom model, test, student satisfaction assessment in Google classroom training results show that the effectiveness of the training package was 0.86 with the confidence of students before and after training, with statistical significance at the level of .05. The result of finding the effectiveness of the training course Found that the average score of the exercise is 90 percent and the average score is 90.2 percent higher than the specified criteria 80/80 and skills is 84 percent higher than the set criteria 75 percent and students Satisfied with this software training program by using the flipped classroom model, the average level is high ($\bar{x}=4.49$)

Online full paper : <https://is.gd/wjFqRK>



Education Management and Education Administration

การจัดการและการบริหารการศึกษา

NCTechEd12 **EMA01-EMA06**

EMA01:NC27

Vocational Readiness Analysis of Graduate Students of King Mongkut's University of Technology North Bangkok

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This research aims 1) to analyze the vocational readiness of the graduate student of KMUTNB and 2) to suggest the guideline to initiative educational activity follows student's skills and capabilities according to John Holland theory. The sample group consists of master and Ph.D. students of KMUTNB with a sample size of 451 people. The tool for this research is an online John Holland's vocational readiness questionnaire and the result is interpreted by percentage, mean, and standard deviation.

The test is classified into three categories by a) sex, b) education level, and c) faculty. The highest scores are as follows. a) Male for an Artistic personality type 6 and Female for an Enterprising personality type 5. b) Ph.D. degree students for an Enterprising personality type 5 and Master degree students for an Artistic personality type 6. c) Faculty of Engineering and Faculty of Information Technology for both Artistic personality type 6; Faculty of Technical Education, Faculty of Applied Arts, College of Industrial Technology, Faculty of Business Administration for an Enterprising personality type 5; Faculty of Applied Science for a Realistic personality type 1; Faculty of Business and Industrial Development for a Social personality type 4; Faculty of Science, Energy and Environment has the highest test score for both Conventional (4) and Enterprising personality (5) types. The test results may conclude that most graduate students of KMUTNB have an Enterprising (5) and an Artistic personality (6) types. Therefore, KMUTNB should develop the work environment that fits their type in order to promote creative thinking and ethical behavior such that they can use their skills and abilities to express their values and attitudes.

Online full paper : <https://is.gd/6XaJIV>



EMA02:NC30

The Study of the Efficiency of Integrating Learning Management using Active Learning of MIAP for Inductor in Subject of Fundamental Electrical Engineering for Bachelor of Science in Technical Education

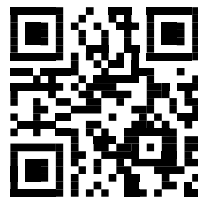
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The objectives of this research were to create, inspect effectiveness, investigate the student's achievement and to study the student's satisfaction of the integrating learning management using Active Learning of MIAP for inductor in subject of fundamental electrical engineering for bachelor of science in technical education. The sample groups were undergraduate freshman students, who in subject of fundamental electrical engineering to increase learning achievement for bachelor of science in technical education, 1st semester of academic year 2019, department of industrial engineering with total amount of 24 students with selection of purposive sampling method. The research tools used in this study were: 1) the quality evaluation forms 2) pretest and posttest 3) the survey satisfaction of learners.

The result shown that 1) the quality of the integrating learning management using Active Learning of MIAP was very high level (\bar{x} = 4.81 SD = 0.40) 2) the effectiveness of the integrating learning management using Active Learning of MIAP was 79.57 / 75.83 from assignment 75/75 3) the achievement of learners significant level was .05 4) the satisfaction of learners on teaching media was very high level (\bar{x} = 4.74 , SD = 0.48).

Online full paper : <https://is.gd/qGbh3W>



EMA03:NC11

Bakery Entrepreneurship. Case Study : Srifa Frozen Food Co; Ltd.

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The objective of this study were to study the history of operations and solutions in business administration of entrepreneurs; study the personality and characteristics of entrepreneurs; study the concepts of organizational management of the company entrepreneurs Srifah Frozen Food Company Limited. This study was a qualitative study by using the semi-structural interview. The results of the study can be summarized that the Personality and characteristics of Mr. Vichien Jentrakulroj, the managing Director of Srifah Frozen Food Company Limited, The largest producer and seller of bakery and Frozen Dough of the country under the SriFah and Suthira brands is successful entrepreneur. He has leadership, intuitiveness, and business operation ideas to achieve his goals. Therefore, he began to learn about baking pastries by enrolling at a standard baking school. There are not many bakery shops, his competitors are few, and the profits are huge. It is therefore the main reason for his decision to choose baking as a career. He sells bakery in Kanchanaburi. He is an optimistic entrepreneur and he has management skills by applying organizational management concepts, including planning, organization, recruitment, commanding and controlling.

Online full paper : <https://is.gd/3aBX7C>



EMA04.NC20

Development of Learning Activities to Enhance Technical Teacher Students Ability in Preparing Lesson Plan for Promote Active Learning

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The objectives of this research were 1) to study element and problem of lesson plan 2) to develop learning activities and 3) to implement the learning activities and evaluation. Research process conducted in three phases. Phases 1; to study element and problem of lesson plan, Phases 2; to develop five active learning activities and Phases 3; to implement the learning activities and evaluation. The data were collected with the suitability assessment form, structure interviews, ability assessment form and satisfaction assessment form by mentors, supervisor, co-instructor, technical teacher students and professor. The data were analyzed by using percentage, content analysis, mean and standard deviation. The results of the study showed that 1) the third lesson plan consists of 10 elements: (1) topics; (2) main elements; (3) Practice or Activity topics; (4) Objectives; (5) operation; (6) learning Activities; (7) teaching aids; (8) assessment of learning; (9) attachment; and (10) record after teaching consisted of 66.67% of the assessors agreed. The problematic components include topic, main element, element, activity, behavioral objectives, operation and learning activity, 2) the suitability of a learning activities in overall was at high level, 3) the ability in preparing lesson plan for promote active learning in overall was at high level 4) students' satisfaction in overall was at high level and satisfaction with the teaching and learning from lesson plan for promote active learning in overall was at very high level.

Online full paper : <https://is.gd/mUYuXm>



EMA05:NC34

The Development of Multimedia Computer Assisted Instruction (MMCAI) Using The Active Learning Model on Basic Computer Programming Subject for Industrial Teaching Mathematics of Computer Programing 1 Course, Bachelor of Science in Technical Education

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The objectives of this research were to develop, investigate the student's achievement and to study the student's satisfaction of multimedia computer assisted instruction (MMCAI) using the Active learning model in computer programming I subject for bachelor of science in technical education. The sample groups were undergraduate sophomore students, who in subject of fundamental electrical engineering to increase learning achievement for bachelor of science in technical education, 1st semester of academic year 2019, department of industrial engineering with total amount of 20 students with selection of sampling method. The research tools used in this study were: 1) the quality evaluation forms of MMCAI 2) the effectiveness of learners 3) the survey satisfaction of learners. The result indicated that 1) the Content quality of MMCAI was good level ($\bar{x} = 4.11$, $SD = 0.67$) and the technical quality was good ($\bar{x} = 4.10$, $SD = 0.50$) 2) the achievement of learners significant level was .05 4) the satisfaction of learners on teaching media was very high level ($\bar{x} = 4.67$, $SD = 0.54$).

Online full paper : <https://is.gd/OGFKmt>



EMA06:NC31

Study of Learning Management Efficiency using Demonstration Set of Basic Logic Gate Devices for Basic Digital Subject to Promote Practical Skills for Student of Industrial Education

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The objective of this research are to create, to find the effectiveness of the study, to study the achievement of learners and to study satisfaction of learners via demonstration set of basic logic gate devices for basic digital subject. Tools of this research are 1) the quality evaluation form of the demonstration set 2) 5 work sheets during study, 5 work units in each study unit 3) Pre-test 4) Post-test 5) questionnaire for learners satisfaction. The population of this research is 3rd year students of the program in electronics and telecommunications engineering that enrolled in the basic digital subject for semester 1/2019 of 24 sampling selected

The result are 1) the quality of the demonstration sets is good ($\bar{x}=4.54$, $SD=0.57$) 2) the effective of the teaching and learning process using basic demonstration sets is 95/85 percent, which is higher than the standard set of 75/75 3) learning with the demonstration sets get higher achievement with statistical significance at the level of .05 4) the learners are satisfy for the demonstration sets with good level ($\bar{x}=4.29$, $SD=0.88$)

Online full paper : <https://is.gd/K0TNJC>





ICTechEd7

7th International Conference on Technical Education



ICTechEd7

Session 1

March 25, 2020
FTE Building 52-311A

10.30 AM – 3.00 PM

1G01-1G08

1G-01:IC01

Exploring the Framework of Automotive Service Accuracy Problem Solving Skills Using Artificial Intelligence Technique

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With the rapid growth of automotive mechatronics system, automotive service accuracy problem-solving skills has become standards continuously improve on customer demands, enhancing accuracy, reliability maintenance, safety, and maintenance cost. Artificial Intelligence (AI) technique have the potentially to perform operations for enhancing the learning and decision making by special emphasis on human cognitive processes. The objective of this research was to explore the framework of automotive service accuracy problem-solving skills based on artificial intelligence technique for Electronics Concentrated Engine Control System (ECCS) fault diagnosis as perceived by experts. The research methodology was qualitative research, which was conducted by focus-group interviews. The participants were 15 among automotive service experts from Nissan Training Center, Nissan Motors (Thailand) and Nissan Surat Piya (Nakhon Si Thammarat). Data was analyzed by the experts' explorations of three basic tasks of automotive service accuracy problem-solving skills using artificial intelligence technique in ECCS fault diagnosis. The research found that these four themes covered a total of 4 themes and 12 sub-themes. Moreover, the data-driven were complementarily of automotive service technicians and AI technique in real-world situations decision-making. The famous machine learning algorithms are dealing to combine ANN and SVM methods tend to perform better for new applications. The proposed ASAPSS framework demonstrated a significant performance improvement of automotive service technicians for Nissan Motor (Thailand) and among undergraduate mechanical engineering students.

Online full paper : <https://is.gd/X8gisQ>





1G-02:IC02

The Development of Collaborative Learning Management System Using Problem-Based on Cloud Learning to Enhance Critical Thinking

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This research aims to development of collaborative learning management system using Problem-Based on Cloud learning to enhance Critical Thinking and to evaluate the developed learning management system. A sample in this research included 7 experts with experiences in course design and development of a learning management system. Research methodology comprised 5 steps according to the ADDIE Model including analysis, design, development, implementation, and evaluation. The findings of this research were: 1) the developed learning management system consisted of 3 functionalities regarding to instructors, audience, and administrators; base tools of the system included learning contents management tool, collaborative work tool, communication tool, productivity tool, presentation tool, and evaluation tool, 2) contents assessment carried out by experts regarding contents appropriateness of the learning management system revealed the highest level of system appropriation ($\bar{x}=4.63$, S.D.=0.49), and 3) techniques and methods used in learning management system evaluated by experts demonstrated the highest level of system appropriation ($\bar{x}= 4.60$, S.D. = 0.52).

Online full paper : <https://is.gd/iRYxwW>



1G-03:IC17

Learning and Teaching Management of Co-operative Education Systems for Industrial Establishments

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This research aimed to propose learning and teaching management for industrial establishments with an application of RISDA model for cooperative learning and teaching management in electric and electronic major. This research commenced from surveying on problems of learning and teaching or training of bilateral education or co-operative education in establishments, then developed RISDA Model, which comprising 5 steps as follows: 1) Recall (R); 2) Information (I); 3) Simulation (S); 4) Discussion (D); and 5) Assessment (A). Subsequently, activity plan and instruction media were created for trainings in establishments, including model, demonstration kit and computer program. The findings proved that the research tool is suitable at high level (mean = 4.13). As a result, it can be applied in learning and teaching management to encourage learners having professional competencies consistent with learning skills in the 21st century.

Online full paper : <https://is.gd/hO30Kd>



1G-04:IC18

Self-learning Package Development on The Application of the Internet of Things to Agriculture for The Study Application

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This article aims to develop and to validate a self-learning package development on the application of the internet of things to agriculture for the study application. The developed training course consists of a training set, video online, a content sheet, a presentation and a test. The developed training course is implemented and tested with the selected 25 trainees as sampling group. The research results can be stated as follows: 1)the quality evaluation assessed by 5 experts obtains the average score of 4.49 (good), 2) the training efficiency using the developed training set is efficient in accordance with Meguigans's theory. The trainee satisfaction towards developed self-learning package obtains the average score of 4.65 (very good), and can be interpreted as very satisfactory. Therefore, the self-learning package can be applied effectively in training course as well in knowledge transfer.

Online full paper : <https://is.gd/ou1hJC>



1G-05:IC06

Activation of Kaolin Geopolymerization with Sodium Hydroxide

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This article presents the activation of kaolin geopolymerization by sodium hydroxide at different concentrations under the temperature of 25 70 90 degrees Celsius for 24 hours. The strength of KA geopolymer increased as temperature increased. The strength of KA geopolymer curing under 25oc at 28 days is higher than base, subbase and subgrade material according to the Department of Highway of Thailand of 1.53, 3.83 and 9.12 times, respectively. Temperature affects both indirect tensile strength and unconfined compressive strength of samples. At the lowest temperature of 25 degrees Celsius, the polymerization reaction would proceed slowly and the strength of samples increased more rapidly as the temperature increased. The curing period of 28 days at curing temperature of 70 degree is sufficient for polymerization reaction. After 12 cyclic wetting-drying tests, the strength values still far greater than the strength values of all 3 types of road pavement. The KA geopolymer obtained is strong and durable that can be used to improve the soil quality suitable for use in pavement.

Online full paper : <https://is.gd/RLHL4V>



1G-06:IC14

Strength and Microstructures of Phosphate-Based Geopolymers from Bituminous Fly Ash

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This study investigated the characterizations of bituminous fly ash (BFA) from the power plant. BFA was used as aluminosilicate precursors for the synthesis of phosphate-based geopolymers. Four phosphoric acid solutions by the molar ratio of Al/P were an activator. Samples were prepared by adding activator to BFA to get a paste. The curing is done by both atmospheric (room) and accelerated means (60 °C). Results showed that the optimum molar ratio of Al/P was 2.1 and gave a maximum strength of 25 kg/cm² when curing at 60 °C for 24 hours. Microstructural analysis found the formation of monetite. XRD also reveals the remaining crystalline phases of quartz and mullite. SEM images confirm the presence of monetite with a lamella-like morphology.

Online full paper : <https://is.gd/01EuNF>



1G-07:IC03

Effect of the Solution Heat Treatment on Nickel Base Superalloy GTD-111 Grade After Long-Term Serviced

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This work describes a solution heat treatment for a nickel alloy GTD111 grade after long-term serviced. The solution heat treatment variables examined in this study included solution temperatures of 1050, 1100 1150 and 1200 °C, and solution time of 2-4 hr. in 1 hr. increments. The resulting materials were examined using the full factorial design of experiments to determine the resulting material hardness and observed with scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS). The results show that a longer solution time corresponds to fine γ' precipitates, which can decrease the overall hardness. The solution analysis indicates that an increase in the amount of γ' results in better hardness for particles with octagonal shapes and a small size for aging process. The factorial analysis, which was conducted on the relationship between the solution temperature and time to the hardness of the fusion zone, had a 95% confidence level.

Online full paper : <https://is.gd/nTWR5L>



1G-08:IC05

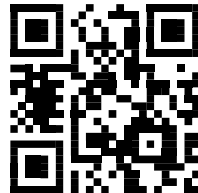
Problem Based Learning in Project Course for Actual Work in the Workplace

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The objectives of this paper were to develop the problem based learning in a project course for actual work in the workplace. Starting from analysis, design, development, implement and evaluation of problem based learning, identification of population and sample, implementation of problem based learning in project course for actual work in a workplace that was designed, with Phradabos's students who study in the project course II, and then collect data, analysis and conclusion. The result found that the efficiency of problem based learning in project course was 84.21/82.58 that were above 80/80 established criteria, the advanced abilities after learning of students who learned from problem based learning in project course increased more than before learning, a knowledge and abilities of students were improved, the amount of students passing the project course II was 68.42%, which is higher than the previous time and almost project workpieces can meet industrial requirements.

Online full paper : <https://is.gd/zM1E0F>





ICTechEd7

Session 2

March 25, 2020
FTE Building 52-311B

10.30 AM – 3.00 PM

2G01-2G09

2G-01:IC04

ROS Based Indoor AMR Design and Navigating Application

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In this paper in order to design indoor AMR with the same capability commercial AMR using today in industry, this manuscript to apply navigation package program that was proceeded and provided by ROS. The autonomous mobile robot was designed on the differential two wheeled drive and arranged with apparatuses of the robot such as IMU sensor, Motor drive and encoder sensors. Some packages of the robot were made by developers such odometry node, imu node, and robot transformation node in order to publish and subscribe ROS's messages within communicate between ROS nodes and devices of the robot. The dislocated robot was applied navigation package algorithm that it's within consist of move_base and AMCL which assist in planning and localization the robot. The experimental results that AMR able to transition of five positions that average errors of position are about ($x=0.044$, $y=0.058$) and of theta is about 4.8 degree angle.

Online full paper : <https://is.gd/NvhUDf>



2G-02:IC07

Promotion of High-Order Analytical Thinking Skills using NCOM Simulator through STEAM Education

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This research paper describes the promotion of high-order analytical thinking skills using NCOM simulator through STEAM education for learning and teaching of telecommunication engineering course. The STEAM based teaching process of communication network subject includes presentation, simulation, discussion, conclusion and assessment steps. In simulation process, the high-order analytical thinking skills of learners were encouraged using the developed diverse co-teaching activities. The developed MATLAB based NCOM simulator to be as a teaching aid in communication network analysis education consists of three parts: resonant circuit, two port network and filter analysis. The quality of the NCOM simulator and developed STEAM based teaching activities evaluated by five experts was more appropriate level. After implementing the NCOM simulator in classroom at Department of teacher training in electrical engineering, Faculty of technical education, King Mongkut's University of Technology North Bangkok, the efficiency of learning and teaching process was in accordance to the standard criteria of Meguigans's formula. In conclusion, the STEAM based teaching process can be used to encourage learners to have the high-order analytical thinking skills that are consistent to expected learning outcome of telecommu-nication engineering curriculum.

Online full paper : <https://is.gd/aBhSUP>



2G-03:IC08

Promotion of Advanced Practical Skills Using Disciplinary Integration Teaching and Learning Activity for Electrical Engineering Education

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The purpose of this paper is on the promotion of advanced practical skills using disciplinary integration teaching and learning activity for electrical engineering education. The study initially developed teaching and learning by focusing on learner-center in class learning and learners' involvement in the activities according to STEM Education. The instrument used in this research included teacher's handbook, teaching media such as demonstration and training packages, computer media, and evaluation form. After the developed teaching model was trialed in the course of electrical technology with the samples of students in Faculty of Industrial Technology at Chitralada Technology Institute. It was found that the developed teaching and learning model based on STEM education could promote students' involvement on determining teaching and learning activities, and their ability to select learning methods suitable for their existing knowledge and aptitude. In addition, the practice-based activities could enhance students working skill, work experience, and teamwork. Moreover, students were satisfied with the teaching and learning activities which could promote working skills to support technology education effectively and produce graduates with capabilities according to the real needs of industrial manufactures.

Online full paper : <https://is.gd/T4UVMV>



2G-04:IC11

Developing Knowledge and Skills in Science and Technology on Basic Robotics using Activity-based Learning

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The research purpose aims to develop knowledge and skills in science and technology on basics robotics using activity-based learning. The research tool consists of training plan, work sheets, PPT presentation program, instructional media and achievement test. Sample group was 46 students of secondary education at Satri-Nonthaburi School or interesting peoples, in Thailand. The training time period was 24 hours for 4 days. The research results shown that developed training package was high quality (mean=4.16), the trainees' satisfaction was at a high level (mean=4.31) and the efficiency of the training package was the agreement to the standard criteria of Meguigan's formula (1.01). Therefore, the developed training package can be used to encourage learners to have appropriately competencies in science and technology.

Online full paper : <https://is.gd/1BGkj0>



2G-05:IC13

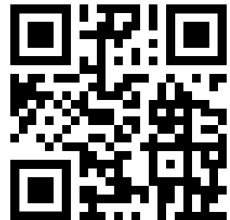
Experimental-Set of Antenna and Microwave Laboratory for Undergrad Student

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This paper presents an experimental-set of antenna and microwave circuit design laboratory for undergrad student. The proposed experimental-set provides insight into the antenna design, microwave filter circuit design and microwave matching circuit design. The fabrication and measurement skills and knowledge of student will be improved by using the proposed experimental-set. The proposed experimental-set consists of 1) microstrip patch antenna design and measurement, 2) filter circuit design, 3) matching circuit design and 4) standing wave. The proposed experimental-set is constructed by using a low cost component such as FR-4 printed circuit board (PCB), lumped and distributed elements. The details of equipments and the experimental procedure will be illustrated. The preliminary evaluation results of the student testing group show that the fabrication and measurement skills of student are significantly improved.

Online full paper : <https://is.gd/X9Iy7I>



2G-06:IC09

Promoting Affective Competency Based on Industrial Psychology for Engineering Teachers

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Objectives of this research aim to survey needs of the affective competency necessary for engineering teachers, to develop co-teaching activities to enhance the affective competency of engineering teachers through industrial psychology concept, to implement with sample group, and to evaluate the affective competency level of the in-service teachers. The research process consists of survey of affective competency needed for engineering teachers, then developing teaching and learning activities for engineering teacher training using industrial psychology concept. The developed co-teaching activities were implemented to simple group that was an undergraduate students enrolled in the 2nd semester of the academic year 2019, Bachelor of Technical Education in Electrical Engineering, King Mongkut's University of Technology North Bangkok. The research results showed that the engineering teachers should have important affective competencies consisting of 5 sectors as 1) Emotion, 2) Personality, 3) Human Relations, 4) Personnel Leadership, and 5) Teamwork. The appropriation of affective competency evaluated by 28 learners was at a high level. The management of teaching and learning activities in the teaching practice course using the industrial psychology concept can promote the engineering teachers to have affective competency as well. The satisfaction of the learners in learning and teaching management of engineering teachers was at a high level. In conclusion, the important affective competencies of engineering teachers consist of emotional behaviors, good personality, relationship, leadership, and able to work as a team which is a feature necessary to be professional engineering teachers.

Online full paper : <https://is.gd/s8l6dS>



2G-07:IC16

Development of Learning Innovation of DTV Antennas for Telecommunication Education

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This research presented the development of learning innovation of digital TV antennas for applying in telecommunication education. The DTV antennas consisting 3E Yagi-Uda and 6E Log-periodic antennas were designed using the dipole array antenna theory and constructed in operating frequency range of 470-860 MHz. The efficient DTV antennas using digital TV broadcasting in Thailand were measured and tested using professional spectrum and power analyzer. The research results shown that the frequency responds of developed DTV antennas can operate efficiently the 5 MUX (between 514 to 722 MHz) of digital TV frequency band. The received power between receiver and transmitter at 100 KW of transmitted power and 10 km of distance was proximally equaled to 53-60 dBuV. The constructed DTV antennas can be used to be as a technological learning innovation in telecommunication engineering education.

Online full paper : <https://is.gd/KSXu6y>



2G-08:IC10

Effect of STEM Education Approach on Programming Skills in Basic Microcontroller Learning

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This research, the authors aimed to 1) compared the learning achievement of students between the pre-learning basic microcontroller and post-learning basic microcontroller when the authors applied STEM education into the Basic Microcontroller class 2) study effect of STEM education in learning basic microcontroller on students' opinion. The sampling of the research was 17 undergraduate students of Teacher Training in Electrical Engineering Department, King Mongkut's University of Technology North Bangkok. The authors employed STEM learning management, STEM learning activities, basic microcontroller Lab-test, basic microcontroller learning achievement evaluation, and students' opinion evaluation based on STEM education. The learning achievement of students after studied basic microcontroller based on the STEM system was better than the pre-learning basic microcontroller and obtained statistically significant at the 0.01 level for better learning achievement. Additionally, the students were satisfied with the STEM education on programming skills in basic microcontroller learning by giving 4.33/5.00 for average scores and 0.67 S.D. The results of the evaluations crystallly-clear confirmed that STEM education provided a promising learning system for students to have better learning and achievement in the basic microcontroller.

Online full paper : <https://is.gd/3m4PBk>



2G-09:IC12

Engineering Education Management using Project-Based and MIAP Learning Model for Microcontroller Applications

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The purpose of this research was to 1) develop teaching and learning in pre-engineering curriculum by using project-based learning process based on the MIAP learning model, 2) test the efficiency of the teaching and learning process for microcontroller applications of electrical engineering course. Research tools used in the research were lesson plans based on the project-based with the MIAP learning process, knowledge sheet, electronic slides, and learning achievement test. Moreover, the efficiency of teaching and learning process and students' satisfaction assessment were evaluated using a sample of secondary school' students in the academic year 1/2019 of electrical engineering preparation course of Satri-Nonthaburi School. The research results found that 1) the performance of the project-based learning process through the MIAP learning model, has an average efficiency of 86.84/70.78 percentage and 2) the learners' satisfaction with the developed learning and teaching process was at a high level (the average is 4.31). Therefore, the developed learning and teaching process can be applied to manage efficiently the teaching and learning in electrical engineering and the students can apply the knowledge to working in real life.

Online full paper : <https://is.gd/5hx4UF>



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The 7th International Conference on Technical Education

*“The Challenge of Disruptive Innovation
in Engineering and Technical Education”*

March 25, 2020

at Faculty of Technical Education

King Mongkut’s University of Technology North Bangkok

About ICTechEd 2020:

According to the changing of the global economy, Thailand’s economic highly depends on manufacture and service industries whereas the expansion in agricultural sector decreases in numerous areas and agriculturists. The movement of some agriculturists to the industrial and service sectors causes the problem of higher low-quality labors. The vocational education reform is a way to solve the problem as stated by emphasizing on production and developing teachers and students to be quality. For this reason, the instructional model and curriculum development should be designed considering the academic and vocation increasingly.

The Faculty of Technical Education (FTE), King Mongkut’s University of Technology North Bangkok (KMUTNB) has continuously concentrated on producing and developing qualified technical teachers in Bachelor’s, Master’s and Doctoral levels while conducting and publicizing research in both technical education and engineering over 51 years. That is a consequence of the academic cooperation between the Thai Government and the Federal German Government especially in the knowledge transfer regarding the “Engineering Teacher”. Until now, the FTE has always encouraged instructors, students, and researchers to conduct the research in vocational development in order to upgrade the career development and the sustainably learning developments. Moreover, knowledge networking on technical education, especially with the Office of Vocational Education Commission (VEC), is aimed at increasing the number of academic staffs with graduate level that will be emphasized on the potential of knowledge transfer corresponding to the industrial demand. That is the concept of creating the master of learning models, which reflects on the research potential continuously.



The 12th National Conference on Technical Education and the 7th International Conference on Technical Education will be organized under the theme of “The Challenge of Disruptive Innovation in Engineering and Technical Education”. The objective of The 7th ICTechEd is to provide an international forum for researchers, academicians as well as engineers to toward the Sufficiency Economy Philosophy for to initiate, distribute, and exchange knowledge, new ideas, and application experiences about engineering and technical education that will contribute to the academic sustainable development.

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(The 12th National Conference on Technical Education
and The 7th International Conference on Technical Education)

วันที่ 25 มีนาคม พ.ศ. 2563

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7. อาจารย์ ดร.อโนมา	ศิริพานิช	กรรมการ
8. อาจารย์ ดร.สวนันท์	แดงประเสริฐ	กรรมการ
9. นางสาววรัทยา	ประจักษ์เพิ่มศักดิ์	กรรมการ
10. นางสาววลัยพร	ยอดคำมี	กรรมการและเลขานุการ

คณะกรรมการจัดทำเอกสารและประชาสัมพันธ์

1. ผู้ช่วยศาสตราจารย์ ดร.จรัญ	แสนราช	ประธานกรรมการ
2. อาจารย์ ดร.สมคิด	แซ่หลี่	รองประธานกรรมการ
3. อาจารย์ ดร.ธีรพงษ์	วิเรียนนท์	รองประธานกรรมการ
4. ผู้ช่วยศาสตราจารย์ ดร.สยาม	แกมขุนทด	กรรมการ
5. ผู้ช่วยศาสตราจารย์ ดร.วัฒนา	แก้วมณี	กรรมการ
6. ผู้ช่วยศาสตราจารย์ ดร.ดวงกมล	โพธิ์นาค	กรรมการ
7. อาจารย์ ดร.อโนมา	ศิริพานิช	กรรมการ
8. อาจารย์ ดร.สวนันท์	แดงประเสริฐ	กรรมการ
9. นายประจักษ์เวช	ดีวี	กรรมการ
10. นายเชมวันต์	จันทร์รังษี	กรรมการ
11. นายวีระเชษฐ์	มะแซ	กรรมการ
12. นางสาววลัยพร	ยอดคำมี	กรรมการ

- | | | |
|------------------|--------|----------------------------|
| 13. นางสาวศิริพร | ยางสวย | กรรมการและเลขานุการ |
| 14. นางสาวกณิตา | กลานาม | กรรมการและผู้ช่วยเลขานุการ |

คณะกรรมการเลขานุการ

- | | | |
|-------------------------------|---------------------|----------------------------|
| 1. รองศาสตราจารย์ ดร.สมศักดิ์ | อรรถทิมากุล | ประธานกรรมการ |
| 2. นางสาวเมตตา | กลิ่นมาลี | รองประธานกรรมการ |
| 3. นางสาววรัทยา | ประจักษ์เพิ่มศักดิ์ | กรรมการ |
| 4. นางชวนชม | สิบพันทา | กรรมการ |
| 5. นางสาวตรุณี | ไชยรักษ์ | กรรมการ |
| 6. นางสาวธัชพรพรณ | กลิ่นเมธี | กรรมการ |
| 7. นางสาวพัชรี | เอี่ยมสุข | กรรมการ |
| 8. นางสาวกณิตา | อยู่เจริญ | กรรมการ |
| 9. นางสมพิศ | เกษมราษฎร์ | กรรมการ |
| 10. นางสาวปาริชาติ | คชลุน | กรรมการ |
| 11. นางสาวขวัญใจ | ผุดผาด | กรรมการ |
| 12. นายวิศณุ | ศรไชย | กรรมการ |
| 13. นายกฤตินันท์ | เพชรศรี | กรรมการ |
| 14. นายสุกฤต | อุจะรัตน์ | กรรมการ |
| 15. นางสาวรัตนภรณ์ | ใจเจริญ | กรรมการ |
| 16. นางรัชฎาพร | เริงประเสริฐวิทย์ | กรรมการ |
| 17. นางปะนาลี | ปัญญาชีวิตา | กรรมการ |
| 18. ว่าที่ ร.ต.หญิงสุภารัตน์ | วิริยโรจนกุล | กรรมการ |
| 19. นางศิริรักษ์ | สุขสุด | กรรมการ |
| 20. นางสาวเนตรนภา | สุขมงคล | กรรมการ |
| 21. นางเอื้องพร | อมรศิริธู | กรรมการ |
| 22. นางชฎานิชษฐ์ | หาญรินทร์ | กรรมการ |
| 23. นางสาวพรฤดี | สุละพาน | กรรมการ |
| 24. นางสาวศุภดา | ปรังประโคน | กรรมการ |
| 25. นางสาวอัญมณี | ภูชิน | กรรมการ |
| 26. นางสาวพิรยาภรณ์ | สุละพาน | กรรมการ |
| 27. นางกนกภัทร | คูพิพัฒน์ไพศาล | กรรมการและเลขานุการ |
| 28. นางสาวสุภาพร | แข่งไพเราะ | กรรมการและผู้ช่วยเลขานุการ |
| 29. นางสาวศิริพร | ยางสวย | กรรมการและผู้ช่วยเลขานุการ |

คณะกรรมการพิจารณา

- | | | |
|----------------------------------|-------------|----------------------------|
| 1. อาจารย์ ดร.ธีรพงษ์ | วิริยานนท์ | ประธานกรรมการ |
| 2. ผู้ช่วยศาสตราจารย์ ดร.สุชัยญา | โปษะนันท์ | รองประธานกรรมการ |
| 3. ผู้ช่วยศาสตราจารย์ ดร.ณัฐพร | อุตกฤษฎ์ | กรรมการ |
| 4. นางสาวสุจิตตรา | มีชนะ | กรรมการ |
| 5. นางสาวอนุมาศ | บุญลอย | กรรมการ |
| 6. นายประจักษ์เวช | ตีวี | กรรมการ |
| 7. นางสาวศิริพร | ยางสวย | กรรมการ |
| 8. นางสาววลัยพร | ยอดคำมี | กรรมการและเลขานุการ |
| 9. นางสาวรติภัทร | ไกรศรีวรรณะ | กรรมการและผู้ช่วยเลขานุการ |

รายชื่อคณะกรรมการบรรณาธิการ

1. ศาสตราจารย์ ดร.พานิช วุฒิพุกษ์ ประธานกรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
2. รองศาสตราจารย์ ดร.ชัยวิชิต เขียรชนะ รองประธานกรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
3. ผู้ช่วยศาสตราจารย์ ดร.จรัญ แสนราช รองประธานกรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
4. ศาสตราจารย์ ดร.ประยูทธ อัครเอกผาลิน กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
5. ศาสตราจารย์ ดร.दनัย ต.รุ่งเรือง กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
6. รองศาสตราจารย์ ดร.บัณฑิต สุขสวัสดิ์ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
7. รองศาสตราจารย์ ดร.พยุ่ง มีสีจ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
8. รองศาสตราจารย์ ดร.อนันต์ สืบสำราญ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
9. รองศาสตราจารย์ ดร.สมศักดิ์ อรรถทิมากุล กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
10. ผู้ช่วยศาสตราจารย์ ดร.สุชัยญา โปษะนันท์ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
11. ผู้ช่วยศาสตราจารย์ ดร.วัฒนา แก้วมณี กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
12. ผู้ช่วยศาสตราจารย์ ดร.ประสิทธิ์ ประมงอุดมรัตน์ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
13. ผู้ช่วยศาสตราจารย์ ดร.ศักดา กตเวทวารักษ์ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
14. ผู้ช่วยศาสตราจารย์ ดร.จิรพันธุ์ ศรีสมพันธุ์ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
15. ผู้ช่วยศาสตราจารย์ ดร.อโณทัย สุขแสงพนมรุ้ง กรรมการ
โรงเรียนนายร้อยพระจุลจอมเกล้า

16. อาจารย์ ดร.อโนมา ศิริพานิช กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
17. อาจารย์ ดร.สวนันท์ แดงประเสริฐ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
18. พลเรือโท ศาสตราจารย์ ดร.มนต์ชัย กาทอง กรรมการ
ข้าราชการบำนาญ
19. ศาสตราจารย์ ดร.สุขสันต์ หอพิบูลสุข กรรมการ
ภาควิชาวิศวกรรมโยธา มหาวิทยาลัยเทคโนโลยีสุรนารี
20. ศาสตราจารย์ ดร.สุเชษฐ์ ลิขิตเลอสรวง กรรมการ
คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
21. รองศาสตราจารย์ ดร.ปรียาพร วงศ์อนุตรโรจน์ กรรมการ
ข้าราชการบำนาญ
22. รองศาสตราจารย์ ดร.รัตติกร วรากุลศิริพันธุ์ กรรมการ
คณะเทคโนโลยีสารสนเทศ สถาบันเทคโนโลยีไทย - ญี่ปุ่น
23. รองศาสตราจารย์ ดร.ปรียาภรณ์ ตั้งคุณานันต์ กรรมการ
คณะครุศาสตร์อุตสาหกรรม สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง
24. รองศาสตราจารย์ ดร.อัศรินทร์ พูลกระจ่าง กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี
25. รองศาสตราจารย์ ดร.สุทธิศักดิ์ ศรีลัมพ์ กรรมการ
คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเกษตรศาสตร์ บางเขน
26. ผู้ช่วยศาสตราจารย์ ดร.รุ่งอรุณ พรเจริญ กรรมการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีราชมงคลพระนคร
27. นางสาวลลิตพร ยอดคำมี เลขานุการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
28. นางสาวศิริพร ยางสวย ผู้ช่วยเลขานุการ
คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ

รายนามผู้ทรงคุณวุฒิพิจารณาบทความ (ภายใน)

1	ดร.ธนพล ลักนาววัฒน์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
2	รองศาสตราจารย์ ดร.วิบูลย์ ชื่นแขก	ข้าราชการบำนาญ
3	รองศาสตราจารย์ ดร.บัณฑิต สุขสวัสดิ์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
4	รองศาสตราจารย์ ดร.พงศธร ชมทอง	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
5	รองศาสตราจารย์ ดร.กฤษมันต์ วัฒนานรงค์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
6	ผู้ช่วยศาสตราจารย์ ดร.กฤษ สิ้นธนะกุล	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
7	ผู้ช่วยศาสตราจารย์ ดร.ธัญญรัตน์ น้อมพลกรัง	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
8	ผู้ช่วยศาสตราจารย์ ดร.สยาม แกมขุนทด	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
9	ดร.นุชนาฏ ชุ่มชื่น	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
10	ดร.กัญญวิทย์ กลิ่นบำรุง	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
11	ผู้ช่วยศาสตราจารย์ ดร.วรรณชัย วรรณสวัสดิ์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
12	รองศาสตราจารย์ ดร.สมศักดิ์ อรรถทิมากุล	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
13	ผู้ช่วยศาสตราจารย์ ดร.ศิริศักดิ์ คงสมศักดิ์สกุล	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
14	รองศาสตราจารย์ ดร.วัชรินทร์ โพธิ์เงิน	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
15	ดร.ต้องชนะ ทองทิพย์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
16	รองศาสตราจารย์ ดร.เมธีพจน์ พัฒนศักดิ์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
17	ดร.ธาริณี ทองเกิด	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
18	ดร.ปิยะ กรกชจินตนาการ	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
19	ผู้ช่วยศาสตราจารย์ ดร.กิตติศักดิ์ แพบัว	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
20	รองศาสตราจารย์ ดร.ฐิติพงษ์ เลิศวิริยะประภา	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
21	ผู้ช่วยศาสตราจารย์ ดร.เอกกมล บุญยะผลานันท์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
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23	ผู้ช่วยศาสตราจารย์ ดร.ชูชาติ สีเทา	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
24	ผู้ช่วยศาสตราจารย์ ดร.จรัญ แสนราช	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ

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- | | | |
|----|--|---|
| 1 | ผู้ช่วยศาสตราจารย์ ดร.ปรีชา การินทร์ | สถาบันเทคโนโลยีพระจอมเกล้า
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27	ดร.อนุรักษ์ เมฆพะโยม	มหาวิทยาลัยเทคโนโลยีราชมงคลสุวรรณภูมิ
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30	ผศ.สุประวิทย์ เมืองเจริญ	มหาวิทยาลัยเทคโนโลยีราชมงคลสุวรรณภูมิ ศูนย์สุพรรณบุรี
31	ดร.ธงชัย แก้วกิริยา	สถาบันเทคโนโลยีไทย-ญี่ปุ่น
32	ดร.นพศักดิ์ ต้นดีสัตยานนท์	มหาวิทยาลัยเทคโนโลยีราชมงคลรัตนโกสินทร์ วิทยาเขตวังไกลกังวล
33	ผู้ช่วยศาสตราจารย์ ดร.พงศ์ธัช แซ่จู้	มหาวิทยาลัยขอนแก่น
34	รองศาสตราจารย์ ดร.นนทลี พรธาดาวิทย์	มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี
35	ผู้ช่วยศาสตราจารย์ ดร.สุภาณี เส็งศรี	มหาวิทยาลัยนครสวรรค์

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3.	ผู้ช่วยศาสตราจารย์ ดร.จรัญ	แสนราช	รองประธานกรรมการ
4.	ผู้ช่วยศาสตราจารย์ ดร.สรเดช	ครุฑจ้อน	รองประธานกรรมการ
5.	รองศาสตราจารย์ ดร.อนันต์	สีปสำราญ	กรรมการ
6.	รองศาสตราจารย์ ดร.สมศักดิ์	อรรคทิมากุล	กรรมการ
7.	ผู้ช่วยศาสตราจารย์ ดร.จิรพันธุ์	ศรีสมพันธุ์	กรรมการ
8.	ผู้ช่วยศาสตราจารย์ ดร.กิตติวุฒิ	ศุทธิวิโรจน์	กรรมการ
9.	ผู้ช่วยศาสตราจารย์ ดร.ชัยพล	ธงชัยสุรัชต์กุล	กรรมการ
10.	ผู้ช่วยศาสตราจารย์ ดร.ภฤช	สินธนะกุล	กรรมการ
11.	ผู้ช่วยศาสตราจารย์ ดร.ดวงกมล	โพธิ์นาค	กรรมการ
12.	ผู้ช่วยศาสตราจารย์ ดร.สยาม	แกมขุนทด	กรรมการ
13.	ผู้ช่วยศาสตราจารย์ณิขมน	พูนน้อย	กรรมการ
14.	อาจารย์ ดร.ปิยะ	กรกชจินตนาการ	กรรมการ
15.	อาจารย์ ดร.ต้องชนะ	ทองทิพย์	กรรมการ
16.	อาจารย์ ดร.อโนมา	ศิริพานิช	กรรมการ
17.	นางสาววลัยพร	ยอดคำมี	กรรมการและเลขานุการ

คณะกรรมการจรรยาและสถานที่จัดรถ

- | | | |
|-------------------------------|-------------|---------------------|
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| 6. นายสุกฤต | อุจะรัตน์ | กรรมการและเลขานุการ |

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คณะวิศวกรรมศาสตร์
มหาวิทยาลัยเทคโนโลยีราชมงคลล้านนา



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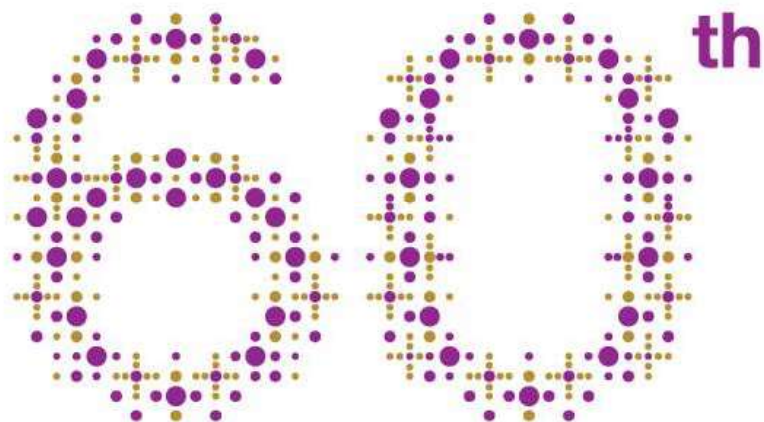
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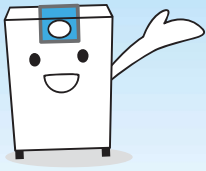
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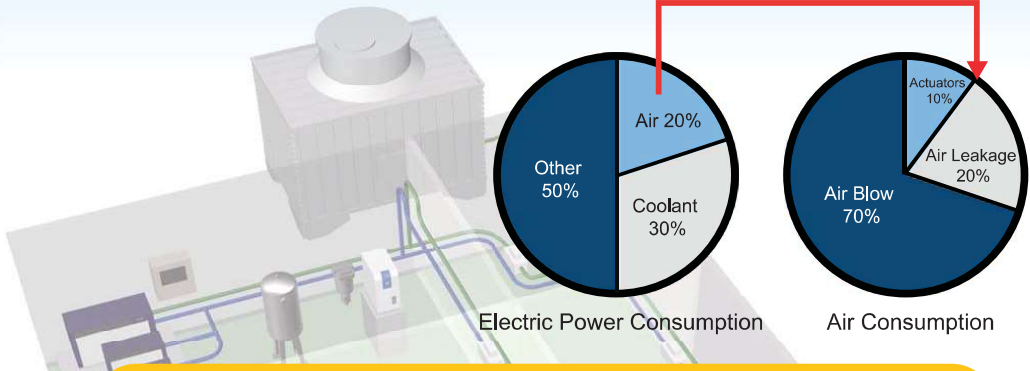
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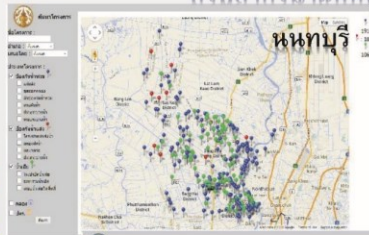
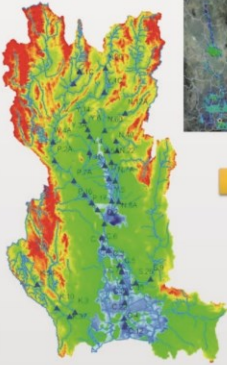
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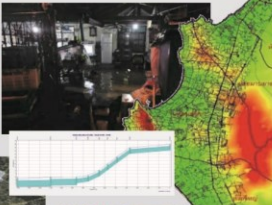
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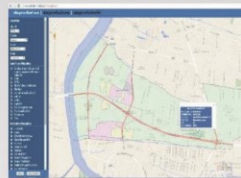


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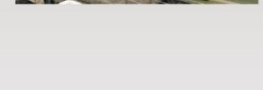
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มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ

สมาคมศิษย์เก่าครุศาสตร์อุตสาหกรรม มจพ. จัดตั้งขึ้นเมื่อวันที่ 7 เมษายน 2536

โดยมีวัตถุประสงค์เพื่อ

1. ประสานสามัคคี เกื้อกูลสนับสนุนให้หมู่สมาชิกเกี่ยวกับการประกอบอาชีพที่พึงปฏิบัติต่อสังคมที่ไม่ขัดต่อศีลธรรมและกฎหมายของบ้านเมือง
2. เสริมสร้างสัมพันธ์ที่ดีระหว่างศิษย์เก่า และศิษย์ปัจจุบันของคณะครุศาสตร์อุตสาหกรรม
3. เป็นศูนย์รวมการศึกษา ค้นคว้า และเป็นທີ່ปรึกษาทางด้านวิชาการแก่สมาชิกและบุคคล
4. เป็นศูนย์กลางเพื่อจัดหารายได้ สำหรับบำรุงคณะครุศาสตร์อุตสาหกรรม

ทั้งนี้ ไม่ดำเนินการใดๆ ที่เกี่ยวกับการเมือง การพนัน การหาผลกำไรมาแบ่งปันตลอดจนไม่ทำให้เสื่อมเสีย ศีลธรรม จารีตประเพณี และวัฒนธรรมอันดีงามของชาติ

ที่ตั้งของสมาคมฯ ณ คณะครุศาสตร์อุตสาหกรรม มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
เลขที่ 1518 ถนนประชาราษฎร์ 1 แขวงวงศ์สว่าง เขตบางซื่อ กรุงเทพมหานคร 10800

รายชื่อนายกสมาคมฯ

1. คุณชินติพล	วัชรานาถ	ปีวาระ 2536-2538
2. คุณพงศ์อินทร์	บุรารัตนวงศ์	ปีวาระ 2538-2540
3. คุณสันต์	ตันต์ทวีสุทธิ์	ปีวาระ 2540-2542
4. คุณวิชัย	สืบศิริพงศ์	ปีวาระ 2542-2544
5. คุณแสงชัย	โชติช่วงชัชวาล	ปีวาระ 2544-2546
6. คุณสุพจน์	จันทร์วิวัฒน์	ปีวาระ 2546-2548
7. คุณวินัย	สารสุวรรณ	ปีวาระ 2548-2550
8. คุณสุทธิ	ห่อเพชรรุ่งเรือง	ปีวาระ 2550-2552
9. คุณอุดม	สุขสุดประเสริฐ	ปีวาระ 2552-2554
10. ผศ.ดร.ชัยพล	ธงชัยสุรชัตกุล	ปีวาระ 2554-2556
11. นายสมพร	โพธิ์อยู่	ปีวาระ 2556-2558
12. นายยุทธอง	อรัญยกานนท์	ปีวาระ 2558-2562
13. คุณกิตติ	เจริญวิติกุล	ปีวาระ 2562-ปัจจุบัน

Philosophy Commitments Vision Mission Uniqueness Identity

Philosophy : To encourage innovation in Science and Technology through the development of people

Commitments : Produce high quality graduates with good academic record excellence in the fields of Science, Engineering and Technology for Teaching who can demonstrate, manage, utilize, innovate and develop efficient technology. Altogether, focus on up-grading the study of science, engineering and advanced technology to serve the need of the economy

Vision : The learning organization and mastership of engineering teacher, through a balance of morality with international invention, creativity research, and technology

Mission : To produce and develop qualified technical teachers in Bachelor's, Master's and Doctoral levels,
To conduct and publicize research in both technical education and engineering,
To provide academic services i.e. consultancy, testing, survey and training, and Activities related to the country's art and culture should be the preservation of tradition.

Uniqueness : A Mastership of Engineering Teacher and Creative Innovation

Identity : Graduates with Creativity, Workability and Knowledge Transferable

Departments & Programs

Department of Teacher Training in Mechanical Engineering (tm.kmutnb.ac.th)

- Bachelor of Science in Technical Education (B.S.Tech.Ed.) Program in Mechanical Engineering
- Bachelor of Science in Technical Education (B.S.Tech.Ed.) Program in Production and Industrial Engineering
- Bachelor of Science in Technical Education (B.S.Tech.Ed.) Program in Mechatronics Engineering
- Master of Science in Technical Education (M.S.Tech.Ed.) Program in Mechanical Engineering Education
- Doctor of Philosophy (Ph.D.) Program in Mechanical Engineering Education

Department of Teacher Training in Electrical Engineering (te.kmutnb.ac.th)

- Bachelor of Science in Technical Education (B.S.Tech.Ed.) Program in Electrical Engineering
- Bachelor of Engineering (B.Eng.) Program in Electrical Engineering and Education (5-Year Program)
- Master of Science in Technical Education (M.S.Tech.Ed.) Program in Electrical Engineering Education
- Doctor of Philosophy (Ph.D.) Program in Electrical Engineering Education
- Doctor of Philosophy (Ph.D.) Program in Electrical & Energy Engineering (English Program)

Department of Teacher Training in Civil Engineering (tfc.fte.kmutnb.ac.th)

- Bachelor of Engineering (B.Eng.) Program in Civil Engineering and Education (5-Year Program)
- Master of Engineering (M.Eng.) Program in Civil Engineering and Education
- Doctor of Philosophy (Ph.D.) Program in Civil Engineering and Education

Department of Computer Education (ced.kmutnb.ac.th)

- Bachelor of Science in Technical Education (B.S.Tech.Ed.) Program in Computer Technology (5-Year Program)
- Master of Science in Technical Education (M.S.Tech.Ed.) Program in Computer Education
- Doctor of Philosophy (Ph.D.) Program in Computer Education

Department of Education Technology and Information Science (met.fte.kmutnb.ac.th)

- Master of Science in Technical Education (M.S.Tech.Ed.) Program in Technical Education Technology
- Master of Science (M.S.) Program in Information and Communication Technology for Education
- Doctor of Philosophy (Ph.D.) Program in Technical Education Technology
- Doctor of Philosophy (Ph.D.) Program in Information and Communication Technology for Education

Department of Technical Education Management (tem.fte.kmutnb.ac.th)

- Master of Science in Technical Education (M.S.Tech.Ed.) Program in Vocational and Technical Education Management
- Doctor of Philosophy (Ph.D.) Program in Vocational and Technical Education Management