VIT-AP UNIVERSITY

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ENTUPLE TECHNOLOGIES

VALUE ADDED COURSE
on
SYNTHESIS AND TIMING ANALYSIS

Date	Time	Theory Session	Lab Session	Outcome
26 Oct & 27 Oct	06:30 PM - 08:30 PM	Introduction to backend flow, Inputs and outputs of synthesis, Synthesis	Paper assignment on combinational code conversions to gates	Understanding of backend flow and introduction to synthesis
29 Oct & 02 Nov	06:30 PM - 08:30 PM	Types of synthesis, Command flow of synthesis	Paper assignment on combinational code conversions to gates	Complete understanding of the synthesis flow
05 Nov & 08 Nov	06:30 PM - 08:30 PM	Static timing analysis, Timing paths, Timing slack calculations	Assignment on timing slack calculations	Calculating the timing slack
10 Nov & 12 Nov	06:30 PM - 08:30 PM	Constraint designing, Report analysis of timing paths, MMMC,OCV	Assignment on timing slack calculations with constraints	Designing the timing constraints
		Project	Synthesis and perform STA	Generate Netlist and Reports

VIT-AP Coordinators:

Dr. Jayendra Kumar

Dr. Umakanta Nanda

Industry representatives:

Mr. Damodara Sambashiva

Mr. Srinivas Bhaskarabhatla

Miss. Divyavani SM

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Advanced Digital design using Verilog HDL

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

Verilog HDL is one of the widely used coding language for designing hardware modules in digital system IC design. It is used by most of the VLSI industries. The current course emphasizes on training students on advanced Verilog HDL coding concepts with example designs and to develop essential skills required to do projects on advanced digital design using Verilog HDL. The course also focuses on developing ability to understand any digital system specification in depth and to design its architecture at system and sub-system level

Course Benefits : -

- The students will be able to understand Verilog HDL concepts and will be able to apply them to design advanced digital system specifications
- The students will be able to design advanced arithmetic circuits using Verilog HDL
- The students will be able to design and model DSP functions and floating point operations using Verilog HDL
- The students will be able to design neural network components using Verilog HDL

EVERY MONDAY 11.00 AM to 01.00 PM

Commence from 21-02-2022.

Certificate after completion of course

Instructors : Dr. Purnachand Nalluri & Dr. Deepak Kumar Panda

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Advanced Communication for 5G and beyond

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

In the recent times, the substantial enhancement in the acquisition of mobile devices has lead to the tremendous advancements in the wireless communication industry throughout the globe. An extensive diversification of wireless applications in the 3G, 4G, 5G and beyond which includes the multimedia-integrated voice-video communication, many interactive live streaming sessions like the video conferencing, multiuser gaming, etc., can be witnessed. Consequently, to cater the needs of every individual, it is of immense prerequisite to deploy the modern and futuristic wireless communication technologies. The fast-evolving and latest wireless communication technologies such as the OFDM, MIMO, CDMA, NOMA, etc., play a vital role in meeting the demands of multiple users. Therefore, it is necessary for the students to substantially grasp all the fundamental aspects and the design issues behind the implementation of such technologies. Eventually, thorough understanding of this course will enable the students to implement future projects in the diverse areas of RF communications, OWC, FSOWC, etc.

Course Highlights :-

- ★ Students will get a strong emphasis on the new trends in mobile/wireless communications
- ★ Students will thoroughly learn the mathematical modelling behind the implementation of the current state-of-the-art aspects in wireless communication technologies.
- ★ Students will get acquainted to the emerging technologies such as the radio frequency communication, free space optical communication, light detection and ranging, light fidelity, optical camera communication, optical wireless communication, etc.

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 01-03-2022.

Certificate after completion of course

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Advanced Cryptographic Algorithms and their FPGA Implementations

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

The importance of cryptography applied to security in hardware has gained essential relevance during the last few years. Everyday, many users generate and interchange large amount of information in various fields and all these have to work on one or the other kind of hardware. These and other examples of applications deserve a security point of view, not only from a software perspective but also from a hardware perspective. This can be achieved by hardware implementations, i.e. on an FPGA, to achieve better security. In addition to implementing the cryptographic algorithms in hardware, it is necessary to have countermeasures for attacks. Various attacks are employed by intruders to get into our systems and steal sensitive data. The best and most assured way to counter is through implementing the countermeasures in hardware. This course deals with all these methods and implementations in a way that is very easy to understand.

Course Highlights : -

- Students will be able to understand Cryptographic algorithm concepts and will be able to apply them to counter the attacks on these algorithms.
- Students will be able to design advanced cryptographic architectures & circuits and implement them on FPGA.
- Students will be able to design and model various faults & attacks on Cryptographic algorithms using FPGA.
- Students will be able to design countermeasures for the attacks on FPGA.

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 21-02-2022.

Certificate after completion of course

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Advanced Digital Video Processing

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

Digital videos and images are used in wide variety of applications including industrial, consumer and many scientific applications. The Digital video processing and coding is one of the essential task for video streaming, video communications, video broadcasting and video storage applications. It is an ever growing technology as the multimedia content is ever growing in internet video. The current course focuses on various video compression algorithms and its coding tools and gives a practical approach in compressing raw video formats. The course also emphasizes on doing some mini projects on digital video compression algorithms.

Course Benefits : -

- The students will be able to understand various concepts of digital video processing and blocks of digital video encoder and decoder
- The students will be able understand various transform and quantization techniques and design a basic software based transformation and quantization for a digital video.
- The students will be able to understand various algorithms of motion estimation, motion compensation and intra-prediction and will be implementing some algorithms for the same.
- The students will be able to understand various filters used in video processing and will be able to design the filter algorithms for a digital video.
- The students will be able to understand various entropy coding and decoding algorithms used in digital video compression and design & implement variable length and arithmetic coding/decoding algorithms.

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 21-02-2022.

Certificate after completion of course

Instructors : Dr. Purnachand Nalluri & Dr. Ravindra Dhuli

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Simulation, Modeling and Application of Advanced Semiconductor Devices

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

Simulation and physics-based modeling of the various electrical parameters of semiconductor devices is an important area of study and research, which leads to the development of semiconductor technology. Analytical modeling of various parameters provides the physical understanding of the device characteristics, and TCAD-based simulation helps us to get first-hand information about the behaviour of any proposed device without going through an expensive experimentation and fabrication, and complex mathematical modeling. The main objective of this course is to introduce various TCAD tools (Synopsys Sentaurus, Visual and Silvaco ATLAS TCAD tools) to get the students acquainted with the simulation techniques used for the performance analysis of advanced semiconductor devices along with analytical modeling of various electrical parameters. Moreover, Verilog-A will also be introduced which is used to verify the compact model of semiconductor devices along with circuit simulation using Cadence tool. This course includes the practical sessions as well.

Course Benefits : -

- Students will learn many important TCAD tools widely being used in the field of semiconductor devices.
- They will be able to model any parameter of various advanced semiconductor devices.
- They will learn about the verification of compact models using Verilog-A and circuit simulation using cadence tools.
- It will be very helpful while going for a capstone project, senior design project, higher studies, research and getting a job in semiconductor and VLSI based industries.

EVERY MONDAY 09.00 AM to 11.00 AM

Commence from 14-02-2022.

Certificate after completion of course

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A Vision of Industry 4.0 from Artificial Intelligence

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

The latest trend in the manufacturing industry involves Industry 4.0, artificial intelligence, and IoT aiming to improve manufacturing processes through computer technology which helps to improve automation and productivity. These technologies became the sources of the largest integrated employment of the manufacturing industry after automation. This course adds value to engineering graduates as a vision in understanding the industry 4.0 applications supported with AI which enables them to explore the many top-notch technologies.

Course Highlights : -

- To gain Knowledge of machine learning and artificial intelligence concepts.
- To understand the various algorithms in Computer vision.
- To explore the industrial manufacturing Use cases and its Digitalization.
- To understand the deployment of AI and ML towards the enrichment of Industry 4.0

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 28-02-2022.

Certificate after completion of course

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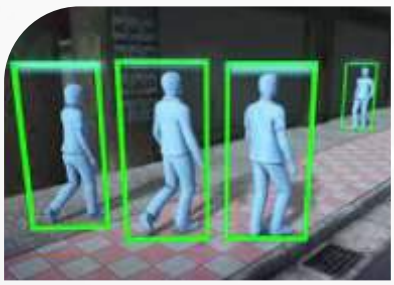
Biomedical Signal and Image Processing using Machine Learning

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

Biomedical signal and image processing aims at extracting significant information from biomedical signals (ECG, EEG, EMG, etc) or images (CT-scan, X-ray, MRI, etc). With the aid of biomedical signal processing, biologists can discover new biology and physicians can monitor distinct illnesses. Machine learning (ML) is the study of computer algorithms that can improve automatically through experience and using data. Machine learning algorithms build a model based on sample data, known as training data, to make predictions or decisions without being explicitly programmed to do so. ML methods can be employed to assist clinicians in making correct and timed decisions in disease diagnosis.




Course Highlights : -

- Fundamentals of Digital Signal (ECG, EEG, EMG, etc.) and Image Processing.
- Fundamentals of Machine Learning
- Applications of ML in Image Processing
- Applications of ML in Biomedical Signals
- Projects/ Demo on real-time problems

EVERY MONDAY 11.00 AM to 01.00 PM

Commence from 07-03-2022.

Certificate after completion of course

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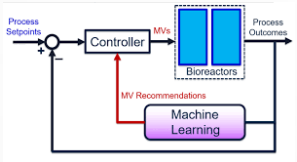
Classical and Modern Controller Design for Practical Systems

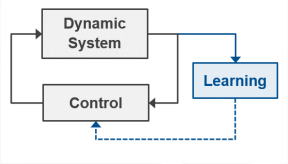
(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

In this value added program, controllers – both classical and modern are designed and implemented for practical system models. This course provides the basics of system modelling, controller design and implementation using MATLAB software. This enables the students to analyze and design different types of control methods for practical problems. At the end of the course, student will be equipped with knowledge to identify and design a controller for a real time system.





Course Highlights : -

- Design and implementation of classical controllers in MATLAB Simulink
- Design of AI/modern controllers in MATLAB Simulink
- Design of ML based controllers in MATLAB Simulink
- Simulation of practical cases

EVERY MONDAY 11.00 AM to 01.00 PM

Commence from 21-02-2022.

Certificate after completion of course

Proposed By : Dr. D. John Pradeep & Dr. Y. V. Pavan Kumar

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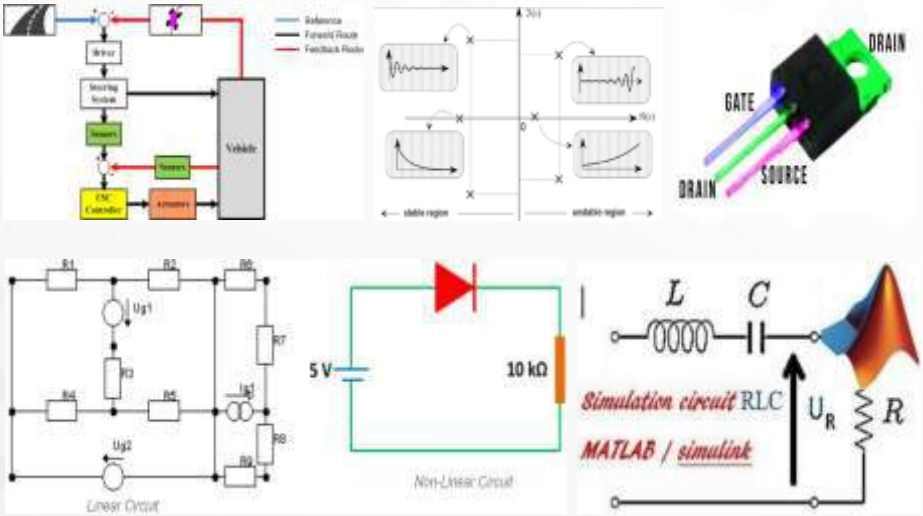
Modelling and Analysis of Linear and Nonlinear Circuits

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

In this value added course, the difference between a linear and nonlinear systems is presented. A mathematical treatment of modelling concepts of these systems are dealt with using most general transfer function form and state space model form. This is followed by the modelling of linear and nonlinear circuits. Finally, the modelled system is tested for stability using various plot-based methods and also the effect of system parameters on the stability is also probed. At the end of the course, student will be able to understand the theory behind system modelling and also be able to model real-time systems of known dynamics. The tool used for the analysis is MATLAB/Simulink.



Course Highlights :-

- Introduction to System Modelling
- Modelling of linear circuits
- Modelling of nonlinear circuits
- System stability analysis

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 21-02-2022.

Certificate after completion of course

Proposed By : Dr. Y. V. Pavan Kumar & Dr. D. John Pradeep

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Smart Communication Systems and IoT

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

Nowadays the fast World led to great advances in wireless technology and smart communications in every sector.

The digital revolution was generated by the need for the telephone network as well as the internet network. A further technology boost was given by IoT technology. Which is led to the key role in smart communications.

This text is organized for communication technology students at the advanced level and it presents, information about the basic systems of smart communication, process and application with IoT.

Course Highlights : -

- Students will learn about advance communication
- Students will learn how the smart communication will work
- Learn about recent tends of IoT in advance network
- Learn about the different technology used in smart communications

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 21-02-2022.

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Research Oriented Speech Processing Applications using Machine Learning

(A Value Added Course)

offered by

School of Electronics Engineering (SENSE)

The main objective of this course is to present different techniques of speech processing by bringing together the scattered research areas including Automatic Speech Recognition (ASR), Speaker Identification, and Speech Enhancement. A key application of Machine learning (ML) algorithms has been in analyzing and processing speech. Nowadays, speech interfaces have become widely accepted and integrated into various real-life applications and devices. Services like Siri and Google Voice Search have become a part of our daily life and are used by millions of users. Research in speech processing and analysis has always been motivated by a desire to enable machines to participate in verbal human-machine interactions. The research goals of enabling machines to understand human speech, identify speakers, and detect human emotion have attracted researchers' attention for more than six decades. By realizing the significance of research in Speech processing the Value Added Course (VAC) is introduced to train and motivate the aspirants to learn the basics of Speech processing, that to initiate research and developments in applications of Speech Processing.





Course Benefits : -

- Speaker Identification using Supervised Learning
- Cocktail Party source Separation
- Speech Recognition
- Speech Enhancement
- Parametric Modelling of Speech Signal

EVERY MONDAY 03.00 PM to 05.00 PM

Commence from 07-03-2022.

Certificate after completion of course