SDR EVENT

May 28th, 2019
R1 1.67

17:00 – 18:00 Registration (incl Tea & Coffee)
18:00 – 18:15 Introduction by dr. Anne Otterlo
18:15 – 18:40 SDR in 5G mobile phones by Prof. Sonia-Heemstra
18:40 – 19:05 HAM radio research by dr.ir. Peter Smulders
19:05 – 19:20 HAM radio at Fontys by ir. Duncan van Meeteren
19:20 – 19:45 coffee break
19:45 – 20:10 SDR in car radios by Dr. ir. Evert-Jan Pol (Catena)
20:10 – 20:35 Hacking cars using SDR by two ethical hackers
20:35 – 21:00 Tours
21:00 – 21: 30 Drinks & networking

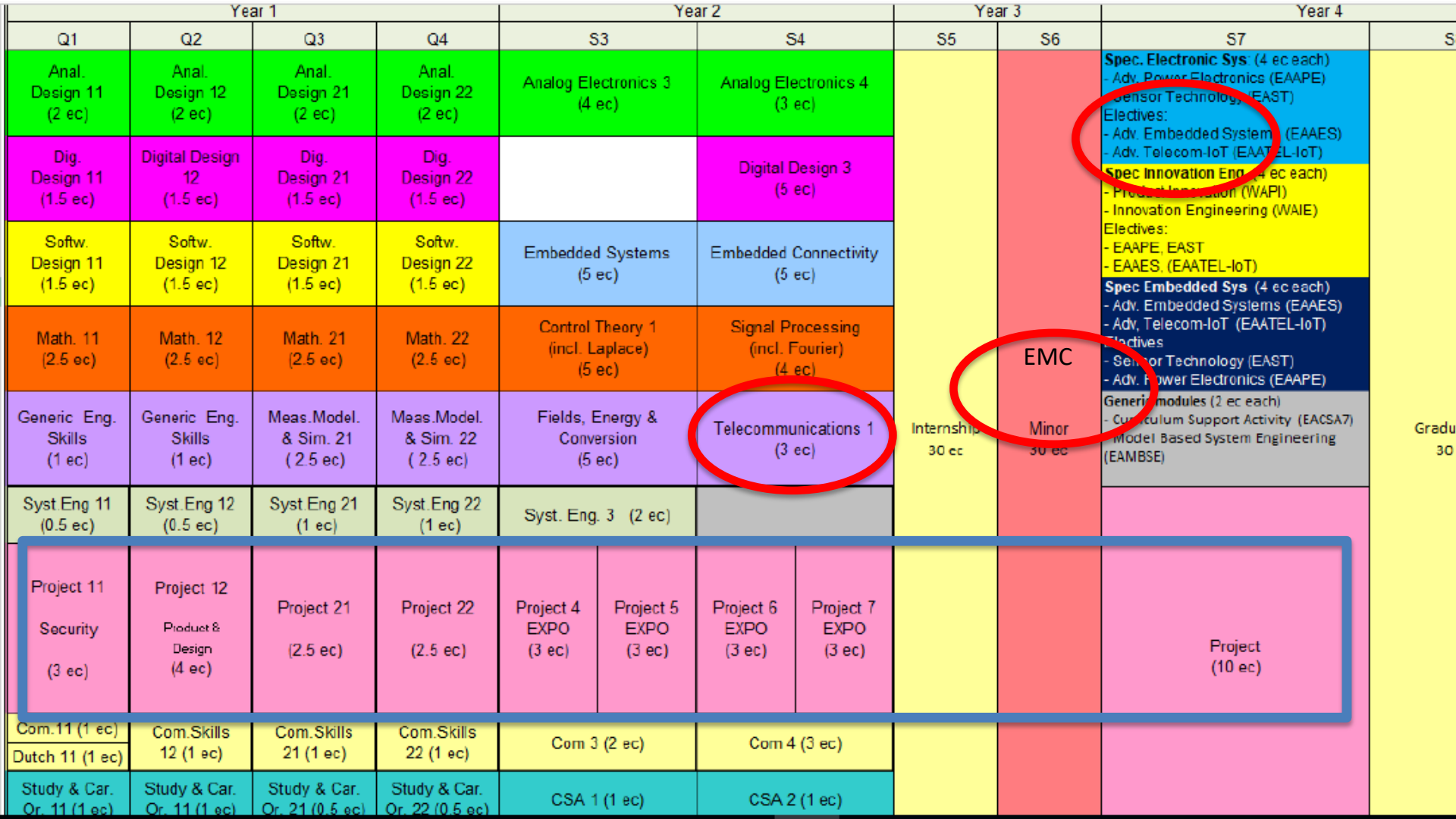
HAM Radio in Engineering Curriculum

by Duncan van Meeteren
Fontys Lecturer

Electrical & Electronic Engineering

- a 4-years English taught bachelor programme that leads to the international Bachelor of Science (BSc) degree
- As a student they are trained to become an electronic engineer in product design
- Designing has an intrinsically multidisciplinary character and requires technology based knowledge but also project management skills

	Hogeschool	Basis BoKs	BoKS Industriële Automatisering	BoKS Energie	BoKS Elektronica	BoKS Embedded systemen
1	Avans Breda	X	X	X		
2	Avans Den Bosch	X	X			X
3	Fontys Eindhoven	X			X	X
4	Haagse Hoge School	X		X	X	X
5	HAN Arnhem en Nijmegen	X	X	X		X
6	Hanze Assen	X				X
7	Hanze Groningen	X				
8	Hogeschool Zuijd	X				
9	Hogeschool van Amsterdam	X				
10	In Holland - Alkmaar	X	X		X	X
11	NHL Hogeschool	X	X		X	X
12	Rotterdam	X		X		X
13	Saxion	X	X	X	X	X
14	Utrecht	X	X			
15	Windesheim	X		X		X


Year 1
Year 2
Year 3
Year 4
Q1
Q2
Q3
Q4
S3
S4
S5
S6
S7
Anal. Design 11 (2 ec)
Anal. Design 12 (2 ec)
Anal. Design 21 (2 ec)
Anal. Design 22 (2 ec)
Analog Electronics 3 (4 ec)
Analog Electronics 4 (3 ec)
Spec. Electronic Sys (4 ec each)
- Adv. Power Electronics (EAAPE)
- Sensor Technology (EAST)
Electives:
- Adv. Embedded Systems (EAAES)
- Adv. Telecom-IoT (EAATEL-IoT)
Dig. Design 11 (1.5 ec)
Digital Design 12 (1.5 ec)
Dig. Design 21 (1.5 ec)
Dig. Design 22 (1.5 ec)
Digital Design 3 (5 ec)
Spec Innovation Eng (4 ec each)
- Product Innovation (WAPI)
- Innovation Engineering (WAIE)
Electives:
- EAAPE, EAST
- EAAES, (EAATEL-IoT)
Softw. Design 11 (1.5 ec)
Softw. Design 12 (1.5 ec)
Softw. Design 21 (1.5 ec)
Softw. Design 22 (1.5 ec)
Embedded Systems (5 ec)
Embedded Connectivity (5 ec)
Spec Embedded Sys (4 ec each)
- Adv. Embedded Systems (EAAES)
- Adv. Telecom-IoT (EAATEL-IoT)
Electives
- Sensor Technology (EAST)
- Adv. Power Electronics (EAAPE)
Math. 11 (2.5 ec)
Math. 12 (2.5 ec)
Math. 21 (2.5 ec)
Math. 22 (2.5 ec)
Control Theory 1 (incl. Laplace) (5 ec)
Signal Processing (incl. Fourier) (4 ec)
EMC
Generic Eng. Skills (1 ec)
Generic Eng. Skills (1 ec)
Meas.Model. & Sim. 21 (2.5 ec)
Meas.Model. & Sim. 22 (2.5 ec)
Fields, Energy & Conversion (5 ec)
Telecommunications 1 (3 ec)
Internship 30 ec
Minor 30 ec
Generic modules (2 ec each)
- Curriculum Support Activity (EACSA7)
- Model Based System Engineering (EAMBSE)
Gradu 30
Syst Eng 11 (0.5 ec)
Syst Eng 12 (0.5 ec)
Syst Eng 21 (1 ec)
Syst Eng 22 (1 ec)
Syst. Eng. 3 (2 ec)
Project 11 Security (3 ec)
Project 12 Product & Design (4 ec)
Project 21 (2.5 ec)
Project 22 (2.5 ec)
Project 4 EXPO (3 ec)
Project 5 EXPO (3 ec)
Project 6 EXPO (3 ec)
Project 7 EXPO (3 ec)
Project (10 ec)
Com.11 (1 ec)
Dutch 11 (1 ec)
Com.Skills 12 (1 ec)
Com.Skills 21 (1 ec)
Com.Skills 22 (1 ec)
Com 3 (2 ec)
Com 4 (3 ec)
Study & Car. Or. 11 (1 ec)
Study & Car. Or. 11 (1 ec)
Study & Car. Or. 21 (0.5 ec)
Study & Car. Or. 22 (0.5 ec)
CSA 1 (1 ec)
CSA 2 (1 ec)

TEL1t

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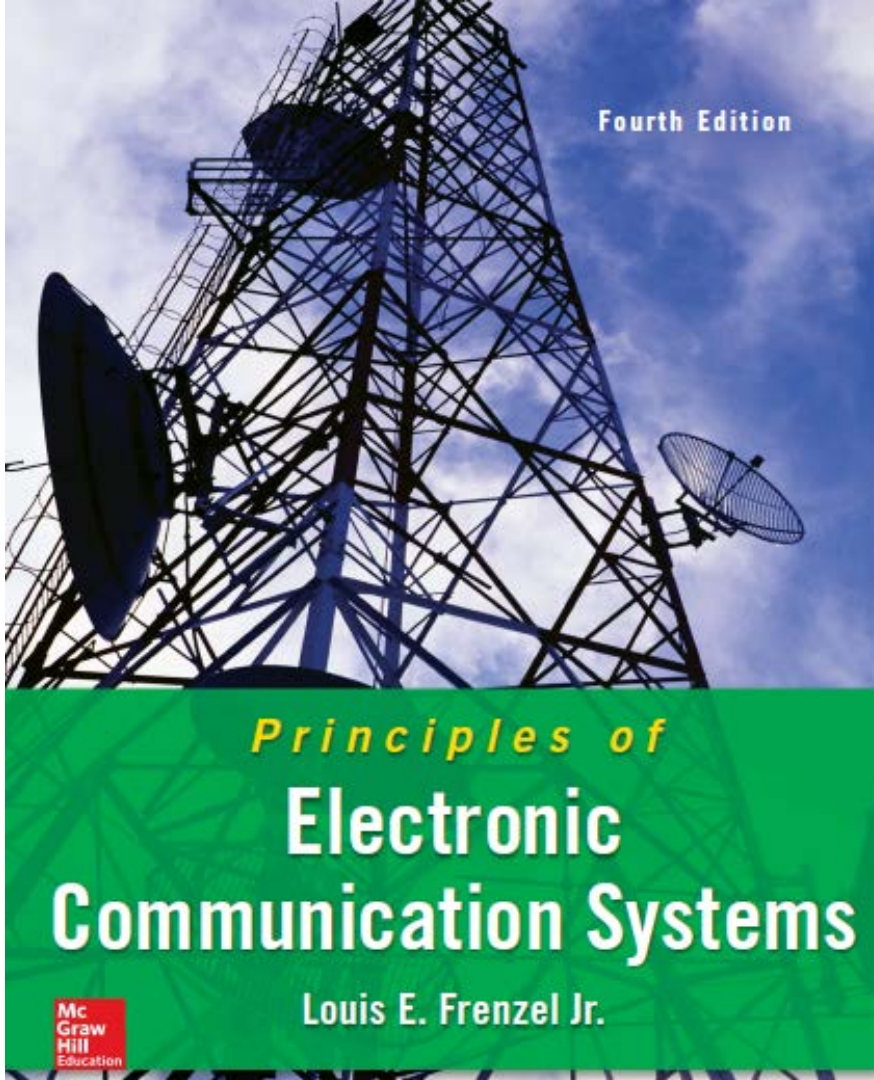

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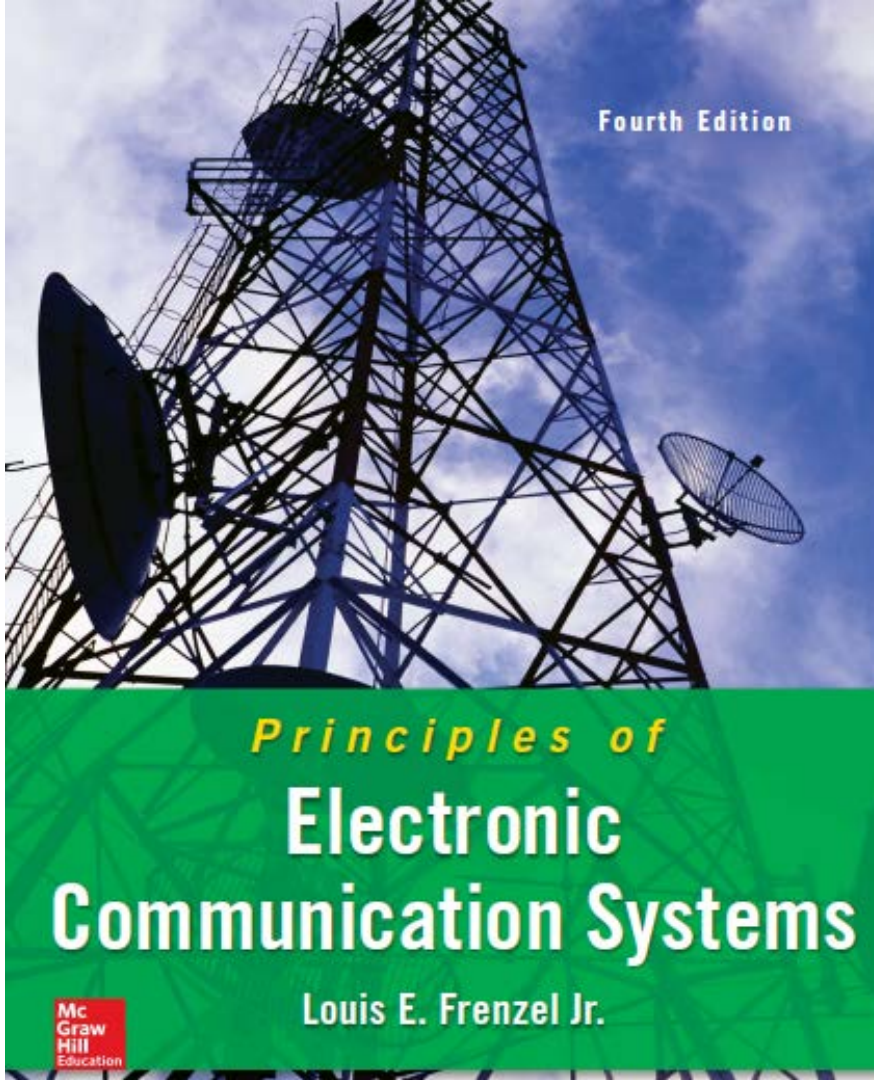

Adv Tel theory

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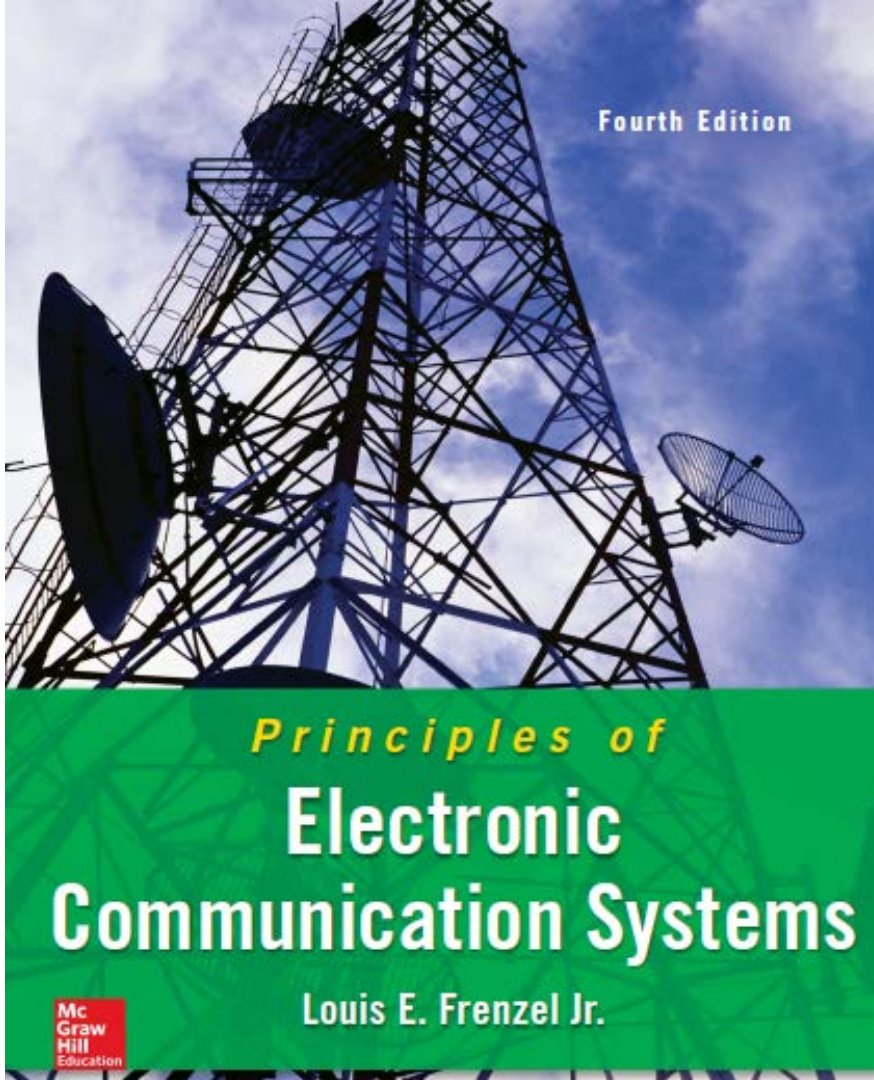

Adv Tel theory

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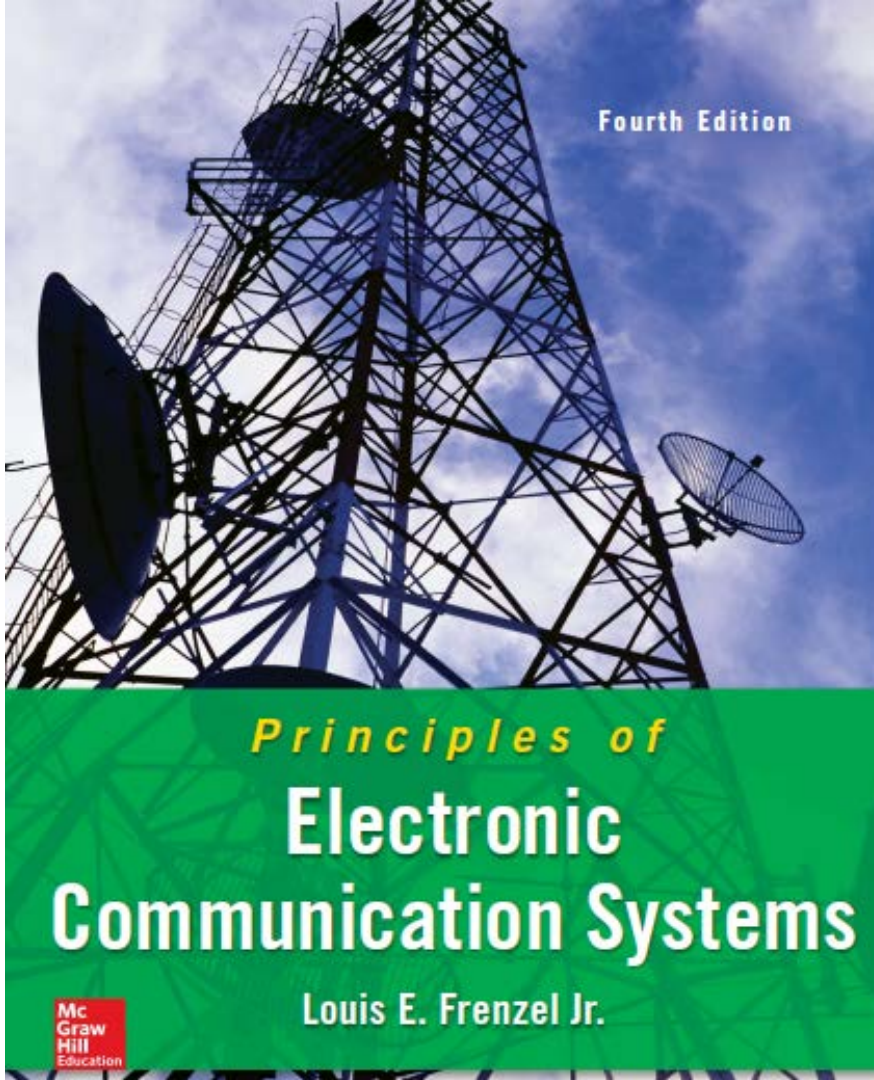

System thinking TEL1p

Course AM/FM modulation/demodulation

Includes:

- 1 Experiment card with Colpitts/Hartley oscillator
- 1 Experiment card with AM modulator/demodulator, AM modulator switchable between AM/DSB, product demodulator and diode detector
- 1 Experiment card with FM modulator/phase demodulator
- CD-ROM with Labsoft browser and course software

Course contents:

- Introduction to the principle of amplitude modulation by measuring AM modulator signals over time
- Recording the modulation trapezoid for various modulation depths
- Demodulation of an amplitude modulated signal
- Introduction to the principle of a diode detector

Product

"*A product without **wireless** connectivity is no product*"

- Kiwa

“Smart products”

August Smart Lock Pro 3rd Generation

HIGHLIGHTS

- Check your doors status when you are away from home
- Provide key codes to friends and family and use auto lock feature when you leave the house
- You need the Connect Wifi Bridge accessory device ($79) to control it remotely

WiFi

Ellipse by Lattis

HIGHLIGHTS

- Automatic keyless entry using Bluetooth
- Backup: Key in a personal code of up to eight characters to lock or unlock
- Built-in rechargeable battery using solar

Bluetooth

Keen Home Smart Vent

HIGHLIGHTS

- Room-by-room Control (Typical house needs 4-8 smart vents) and auto-balancing mode
- Integrations with Nest, SmartThings, Lowes Iris
- Battery life: 2+ years and 802.15.4/ZigBee Comms

Zigbee

Amazon Echo

HIGHLIGHTS

- Seven microphones and beam forming technology so it can hear you from across the room
- WiFi and Bluetooth Connectivity
- Controls lights, switches, and thermostats with compatible WeMo, Philips Hue, Samsung SmartThings, Wink, Insteon, Nest, and ecobee smart home devices

WiFi & Bluetooth

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Wireless connectivity

- Hands-on
- Real-time data

Receiving radio waves

Onderzoek , Campus 20/05/2014

Geen dak meer voor amateurradiostation

Geen onderdak, en geen dak, zal er nog zijn voor het amateurradiostation ESRAC wanneer eind 2014 de faculteit Electrical Engineering gaat verhuizen van Potentiaal naar Flux. Het station is in 1981 opgericht als dispuut van Electrical Engineerings studievereniging Thor en staat de laatste jaren in de mondiale top 10 bij zendwedstrijden. "Het einde van het amateurradiostation op de TU/e is doodjammer."

door Norbine Schalij

In twee oude practicumlokalen op de dertiende verdieping van Potentiaal komen nog enkele keren per week actieve leden van de Eindhovense studentenradioamateurvereniging bijeen. De apparatuur waar zij mee zenden, is van hoge kwaliteit. “Het is het best uitgeruste radiostation van Nederland, en

Fontys

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2014 approach

1. Contact with the Maxwell Foundation, MORSE Team
2. Find room for shack
3. Find antenna location
4. Call sign
5. Coax

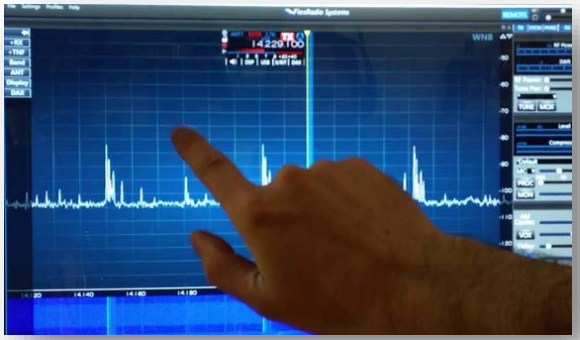
Radio shack in R1-0.180

Rigs 2014
1) FT-857d
2) …

Radio rigs in R1-0.180

Rigs for students use >2014

1) FT-857d
2) Anytone D878UV VHF/UHF
3) Yaesu ftd100
4) Icom ID-51E
5) KIVI Engineering Society → FLEX6500



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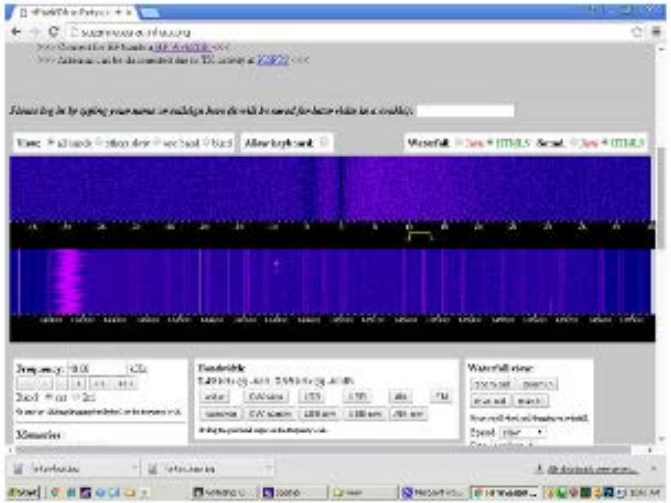
Antenna platform

1) 2-4-6 meter antenna
2) 2m and 70 cm antenna
3) 40 m to 6 m antenna Vert
4) Wide Band Loop antenna
5) Discone antenna
6) Hexial Beam antenna
7) Satellite antenna
8) Weather satelliet antenna

WebSDR 24/7

VHF/UHF WebSDR



vhf.pi5fts.nl

HF WebSDR

hf.pi5fts.nl

Thanks to Pieter Tjerk de Boer PA3FWM for creating WebSDR !

Call sign Pi5FTS

- AT: Teacher must have license
- Prefix “Pi5” = Opleiding stations

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HAM community → ESRAC

- www.esrac.nl
- Eindhovense Studenten Radio Amateur Club
- For Fontys & Tu/e students

TEL1p

TELECOMMUNICATION 1 practical's 2019

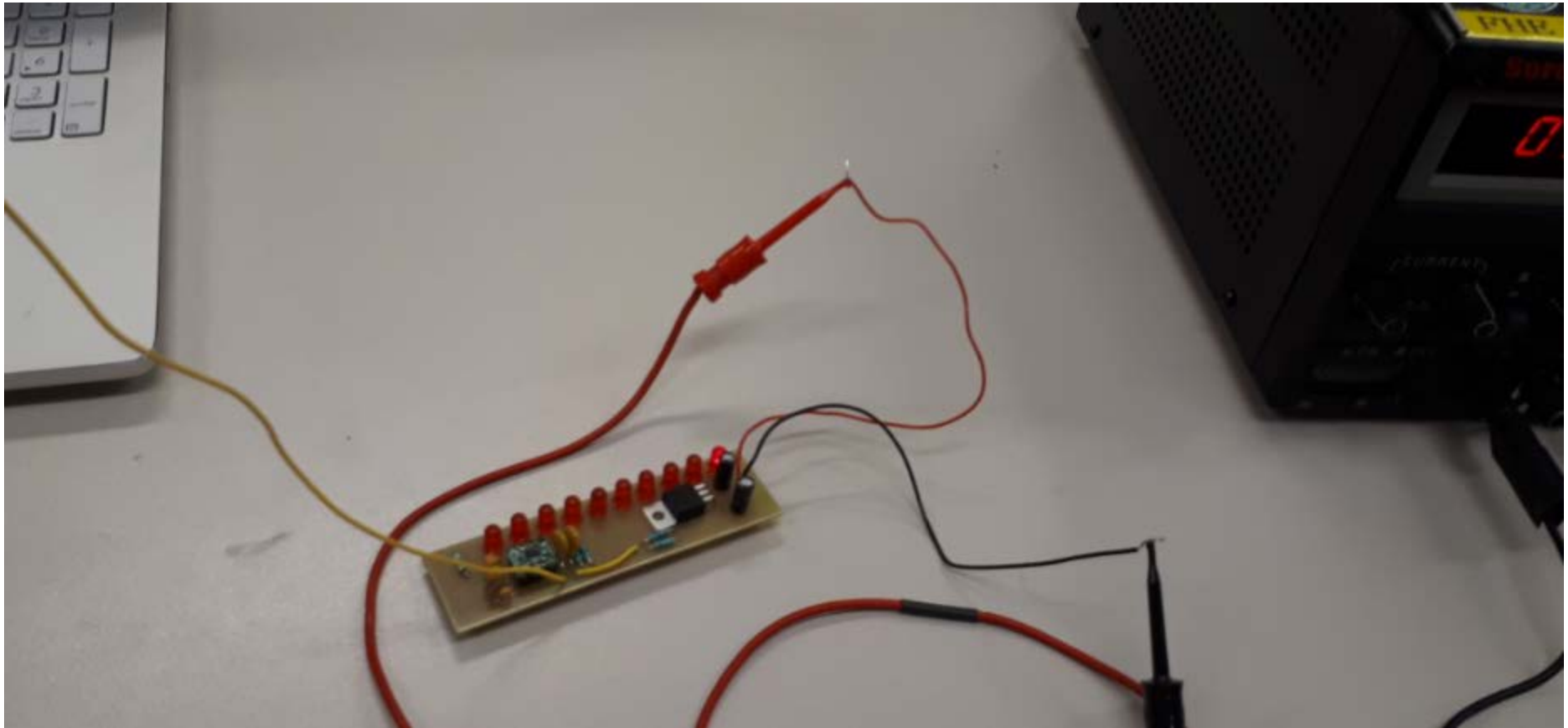
You are allow to work together with max. 2 persons on each assignment. The assignments have a max. duration of 2 weeks; one week for the preparations or to order components and the other week to perform the assignment.

Assignment	Project name	Description and task(s)
1	Web SDR	Use the HF WebSDR (http://hf.pi5fts.nl/) to listen to the strongest band (80 40 m 20m 6m 4m) available, based on Solar and geomagnetic data. Write down the frequencies were some communications can be heard. Write down the modulation, signal strength. How radio Amateurs know which RF output power level the may use and which frequency they may transmit etc.
2	Walky-talky test	The team receives two walki-talky from Motorola. Find out the RF output power level, calculate and measure the maximum range. Measure the output frequency. May you use this device with or without license? What does CTCSS mean and how to use it?
3	FLEX6500	Make a real QSO with the SDR transceiver with another HAM radio operator. Write down the CALL of the operator and the RIG + antenna he/she uses. Calculate the distance between you and the other operator(s). Write down your RF output power level, the SWR and modulation. Is also allowed to use Digital modes.
4	Dstar	Use a dedicated digital ICOM radio to make a connection to a

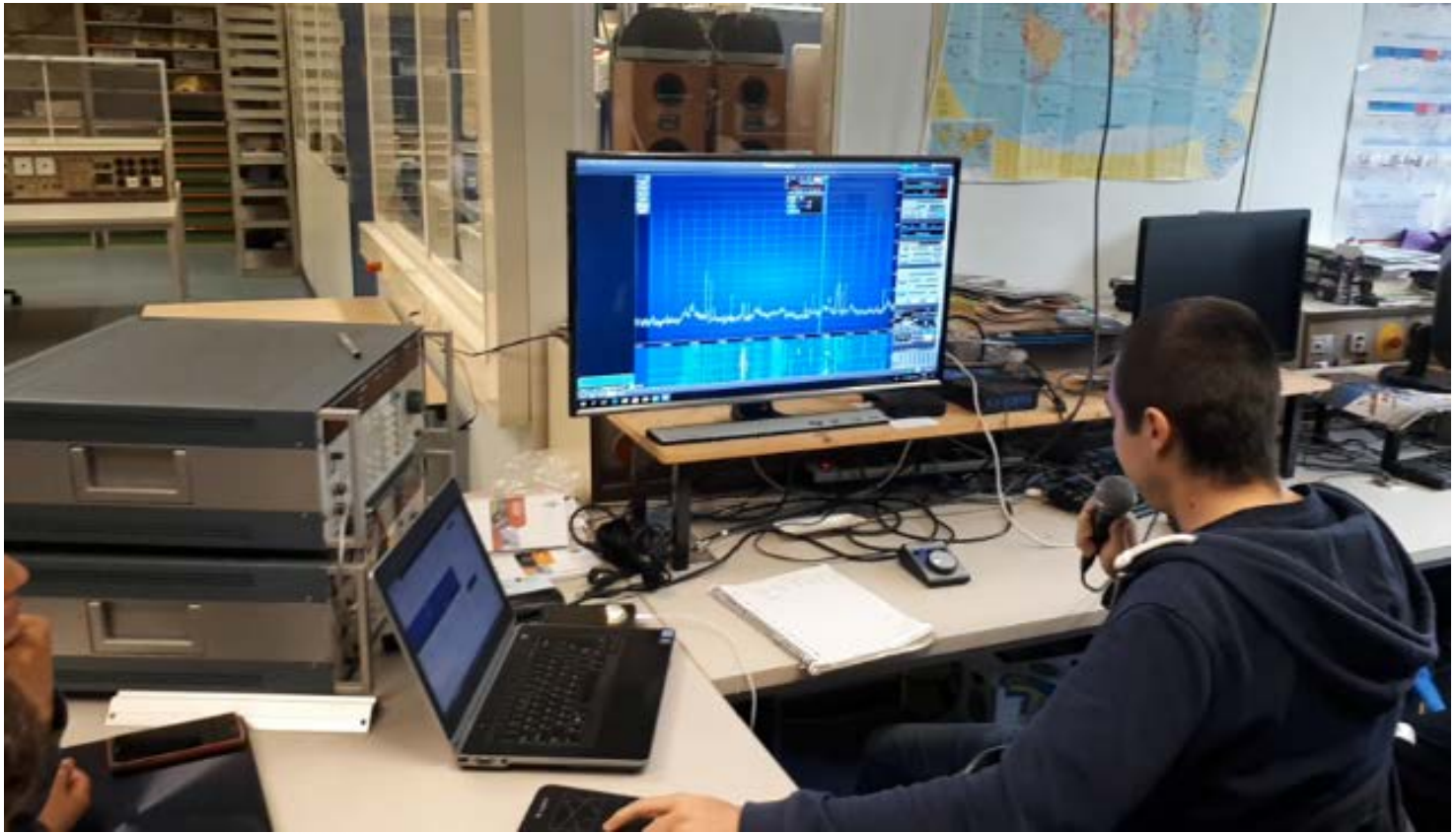
Fontys University of Applied Sciences

THINK GGER

TEL1p RF sniffer



FLEX6500



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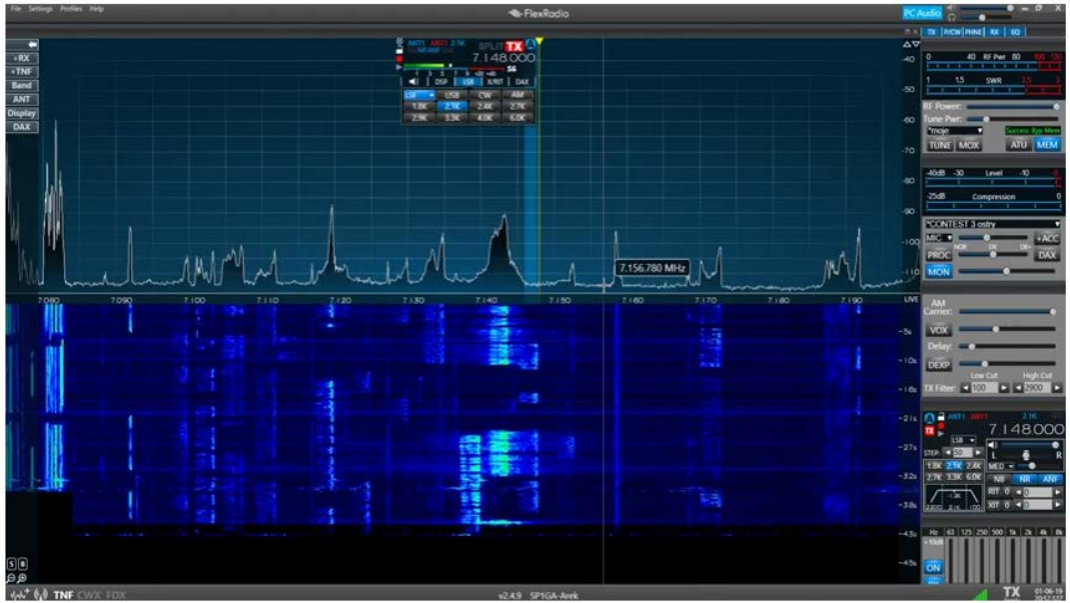
FLEX6500



Flex 6500 cool transceiver :)

188 views 4 0 SHARE SAVE ...

https://www.youtube.com/watch?v=uyHDQwpmtdM

EXPO IPD

EXPO (Engineering eXperience Project Organization), 10 weeks, 2nd year
IPD (Integrated Product Development), 20 weeks, 4th year students

Fontys

1 Title of assignment

2 Organization information

Company		**Fontys Hogeschool Engineering**	
Company :		Project duration	O 10 weeks (EXPO, 2nd year)
		Company contact person :	
Address:		Telephone:	
Zip code & city		E-mail	

Indicate the need for the type of students in the team and the number if possible 7 students per team)

Mechatronical Engineering		**Mechanical Engineering**		**Electrical Engineering**	
(..)	Construction and mechanics	(..)	Control systems	(..)	Analogue
(..)	Control systems	(..)	Production and Materials	(..)	Digital/embedded
(..)	Embedded systems	(..)	Energy and process	(..)	Control
(..)	Robotics	(..)	Construction and mechanics	(..)	Datacom/telecom

3 Preface

<your company, current products, etc.>

4 Problem description

<context, problem of customer, etc.>

5 Assignment description

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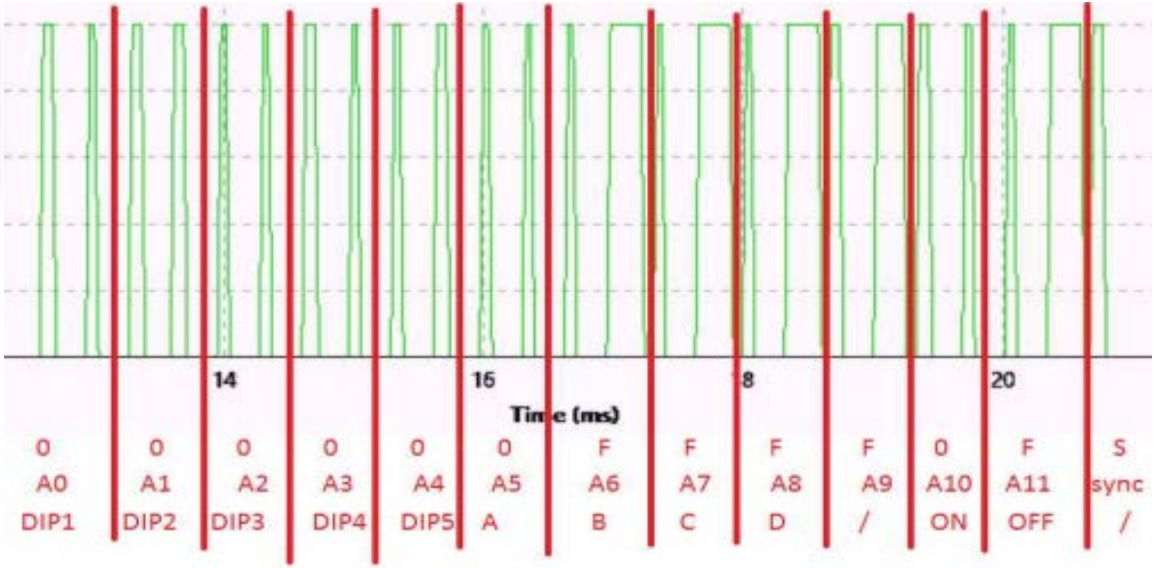
EXPO

Fontys
University of Applied Sciences

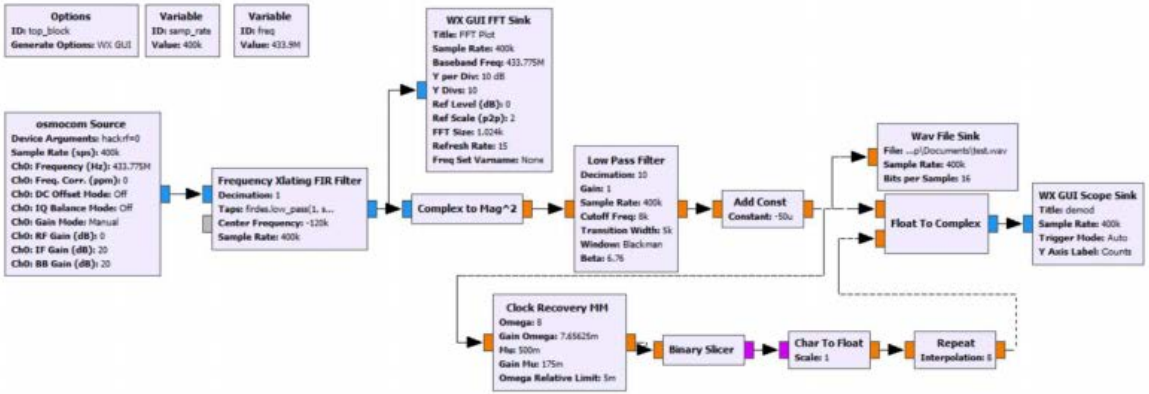
Onderzoeksdocument

PROJ5, EXPO 34

Proje
Vince
Roy F
Stijn
Bas J
Joost
Kevin
Coen



Figuur 8 Signaal analyse benoemde bits



EXPO

- Anti-drone system with HackRF

IPD

https://www.fontys.nl/nieuws/winnend-track-and-trace-bijenproject-krijgt-vervolg/

Share Tweeten Like 0

19 mei 2017

Winnend Track and trace bijenproject krijgt vervolg

Een groep internationale studenten van Fontys Hogeschool Engineering heeft vorig jaar de Denk Groter Prijs, categorie studenten, gewonnen met Track and trace van bijen? Wat was het ook al weer voor project? We kijken terug met docent Duncan van Meeteren die de studenten voordroeg voor de prijs.

Een viertal Electrical & Electronic Engineering (EEE) studenten hadden in februari 2016 een opdracht gekozen waar ze een semester lang aan mochten gaan werken. De opdracht die zij gekozen hadden kwam vanuit de Wageningen Universiteit en Wageningen Environmental Research (Alterra). De opdracht was om een autonoom track & trace systeem te ontwikkelen voor bijen. Met dit systeem wilde de onderzoekers uiteindelijk een antwoord krijgen op de bijensterfte. Elke bij kreeg op de rug een hele kleine RFID chip, met een uniek ID nummer. Wanneer de bij in de buurt kwam van het detectiesysteem van de studenten werd de ID ingelezen. Vergelijkbare systemen kunnen dat ook, maar niet verschillende bijen in één keer. Uit technisch oogpunt was dit een goed project, maar er was nog een ander belangrijk aspect. De studenten moesten in korte tijd ook laten zien dat ze beschikten over de engineering skills van de 21e eeuw, waarbij creatief en kritisch denken de hoofdpunten waren.

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IPD Bee project

- Spectrum analyser
- Antenna matching NWA
- PCB design EMC

https://youtu.be/7OWwmhq1msU

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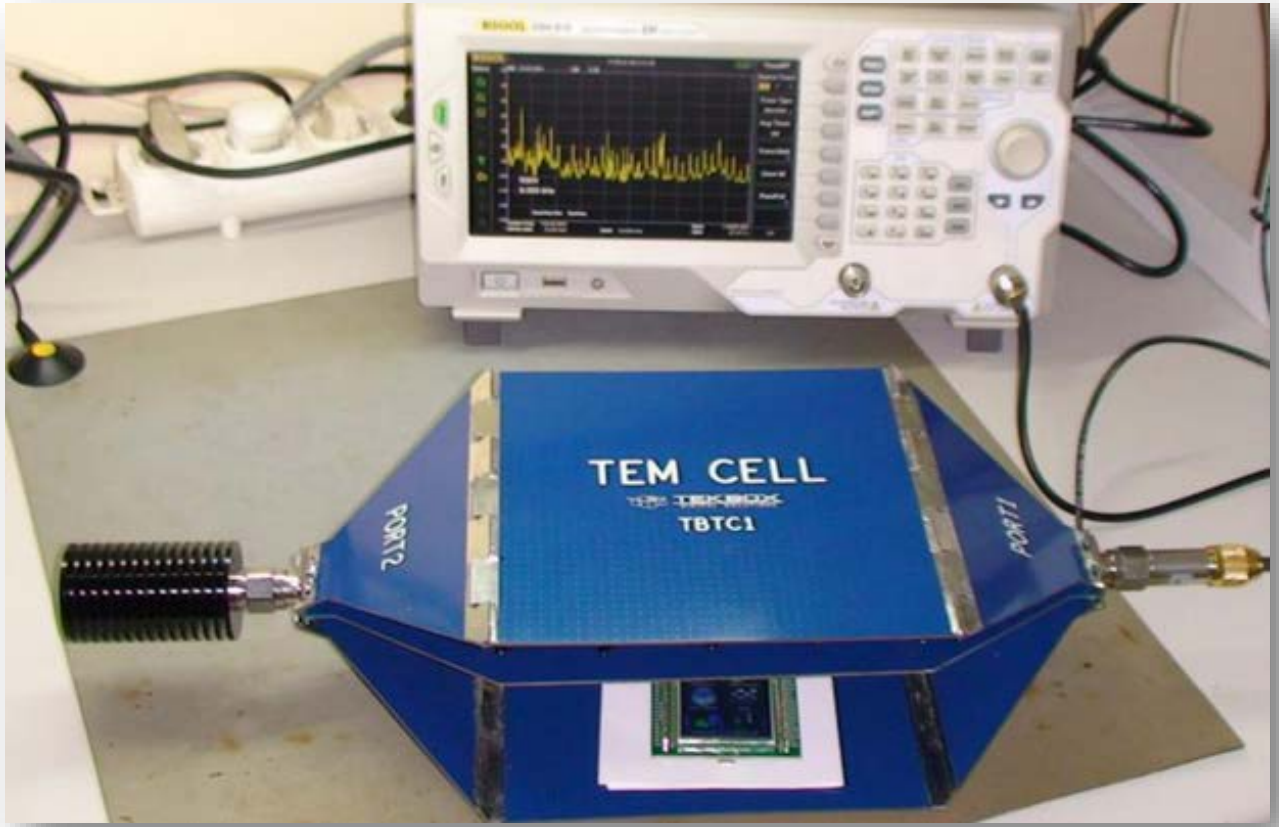
EMC



Fontys Engineering

Verhuizing technologie opleidingen Eindhoven naar TU/e campus

Waarom op deze superlocatie studeren?

Nieuws RONDOM de nieuwe locatie

2020 new shack to FHICT in new building

Photo May 28th, 2019 @ 3PM

THINK BIGGER

Special thanks

- Ezra – Sound Engineering
- Arno – Salve Mundi
- ESRAC students

SALVE MUNDI

THINK IGGER

Special thanks

Maxwell Foundation, MORSE Team:

- PA0DLO (Nico), PA0IB (Steef), PA3DSC (Martin), PE1KEH (Bertus), PE2HD (Harry), Walter, NL1183 (Theo).

KIVI

- And of course KIVI Telecom!

Questions