

New Course (5 ECTS)

Tractor-Implement Communication Technology

Tractors and implements need to be connected not only mechanically and powered, but also they need to be connected electronically; in order to communicate with each other. ISO 11783 is the current standard series, accepted worldwide for this purpose. The standard is also known as ISOBUS with its market name. In this course, we go through ISOBUS technology in details; starting from pins, bits and bytes and go all the way to messaging, signals, protocol stack and functions of tractor-implement system. In the module, you learn about CAN bus technology, history of ISOBUS, bus addressing, virtual terminal communication, task controller communication, CAN based GPS data transmission and other functionalities - hands on. The module contains lectures (2h per week) and closely connected exercises (2h per week). The module can only be completed as 5 ECTS; written exam in the end of the module. Success in exam requires active participation in the lectures and exercises.

Prerequisites:

- basic mathematics skills
- basic software development skills
- basics of electric circuits
- basics of agricultural machinery
- interests on engineering and Agrimechatronics

Learning goals:

- physical layer of communication networks
- bus arbitration and CAN bus
- programming communication protocol with ISOBUS devices
- design ISOBUS systems

Lecturer: Prof. Timo Oksanen

Assistant: Samuel Brodie

Course language: English

Module ID: WZ1407

Duration: Winter Semester 2020/2021 (WS)

ECTS-credits: 5

First lecture: 22/10/2021 at 12:00

Lectures (by default):

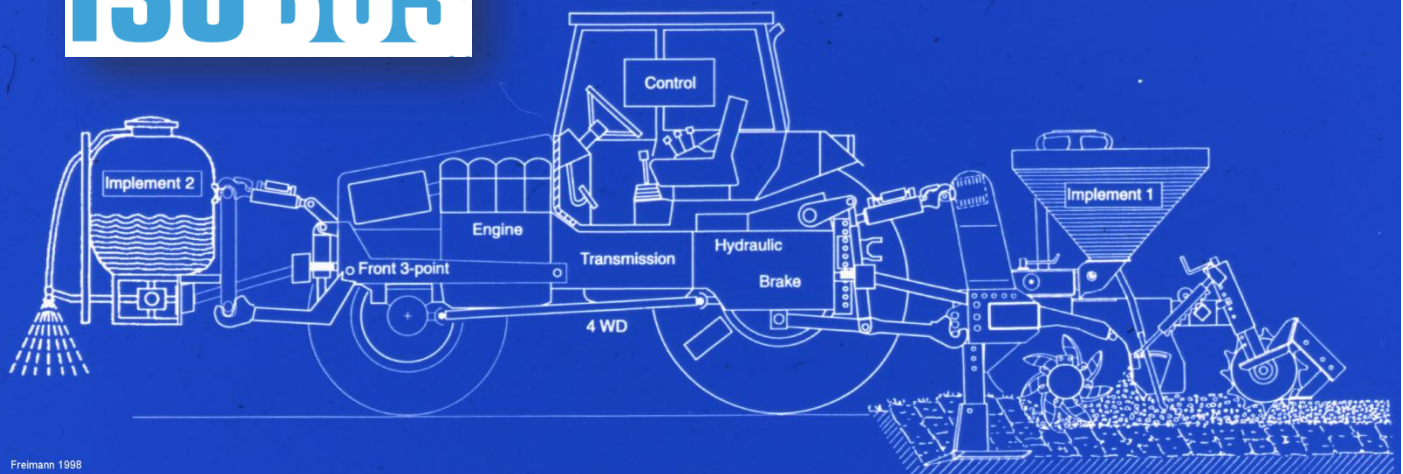
on Fridays 12:00-13:30

Exercises (by default):

on Wednesdays 10:15-11:45

Lecture room: Garching MW 1050, Johann-Bauschinger-Zeichensaal (5510.01.050)

AEF Certified



Calendar WS 2020/2021

#	Day	Date	Type	Topic
	Wednesday	20/10/2021	No Exercise	No Exercise
1	Friday	22/10/2021	Lecture	Communication basics and typologies
1	Wednesday	27/10/2021	Exercise	Engineering maths: hex numbers
2	Friday	29/10/2021	Lecture	CAN bus 1
2	Wednesday	03/11/2021	Exercise	CAN bus exercise
3	Friday	05/11/2021	Lecture	CAN bus 2
3	Wednesday	10/11/2021	Exercise	CAN bus exercise
4	Friday	12/11/2021	Lecture	SAE J1939
4	Wednesday	17/11/2021	Exercise	J1939 exercise
5	Friday	19/11/2021	Lecture	SAE J1939
5	Wednesday	24/11/2021	Exercise	J1939 exercise
6	Friday	26/11/2021	Lecture	ISO 11783 basics
6	Wednesday	01/12/2021	Exercise	ISO 11783 exercise
7	Friday	03/12/2021	Lecture	ISO 11783 tractor
7	Wednesday	08/12/2021	Exercise	ISO 11783 exercise + Software install
8	Friday	10/12/2021	Lecture	ISO 11783 diagnostics
8	Wednesday	15/12/2021	Exercise	ISO 11783 exercise
9	Friday	17/12/2021	Lecture	ISO 11783 Virtual terminal
9	Wednesday	22/12/2021	Exercise	ISO 11783 exercise
Winter Break				
10	Friday	07/01/2022	Lecture	ISO 11783 Virtual terminal
10	Wednesday	12/01/2022	Exercise	ISO 11783 exercise
11	Friday	14/01/2022	Lecture	ISO 11783 Task Controller
11	Wednesday	19/01/2022	Exercise	VT exercise
12	Friday	21/01/2022	Lecture	ISO 11783 Task Controller
12	Wednesday	26/01/2022	Exercise	VT exercise
13	Friday	28/01/2022	Lecture	ISO 11783 Task Controller
13	Wednesday	02/02/2022	Exercise	Task Controller exercise
14	Friday	04/02/2022	Lecture	NMEA2000
14	Wednesday	09/02/2022	Exercise	NMEA2000 exercise
15	Friday	11/02/2022	Lecture	

<https://www.moodle.tum.de/course/view.php?id=71711>