Activities of the
Institute for Technology and Management in Construction

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First Global Leadership Forum for Construction Engineering and Management Programs
March 20 - 22, 2011

1. Karlsruhe and the University

„Fan city“ Karlsruhe
First Global Leadership Forum for Construction Engineering and Management Programs
March 20 - 22, 2011

Faculties

<table>
<thead>
<tr>
<th>Faculties</th>
<th>INSTITUTES</th>
<th>STUDENTS</th>
</tr>
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<tbody>
<tr>
<td>Mathematics</td>
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<tr>
<td>Physics</td>
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<tr>
<td>Chemistry and Lifesciences</td>
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<td>1 232</td>
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<tr>
<td>Humanities and Social Sciences</td>
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<tr>
<td>Architecture</td>
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<tr>
<td>Civil Engineering, Geo- and Environmental Sciences</td>
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<tr>
<td>Mechanical Engineering</td>
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<td>Chemical and Process Engineering</td>
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<td>Electrical Engineering and Information Technology</td>
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<td>Computer Sciences</td>
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<td>Economics and Business Engineering</td>
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<td>Interfacultative Master Courses, „Studienkolleg“</td>
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<td>TOTAL</td>
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<td>18 515</td>
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</table>

Faculty of Civil Engineering, Geo- and Environmental Sciences

Civil Engineering

- Construction Engineering
- Water and Environment
- Urbanisation and Infrastructure Planning
- Construction Management
- Geotechnics

Including 23 Institutes
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2. The Institute for Technology and Management in Construction (Construction Management)

Staff

- **Director of Institute:**
  - Prof. Dr.-Ing. Fritz Gehbauer

- **Manager of Facility Management:**
  - Prof. Dr.-Ing. Dipl.-Wi.-Ing. Kunibert Lennerts

- **Manager of Decommissioning of Nuclear Facilities**
  - Prof. Dr.-Ing. Sascha Gentes
3. Teaching
3.1 Teaching for all students

(Bachelor of Science)

Teaching for all students

- Structural engineering and turnkey pre-fabricated buildings

formwork and scaffolding in building construction and civil engineering, materials preparation technologies, concrete batching and transport technologies
Teaching for all students

- Law and Contracts

3.2 Teaching for students specializing in Construction Management

(Master of Science)
### Structure of the TMB Master Programme at the KIT (over 2 years in 4 semesters)  

#### Part 1

<table>
<thead>
<tr>
<th>Module</th>
<th>Course</th>
<th>Credit Points</th>
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<tr>
<td>Construction Management and Work Planning</td>
<td>Work Planning</td>
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<tr>
<td>Construction Management and Work Planning</td>
<td>Site Operation Methods and Equipment in Construction</td>
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<tr>
<td>Mechanical Engineering</td>
<td>Basic Principles of Machine Technology</td>
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<td>Mechanical Engineering</td>
<td>Construction Machinery and Mechanical Process Engineering</td>
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<tr>
<td>Construction Management and Building Law</td>
<td>Site Management</td>
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<td>Safety in Construction</td>
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<td>Construction Management and Building Law</td>
<td>Law of Contract and Law of Site Management</td>
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<tr>
<td>Economics and Management in Construction</td>
<td>Cost Estimation</td>
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<td>Financing / Investment / Controlling</td>
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<td>Forms of Organisations</td>
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<td>Facility Management and Real Estate Management 1</td>
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**TOTAL CORE MODULES**  
30  30

### Part 4

<table>
<thead>
<tr>
<th>Module</th>
<th>Course</th>
<th>Credit Points</th>
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<tbody>
<tr>
<td>Technics of Construction Equipment</td>
<td>Mechanics and Technology of Construction Equipment</td>
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<tr>
<td>Technics of Construction Equipment</td>
<td>Seminar Construction Equipment</td>
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<tr>
<td>Aggregate and Concrete Production</td>
<td>Blasting Techniques</td>
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<tr>
<td>Aggregate and Concrete Production</td>
<td>Aggregate Production</td>
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<tr>
<td>Aggregate and Concrete Production</td>
<td>Production and Transport of Concrete</td>
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<tr>
<td>Dismantling of Nuclear Facilities</td>
<td>Disassembly and Decontamination of Nuclear Facilities</td>
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<tr>
<td>Dismantling of Nuclear Facilities</td>
<td>New Developments and Optimisations in Mechanical Engineering for “D and D”</td>
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<tr>
<td>Sustainability in Construction and Lifecycle Management</td>
<td>Lifecycle Management</td>
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<tr>
<td>Sustainability in Construction and Lifecycle Management</td>
<td>Sustainable Construction</td>
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<tr>
<td>Facility Management of Special types of Real Estate</td>
<td>Facility Management of non standard Real Estate</td>
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<tr>
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<td>Public Real Estate Management</td>
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<tr>
<td>Building Maintenance and Preservation</td>
<td>Conservation, Restoration and Reinforcement</td>
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<tr>
<td>Human Resources and Customer Relationship Management</td>
<td>Human Resources and Customer Relationship Management in the Sector of Real Estate</td>
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</tbody>
</table>

**TOTAL CORE ELECTIVE MODULES (at least 10 modules with 6 CP each selected)**  
60  60

**TOTAL MASTER CREDIT POINTS (CP)**  
120
4. Research in Technology

Automatic Control and Shock Stress Limitation for Vibratory Pile Driving
Decommissioning of nuclear facilities

Rescue and saving of buried people
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Computer integrated road construction

Adaption of construction vehicles to rescue applications
Postgraduate programme "Natural Disasters"

Technologies and Projects

- e.g. for decontamination
Technologies and Projects

- Further developments of AMANDA with practical application at the nuclear power station in Würgassen, Germany

AMANDA II

AMANDA III

e. g. separation of steel and reinforced concretes
Technologies and Projects

- ASTU
  - Automatisierte Seilsägetechnologie für Unterwasserdemontage (Automated Wire Cutting Technology for Underwater Disassembly)

  - Funded by BMBF
  - A joint project with Siempelkamp Nukleartechnik GmbH and Hilti Corporation

e.g. for the management of the entire decommissioning process
Technologies and Projects

- Lean Management – WAK
  - Introduction of lean management methods for the highly complex field of decommissioning nuclear facilities
  - Pilot project for the decommissioning of the reprocessing facility’s vitrification plant in Karlsruhe, Germany
  - Increased efficiency and added value for the entire procedural chain up to the release of a decontaminated site

Technologies and Projects

- KIT stand at Hannover Trade Fair 2009
  - Presentation of AMANDA I
  - Test rig of suction plates
Examples of Completed Projects

- Cutting off of brackets KWO – SNT
- Test rig at TMB

5. Research in Management
5.1 Lean Construction Management

(separate presentation)

5.2 Education and research in the area of Real Estate and Facility Management
Maintenance Budgeting – new approach

Calculation method PABI

- **P** Practical oriented
- **A** Adaptive
- **B** Budgeting
- **I** Maintenance measures ($I = \text{Instandhaltung}$)

\[
B_{IH} = \sum_{i=1}^{n} B_{IH_r,i} + \sum_{i=1}^{n} B_{IH_e,i}
\]

- $B_{IH}$ maintenance budget
- $r$ regular
- $e$ singular
- $n$ number of buildings