

## Ergänzende Veranstaltung der School of Engineering

**Titel:** System Dynamics Simulation of  
Socio-Technological Transitions

**Kürzel:** EVA\_SimTec

Umfang in Credits	3 ECTS
Veranstalter	ZHAW Zurich University of Applied Sciences, School of Engineering Institute of Sustainable Development (INE), Winterthur, Switzerland
Leistungsnachweis/Bewertung	Oral assignment (group presentation of models and simulation results) / evaluation sheet (40%) Written assignment (group work report) / evaluation sheet (60%)
Startdatum	Workshop 1: date KW8, 09.00-17.30 hrs (Kick-off) Workshop 2: date KW9, 09.00-17.30 hrs Workshop 3: date KW14/15, 09.00-17.30 hrs Workshop 4: date KW22, 09.00-17.30 hrs (Presentation Day)
Art der Durchführung	Four full-day workshops (teaching, in-class activities and group work progress meetings; total 30 hours) separated by independent self- study immersion and small group work periods (total 60 hours). In-class attendance is required and compulsory.
Unterrichtssprache	Teaching is generally in English. Student presentations and group work reports may be given/submitted in English or German.
Kurzbeschreibung (max. 300 Zeichen)	Technological (eco-) innovations are crucial for entrepreneurs to stay competitive and to satisfy societal needs in a sustainable manner, if they were used widely. Successful marketing of (eco-) technologies requires clear understanding of the impact of organizational and economic decision contexts. This EVA introduces and applies system dynamics modelling as a helpful tool for the analysis of the complex socio-economic interactions influencing the market success of (eco-) technologies supporting socio-technical transitions to sustainability. It includes designing and simulation of socio-technical system architectures, strategy and policy evaluation as well as sensitivity analyses. Graphical user interfaces (GUI) are introduced (or built) for scenario and strategy evaluation.
Modulinhalte und Lernziele	<b>Goals:</b> In this Module, the students will <ul style="list-style-type: none"> <li>gain competences in understanding the conceptual approach to system dynamics modelling of socio-technical system architectures</li> <li>develop and apply strategy, scenario experiments or sensitivity analysis for future oriented system analysis</li> <li>acquire insights into the barriers and drivers of technological (eco-) innovations and socio-technical transitions</li> </ul>

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	<ul style="list-style-type: none"> <li>• apply successfully tools and software (e.g. Vensim, Forio epicenter, Visual Basics for Applications)</li> </ul> <p><b>Contents:</b>  Workshop 1: Introduction into concepts of socio-technical transitions and System Dynamics Modelling based on successful small models and applications in case studies and flight simulators.  Workshop 2: Developing own simulation models or adjusting existing model structures (respecting the system dynamics modelling competence level of the students).  Workshop 3: Designing strategy, scenario experiments and sensitivity analysis, developing GUI.  Workshop 4: Presentation of small group works, debriefing.</p>
Zulassungsvoraussetzungen	Bachelor of Science (or equivalent), English language skills.
Literatur	Ulli-Beer, S. (ed., 2013). Dynamic Governance of Energy Technology Change: Socio-technical transitions towards sustainability. Series: Sustainability and Innovation. Springer-Verlag Heidelberg, 252p. Kubli, Merla; Ulli-Beer, Silvia (2016). Decentralisation dynamics in energy systems: A generic simulation of network effects. <i>Energy Research &amp; Social Science</i> , 13: 71-83. Sterman, J. Business Dynamics (2000), Irwin McGraw-Hill. Further literature and websites will be provided during the Module.
Besondere Regelungen	All Workshops are conducted at Technopark Winterthur. Weblink: <a href="https://www.zhaw.ch/storage/shared/hochschule/lageplaene/lageplan-winterthur-lagerplatz-stadt-mitte.pdf">https://www.zhaw.ch/storage/shared/hochschule/lageplaene/lageplan-winterthur-lagerplatz-stadt-mitte.pdf</a> (building LT or LN). The venue can easily be reached by public transport (10 min on foot from Winterthur railway station).
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