Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47920	25	17659	Lecture	Carla Zoltowski	Wed	5:30 - 6:20 pm	EE 129
ENGR 17920	25	17654					
ENGR 27920	25	17657					
ENGR 37920	25	17656					
ENGR 47921	34	22764					
ENGR 47922	25	17658					
ENGR 47920	1	17340	Engineering Education: Contribute to NSF-funded Engineering Education research projects. Explore relevant literature and learn data analysis techniques (primarily qualitative, but also quantitative).	Carla B. Zoltowski	Wed	3:30 PM	EE 011
ENGR 17920	1	17337					
ENGR 27920	1	17338					
ENGR 37920	1	17336					
ENGR 47921	1	22707					
ENGR 47922	1	17339					
ENGR 47920	2	17359	Image Processing and Analysis: This team uses machine learning strategies for image recognition and video processing research applications.	Edward J Delp, Carla B Zoltowski	Tues	6:00 - 6:50 pm	EE 013
ENGR 17920	2	17341					
ENGR 27920	2	17345					
ENGR 37920	2	17344					
ENGR 47921	32	22708					
ENGR 47922	2	17358					
ENGR 17912	LC0	18570					
ENGR 47920	3	17366	Alternative Energy Grid Integration and Systems (AEGIS) team: This team uses advanced methods to analyze and design modern electric power components and systems, such as electric vehicles and smart grids.	Dionysios Aliprantis	TBD	TBD	Wang 2055
ENGR 17920	3	17361					
ENGR 27920	3	17363					
ENGR 37920	3	17362					
ENGR 47921	3	22709					
ENGR 47922	3	17364					
ENGR 47920	4	17374	Data Analytics for Smart Cities project aims to conduct interdisciplinary research to develop data analytics tools using robotics and autonomous sensing for condition assessment of urban systems.	Mohammad Jahanshahi	Wed	11:00 am - 11:50 am	HAMP 4144
ENGR 17920	4	17367					
ENGR 27920	4	17370					
ENGR 37920	4	17369					
ENGR 47921	4	22710					
ENGR 47922	4	17373					
ENGR 47920	5	17388	CAM2: Crowdsourcing. Manage images and the metadata for computer vision research. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu; Ming Yin	Wed	2:30 - 3:20 pm	EE 011
ENGR 17920	5	17375					
ENGR 27920	5	17380					
ENGR 37920	5	17377					
ENGR 47921	5	22711					
ENGR 47922	5	17386					
ENGR 47920	6	17452	AI-based Automation in the Classroom (AAC). SENIOR DESIGN ONLY- Develop AI-based tools to automate and enhance classroom experiences (e.g., Automatic attendance tracking via facial recognition, context-aware chatbots as 'virtual teaching assistants'.) Programming skills required; knowledge of python preferred. Students must complete two consecutive semesters of this project to use toward senior design	Mithuna S Thottethodi	Tues	1:30 - 2:20 pm	EE 013
ENGR 17920	6	17395					
ENGR 27920	6	17426					
ENGR 37920	6	17425					
ENGR 47921	6	22712					
ENGR 47922	6	17439					

Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47920	7	17494	Earth History Visualization: This team has been very successful during the past years in making our planet's history easily accessible to both public and scientific audiences. Our current goals are (1) user-friendly web-applications for Earth-history visualization, (2) applying data-mining and machine-learning techniques to the vast databases to unravel our planet's secrets, and (3) be an active part of the new "Deep-Time Digital Earth" big-data science program of the Internat. Union Geol. Sciences/UNESCO.	James Ogg, Aaron Ault	Friday	11:30-12:20	EE 013
ENGR 17920	7	17458					
ENGR 27920	7	17473					
ENGR 37920	7	17460					
ENGR 47921	7	22713					
ENGR 47922	7	17474					
ENGR 17912	LC7	18552					
ENGR 47920	8	17510	Earth Remote Sensing with Signals of Opportunity: Design instrumentation and conduct field experiments to collect VVHF/P-band and S-band satellite signals and evaluate their qualities for use in Earth remote sensing.	James L Garrison	Tue	12:30-1:20 pm	EE 013
ENGR 17920	8	17501					
ENGR 27920	8	17506					
ENGR 37920	8	17505					
ENGR 47921	70	22714					
ENGR 47922	8	17509					
ENGR 17912	LC8	18562					
ENGR 47920	9	17537	Drone Video: Drones (also called unmanned aerial vehicles, UAVs) can be used to handle dangerous tasks, such as inspecting buildings after earthquakes. Drones typically rely on computer vision for decision making, such as recognizing obstacles or objects of interest. This project aims to develop the solutions that can recognize objects captured by cameras mounted on drones. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu	Monday	1:30 - 2:20 pm	EE 013
ENGR 17920	9	17516					
ENGR 27920	9	17528					
ENGR 37920	9	17526					
ENGR 47921	9	22715					
ENGR 47922	9	17534					
ENGR 17912	LC6	18549					
ENGR 47920	10	17544	Electromagnetic Compatibility(EMC)/Signal Integrity: Students pursue a topic of their choosing. Topics may involve compliance procedures, testing appliances, and noise suppression. Participation in regular weekly 3-hour lab activity expected in addition to weekly scheduled lab time.	Barrett F Robinson, James V Krogmeier	Sat	9:00 - 9:50 am	EE 139
ENGR 17920	10	17538					
ENGR 27920	10	17540					
ENGR 37920	10	17539					
ENGR 47921	10	22716					
ENGR 47922	10	17543					
ENGR 47920	11	17553	Deep Reinforcement Learning based Optimal Control of Complex Systems: A growing number of complex systems from walking robots, drones to the computer Go player rely on learning techniques to make decisions to achieve optimal control of complex systems. This team investigates how to utilize deep reinforcement learning for optimal control of complex systems.	Guang Lin (guanglin@purdue.edu)	Wed	1:30 pm - 2:20 pm	EE 013
ENGR 17920	11	17545					
ENGR 27920	11	17548					
ENGR 37920	11	17546					
ENGR 47921	11	22717					
ENGR 47922	11	17551					
ENGR 47920	12	17561	Image Processing Team for Bacterial Colony Count (IBAC): Goal is to develop a batch of image processing algorithm and toolbox for biological analysis. Particular analysis will be given to imaging bacterial colony plates and providing phenotypical and statistical information in automatic fashion while conventional method is still relying on manual assessment.	Euiwon Bae (ebae@purdue.edu)	Thurs	10:30 - 11:20 am	EE 013
ENGR 17920	12	17554					
ENGR 27920	12	17557					
ENGR 37920	12	17555					
ENGR 47921	12	22718					
ENGR 47922	12	17560					
ENGR 47920	13	17568	CAM2: Embedded Computer Vision 1. Improve energy efficiency of computer vision running on embedded systems. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu, Joy Wang	Monday	2:30 - 3:20 pm	EE 013
ENGR 17920	13	17563					
ENGR 27920	13	17565					
ENGR 37920	13	17564					
ENGR 47921	13	22719					
ENGR 47922	13	17567					

Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47920	14	17576	ADEPT-m: Modeling and Visualization of Semiconductor Device Characteristics: ADEPT-m is a MatLab toolbox for simulation and analysis of semiconductor devices. The objective of this team is the development specialized device characterization modules (solar cells, MOS devices, diodes, etc.) using MatLab. Familiarity with material taught in ECE 25500 (or ECE 20001 and 20002) will be helpful. Students who have taken or are taking ECE 30500 are encouraged to enroll.	Jeffrey L. Gray	Thurs	12:30 - 1:20 pm	EE 013
ENGR 17920	14	17570					
ENGR 27920	14	17573					
ENGR 37920	14	17572					
ENGR 47921	14	22720					
ENGR 47922	14	17575					
ENGR 47920	15	17582	SoCET - System on Chip Extension Technologies: The primary objective of the SoCET team is to provide students with a comprehensive System on Chip design, fabrication, and test experience that is as similar to industry practice as possible.	Mark C. Johnson; Matthew Swabey; Timothy Rogers	Thurs	6:00 - 6:50 pm	ARMS 1021
ENGR 17920	15	17577					
ENGR 27920	15	17579					
ENGR 37920	15	17578					
ENGR 47921	15	22723					
ENGR 47922	15	17581					
ENGR 47920	16	17590	Visual and Data Analytics: Develop a visual analytic system based on sensor data using Javascript CSS and other front-end software development. A working knowledge of front end web development skills is required.	David S Ebert	TBD	TBD	POTR 127
ENGR 17920	16	17583					
ENGR 27920	16	17586					
ENGR 37920	16	17584					
ENGR 47921	16	22724					
ENGR 47922	16	17587					
ENGR 47920	17	17598	Video Analytics for Understanding Human Behavior: The success of cities and public spaces is wholly dependent on how comfortable people are within them. This study aims to use video along with environmental sensors to develop a behavioral model that can be used to predict human action during design and before construction. An accurate model can improve comfort and performance in the space. The members are expected to have finished one semester of calculus and one programming course. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu; David Barbarash	Wed	1:30 - 2:20 pm	EE 011
ENGR 17920	17	17591					
ENGR 27920	17	17596					
ENGR 37920	17	17593					
ENGR 47921	17	22725					
ENGR 47922	17	17597					
ENGR 17912	LCB	18573					
ENGR 47920	18	17607	Space Autonomous Debris Defense (SADD): The team will work to design an automated VSIC circuit integrated autonomous system to predict damage tolerance of an energy system in space operations. We will try to automate space meteorite and Space Debris impact tests. We will then develop an automated loop for integrating self healing on the go.	Vikas Tomar	Monday	5:00 - 5:50 pm	EE 013
ENGR 17920	18	17603					
ENGR 27920	18	17605					
ENGR 37920	18	17604					
ENGR 47921	18	22726					
ENGR 47922	18	17606					
ENGR 17912	LCA	18574	Not offered in Spring 2020				
ENGR 47920	19	17613	FEMTA Suborbital Spaceflight Test. FEMTA team will design and develop the hardware and software for a microgravity experiment to be flown in space on a reusable suborbital vehicle.	Alina Alexeenko	Thurday	3:00 - 3:50 pm	ARMS 3089
ENGR 17920	19	17608					
ENGR 27920	19	17611					
ENGR 37920	19	17609					
ENGR 47921	19	22728					
ENGR 47922	19	17612					
ENGR 47920	20	17618	CAM2: Embedded Computer Vision 2. Improve energy efficiency of computer vision running on embedded systems.Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu	Friday	4:30 - 5:20 pm	EE 013
ENGR 17920	20	17614					
ENGR 27920	20	17616					
ENGR 37920	20	17615					
ENGR 47921	20	22731					
ENGR 47922	20	17617					

Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47920	21	17624	CAM2: Image Database. Manage images and the metadata for computer vision research. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu	Tuesday	9:00 - 9:50 am	EE 011
ENGR 17920	21	17619					
ENGR 27920	21	17621					
ENGR 37920	21	17620					
ENGR 47921	21	22740					
ENGR 47922	21	17623					
ENGR 47920	22	17629	CAM2: Software Engineering. Create procedure for developing high-quality research software. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu	Tuesday	10:00 - 10:50 am	EE 013
ENGR 17920	22	17625					
ENGR 27920	22	17627					
ENGR 37920	22	17626					
ENGR 47921	22	22741					
ENGR 47922	22	17628					
ENGR 47920	23	17642	Image and Printing: This team will investigate several research topics of interest to our sponsors in the printing and imaging industry. The tools used include image processing algorithms, image analysis methods, and machine learning. Projects will involve considerable programming, either in MatLab, Python, or C.	Jan P. Allebach	Monday	5:30 - 6:20 pm	EE 118
ENGR 17920	23	17633					
ENGR 27920	23	17635					
ENGR 37920	23	17634					
ENGR 47921	23	22742					
ENGR 47922	23	17640					
ENGR 17912	LC9	18566					
ENGR 47920	24	17653	Forest Inventory Analysis (FIA): The value of a tree can vary dramatically by its size, species, shape, and many other parameters. forest inventory analysis (FIA) surveys a region of a forest to evaluate the current economic value of that region. This team will create a system that can perform FIA automatically. This system is equipped with sensors to acquire and analyze the data. The team's goal is to create a prototype of such a system and to demonstrate its effectiveness for improving the speed and accuracy of FIA. Interested students should consult research team website for expectations: https://purduehelps.org/join.html	Yung-Hsiang Lu; Guofan Shao; Keith Woeste	Monday	12:30 - 1:20 pm	EE 013
ENGR 17920	24	17644					
ENGR 27920	24	17647					
ENGR 37920	24	17645					
ENGR 47921	24	22744					
ENGR 47922	24	17652					
ENGR 47920	26	17662	Robotic Exploration: the team will design, build and test a set of land and water-based robots to monitor the physico-chemical conditions of watersheds.	Eric Nauman	Wed	1:30 - 2:20 pm	EE 013A
ENGR 17920	32	17733					
ENGR 27920	32	17734					
ENGR 37920	32	17736					
ENGR 47921	25	22746					
ENGR 47922	26	17664					
ENGR 17912	LC2	18524					
ENGR 47920	27	17677	Lunabotics: The team will design, build, test and prepare an autonomous robot for a lunar mining competition sponsored by NASA.	Eric Nauman	Wed	2:30 - 3:20 pm	EE 013
ENGR 17920	26	17665					
ENGR 27920	26	17666					
ENGR 37920	26	17667					
ENGR 47921	26	22747					
ENGR 47922	32	17732					
ENGR 17912	LC3	18536					

Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47920	28	17679	Beyond 5G. Investigate new communication and signal processing technologies for the next generation wireless communication systems. For junior and senior year students, ECE302 is a prerequisite or corequisite. There is no restriction for sophomore students. ECE264 is strongly recommended for junior and senior year students.	James Krogmeier, David Love, Borja Peleato, and Chih-Chun Wang	TBD	TBD	TBD
ENGR 17920	31	17726					
ENGR 27920	31	17727					
ENGR 37920	27	17678					
ENGR 47921	27	22748					
ENGR 47922	27	17681					
ENGR 47920	29	17701	AI-powered video querying over cameras. The team will build query processing engines that run on low-cost cameras, so that remote users can query videos stored on these cameras in a fast, accurate, and privacy-preserving manner.	Felix Xiaozhu Lin (xzl@purdue.edu)	TBD	TBD	TBD
ENGR 17920	27	17690					
ENGR 27920	27	17692					
ENGR 37920	28	17696					
ENGR 47921	28	22749					
ENGR 47922	28	17702					
ENGR 47920	30	17707	Digital Phenomics: Machine-vision-based novel feature extraction of characterization of wheat/rice panicles.	Dr. Mohsen Mohammadi, Dr Augusto Magalhaes de Souze, Dr. Yang Yang	Monday	10:00 - 10:50 am	EE 013
ENGR 17920	28	17703					
ENGR 27920	28	17704					
ENGR 37920	29	17706					
ENGR 47921	29	22750					
ENGR 47922	29	17708					
ENGR 17912	LC5	18548					
ENGR 47920	31	17714	Technical development CATME: Participate in technical development projects linking CATME to LMS systems like Canvas and D2L or work on accessibility code development and testing for the CATME system. Work with outside technical consultants who support CATME system.	Daniel Ferguson; Siqing Wei (wei118@purdue.edu); Matt Ohland (ohland@purdue.edu)	TBD	TBD	Wang 3500
ENGR 17920	29	17709					
ENGR 27920	29	17711					
ENGR 37920	30	17712					
ENGR 47921	30	22751					
ENGR 47922	30	17715					
ENGR 47920	32	17728	DeepFreight: Deep Reinforcement Learning based Truck Fleet Management. The goal is to develop a novel deep reinforcement-learning-based framework for autonomous management of freight transportation systems.	Vaneet Aggarwal, Assistant Professor of IE, vaneet@purdue.edu	TBD	TBD	TBD
ENGR 17920	30	17716					
ENGR 27920	30	17717					
ENGR 37920	31	17721					
ENGR 47921	31	22759					
ENGR 47922	31	17731					
ENGR 17912	LC4	18538					
ENGR 47920	33	21482	Image Based Mobile Phone Applications: The students will develop mobile phone applications that captures images of the scene and extracts information from them using tools such as machine learning.	Edward J Delp	Tuesday	5:00 - 5:50 pm	EE 013
ENGR 17920	33	21457					
ENGR 27920	33	21478					
ENGR 37920	33	21480					
ENGR 47921	71	22760					
ENGR 47922	33	21494					

Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47920	34	22683	Robomasters Robotics Projects: Design, develop, manufacture, and/or program a group of robots in preparation for the 2020 Robomasters competition in Shenzhen, China (July/Aug. 2020). Interested students should contact Dr. Michael Linnes (mlinnes@purdue.edu) to learn more about the team.	Dr. Michael Linnes	Friday	4:30 - 5:20 pm	EE 011
ENGR 17920	34	22681					
ENGR 27920	34	22682					
ENGR 37920	34	22680					
ENGR 47921	72	22763					
ENGR 47922	34	22685					
ENGR 47920	35	23031	Video Analytics for Understanding Animal Behaviour (VAA): Team will build software that applies machine learning techniques to video data to analyze animal behaviour.	A. Reibman, F. Zhu	TBD	TBD	TBD
ENGR 17920	35	23028					
ENGR 27920	35	23029					
ENGR 37920	35	23030					
ENGR 47921	73	23032					
ENGR 47922	35	23035					
ENGR 47920	36	23532	NanoHUB: Growing Global Impact Data Analytics and Machine Learning - NanoHUB serves over 1.4 million visitors annually in over 172 countries. Can we understand them better through data analytics and foster the growth of the 18,000 users who run online simulations?	Gerhard Klimeck	TBD	TBD	TBD
ENGR 17920	36	23526					
ENGR 27920	36	23527					
ENGR 37920	36	23529					
ENGR 47921	74	23534					
ENGR 47922	36	23536					
ENGR 47920	37	23541	Human-Automation Interaction - The team will develop research skills and practical data mining skills for creating publications and applications in industry in areas with emerging need and limited expertise at present.	Vincent Duffy	Thursday	1:30 pm - 2:20 pm	B013
ENGR 17920	37	23537					
ENGR 27920	37	23538					
ENGR 37920	37	23539					
ENGR 47921	75	23544					
ENGR 47922	37	23545					
ENGR 47920	38	23554	Applied Ergonomics and Safety - The team will develop research skills and practical data mining skills for creating publications and applications in industry in areas with emerging need and limited expertise at present	Vincent Duffy	Thursday	2:30 pm - 3:20 pm	B013
ENGR 17920	38	23546					
ENGR 27920	38	23547					
ENGR 37920	38	23548					
ENGR 47921	76	23555					
ENGR 47922	38	23556					
ENGR 47920	39	23814	3D imaging and image analysis - This team will work on developing 3D imaging technologies or applying 3D sensors to solve application problems	Song Zhang	TBD	TBD	ME3103
ENGR 17920	39	23810					
ENGR 27920	39	23811					
ENGR 37920	39	23812					
ENGR 47921	77	23816					
ENGR 47922	39	23819					
ENGR 47920	40	23823	AI for Happiness - This team will launch a digital platform at a community in need to improve its mental health at the individual and overall levels by developing a suite of smart connected health technologies, analytics, and models.	Nan Kong	TBD	TBD	TBD
ENGR 17920	40	23820					
ENGR 27920	40	23821					
ENGR 37920	40	23822					
ENGR 47921	78	23824					
ENGR 47922	40	23826					
ENGR 47920	41	24265	Bio-inspired Aerial Robots: The design and control of bio-inspired flapping wing robots mimicking hummingbird, insects, or larger birds. Details on the specific topic, or the specific model species, will be determined before class starts.	Xinyan Deng	TBD	TBD	TBD
ENGR 17920	41	24262					
ENGR 27920	41	24263					
ENGR 37920	41	24264					
ENGR 47921	79	24266					

Course	Section	CRN	Description	Instructor	Day	Time	Location
ENGR 47922	41	24267					
ENGR 17912	LC1	18100					
ENGR 47920	42	24413	Automation and Intelligent Construction (AutoIC) - This team leverages computer vision techniques (e.g., object detection, object localization, and object tracking) to develop a construction monitoring system.	Jiansong Zhang	Friday	2:30 pm - 3:20 pm	EE 013 (needs confirmation)
ENGR 17920	42	24405					
ENGR 27920	42	24410					
ENGR 37920	42	24411					
ENGR 47921	80	24415					
ENGR 47922	42	24416					
ENGR 47920	43	24423	Research and Development in IoT and Edge Processing in the world of Industry 4.0 (Bechtel Center): To keep our students safe, and to understand the use of the center, develop and deploy an ever-evolving network of off-the-shelf and full custom IoT platforms employing machine learning and edge processing to monitor usage, verify and enforce safety and gather analytic data.	Matthew Swabey	TBD	TBD	TBD
ENGR 17920	43	24417					
ENGR 27920	43	24420					
ENGR 37920	43	24421					
ENGR 47921	81	24424					
ENGR 47922	43	24425					
			Totals				