

<b>Module code</b> (1.)	<b>Module description</b> (2.)	<b>Category</b> (3.)
MBI 2940 Stand: 07.10.2021	History of Civil and Structural Engineering (HCSE)	Int. Master
	<b>Degree program</b> (4.)	Sustainable Engineering of Infrastructure
	<b>Faculty</b> (5.)	Civil Engineering and Conservation / Restoration

<b>Module supervisor</b> (6.)	Prof. Dr.-Ing. Ralf W. Arndt
<b>Type of module</b> (7.)	W (elective)
<b>Frequency</b> (8.)	Annually
<b>Standard semester of study</b> (9.)	2nd semester
<b>Credits (ECTS)</b> (10.)	2 ETCS
<b>Assessment</b> (11.)	<ul style="list-style-type: none"> <li>• Colloquium with an individual specialist presentation</li> <li>• Assessed on a pass/fail basis</li> </ul>
<b>Language of instruction</b> (12.)	English
<b>Admission requirements</b> (13.)	None
<b>Module is a requirement for</b> (14.)	-
<b>Module duration</b> (15.)	1 semester
<b>Mandatory registration</b> (16.)	Moodle
<b>Applicability of module</b> (17.)	Civil Engineering and others

Course (18.)	Lecturer (19.)	Type (20.)	No. of students (max.) (21.)	No. of courses per week (22.)	Contact hours per week (23.)	Workload		
						Face-to-face (24.)	Self-study (25.)	
1	HSCE	Prof. Dr. Arndt	Seminar	20	1	2	30	30
2								
Total						<b>2</b>	<b>30</b>	<b>30</b>
<b>Workload for the module</b> (26.)								<b>60</b>

<b>Learning objectives</b> (27.)	<ul style="list-style-type: none"> <li>• Understanding of the most significant historic developments in architecture and of structural engineering</li> <li>• Understanding of the interaction between form and structure in correlation to social and technical developments</li> <li>• Knowledge of the key phases, personalities and projects of structural and civil engineering</li> </ul>
<b>Course contents</b> (28.)	<ul style="list-style-type: none"> <li>• Examples of key structures from the ancient world to actual engineering structures</li> <li>• Interaction of architecture and structural design</li> <li>• Development of engineering sciences</li> <li>• The industrial revolution and the development of new building materials (iron, steel, concrete) and new forms</li> <li>• The paradigms of high and light structures</li> </ul>

	<ul style="list-style-type: none"> <li>• The second industrial revolution: the digitalization of the design and realization process</li> </ul>
<b>Preliminary exam requirements and assessment</b>	<ul style="list-style-type: none"> <li>• none</li> </ul>
<b>Literature</b>	<ul style="list-style-type: none"> <li>• ARNDT, RALF: Slide script (Moodle)</li> <li>• ADDIS, BILL: Building: 3000 Years of Design Engineering and Construction, Phaidon, 2007</li> <li>• BERGDOLL, BARRY: European Architecture 1750-1890, Oxford University Press, Oxford 2000</li> <li>• BENEVOLO LEONARDO: Geschichte der Architektur des 19. Und 20. Jahrhunderts, Band I und II, DTV, München 1988</li> <li>• BILLINGTON, DAVID P.: The Tower and the Bridge, Princeton University Press, 1985</li> <li>• BILLINGTON, DAVID P.: Der Turm und die Brücke, Wilhelm Ernst &amp; Sohn Verlag, Berlin, 2013</li> <li>• BÖGLE, ANNETTE; SCHMAL, PETER; FLAGGE, INGEBORG: leicht weit - Light Structures _ Jörg Schlaich, Rudolf Bergemann, Prestel, 2003</li> <li>• EISELE, JOHANN; KLOFT, ELLEN: High-Rise Manual, Birkhäuser, 2002</li> <li>• HALE, JONATHAN: Building ideas: an introduction to architectural theory. Wiley and Sons, London 2000</li> <li>• HEENE, GERD: Baustelle Pantheon, Planung Konstruktion Logistik, Verlag Bau+Technik, 2007</li> <li>• HUXTABLE, ADA LOUISE: The Tall Building Artistically Reconsidered: The Search for a Skyscraper Style, Pantheon Books, New York, 1982</li> <li>• JESBERG, PAULGERD: Die Geschichte der Ingenieurbaukunst, DVA Stuttgart 1996</li> <li>• KESSLER, ANDREAS: Vom Holzsteg zum Weltmonument, Verlag AG Buchdruckerei Schiers, 1996</li> <li>• LAMPRECHT, HEINZ-OTTO: Opus Caementitium, Bautechnik der Römer, Verlag Bau+Technik, 1996</li> <li>• MADRAZO, SANDRO: The Concept of Type in Architecture, ETH, Zürich 1995</li> <li>• MARK, ROBERT (Hrsg.): Vom Fundament zum Deckengewölbe – Großbauten und ihre Konstruktion von der Antike bis zur Renaissance, Birkhäuser Verlag, 1995</li> <li>• MISLIN, MIRON: Die Geschichte der Baukonstruktion und der Bautechnik, Werner Verlag</li> <li>• NERDINGER, WINFRIED: Frei Otto - Das Gesamtwerk: Leicht bauen, natürlich gesatltten, Birkhäuser, 2005</li> <li>• NERVI, PIER LUIGI (HG.): Weltgeschichte der Architektur (in 16 Bänden), Belser, Stuttgart 1978/79</li> <li>• PEVSNER, NIKOLAUS: A history of building types. Princeton University Press, Princeton 1976</li> <li>• PEVSNER, NIKOLAUS: Europäische Architektur von den Anfängen bis zur Gegenwart, Prestel, München 1957</li> </ul>

- PFAMMATTER, ULRICH: Architect and Engineer. The historical evolution of the two professions, In: Stefan Polónyi, Tragende Linien – Tragenden Flächen | Bearing Lines – Bearing Surfaces Form & Force VL2
- PICON, A.: L'art de l'ingénieur, Editions du Centre Pompidou / Le Moniteur, Paris 1997
- POSENER, JULIUS: Vorlesungen zur Geschichte der Neuen Architektur, Archplus 210 Sonderausgabe, Band I und II, Berlin 2013
- RICKEN, HERBERT: Der Bauingenieur – Geschichte eines Berufs, Verlag für Bauwesen, Berlin, 1994
- STRAUB, HANS: Die Geschichte der Bauingenieurkunst, Birkhäuser, 1949, 4. Auflage 1992