



**MASTER IRIV/IRMC**  
**MEDICAL ROBOTICS INTENSIVE COURSE**  
**STRASBOURG – February 2<sup>nd</sup> – February 10<sup>th</sup> 2015**  
**GENERAL SCHEDULE**

- **ARRIVAL: Sunday, February 1<sup>st</sup> 2015, Strasbourg – Entzheim – Airport and/or Train Station**

**Accommodations: Cité Universitaire Alfred Weiss, bâtiment A : 7 quai du Bruckhoff, 67100 Strasbourg (03 88 34 99 00) , Tramway C & D line, Jean Jaurès stop.**

- **MONDAY, February 2<sup>nd</sup>: 1<sup>st</sup> Teaching Day**
  - at IRCAD from 8:30 AM to 12:00 AM (Hôpital Civil, next to Petite France, see access map) - Lunch at *RU*
  - at Télécom Physique Strasbourg from 2:00 PM to 6:00 PM – (Pole API, 300 Bld. S. Brant, Illkirch)
- **TUESDAY, February 3<sup>rd</sup>: 2<sup>nd</sup> Teaching Day**
  - at Télécom Physique Strasbourg from 8:30 AM to 6:00 PM - Lunch at *RU Illkirch*
- **WEDNESDAY, February 4<sup>th</sup>: 3<sup>rd</sup> Teaching Day**
  - at Télécom Physique Strasbourg from 8:30 AM to 6:00 PM - Lunch at *RU Illkirch*
- **THURSDAY, February 5<sup>th</sup>: 4<sup>th</sup> Teaching Day**
  - at Télécom Physique Strasbourg from 8:30 AM to 6:00 PM – Lunch at *RU Illkirch*
- **FRIDAY, February 6<sup>th</sup> : 5<sup>th</sup> Teaching Day**
  - at Télécom Physique Strasbourg from 8:30 AM to 6:00 PM – Lunch at *RU Illkirch*
- **MONDAY, February 9<sup>th</sup> : 6<sup>th</sup> Teaching Day**
  - at IRCAD from 9:00 AM to 1:00 PM – Lunch at *RU*
  - at Télécom Physique Strasbourg from 2:30 PM to 5:00 PM
- **TUESDAY, February 10<sup>th</sup> : 7<sup>th</sup> Teaching Day**
  - at Télécom Physique Strasbourg from 8:30 AM to 5:00 PM – Lunch at *RU Illkirch*
- **DEPARTURE OF TELECOM PARIS Students:**
  - **Tuesday, February 10<sup>th</sup> or Wednesday 11<sup>th</sup>, Strasbourg – Train Station or Entzheim - Airport**

**MEDICAL ROBOTICS INTENSIVE COURSE**  
**STRASBOURG – February 3<sup>nd</sup> – February 10<sup>th</sup> 2015**  
**TRAVEL INDICATION AND ACCESS TO THE DIFFERENT PLACES**

**Accommodations:** Cité Universitaire Alfred Weiss, bâtiment A : 7 quai du Bruckhoff, 67100 Strasbourg (03 88 34 99 00) , Tramway C & D line, *Jean Jaurès* stop.

**Access from the airport:** take the train shuttle to Strasbourg Gare centrale/Main Station

**From Strasbourg Gare centrale/Main Station:** take the C line towards *Neuhoff* and get off at *Jean-Jaurès* (see tramway map *tramway-map-2012.pdf*)

**IRCAD :** 1, Place de l'Hôpital, Hôpital Civil

Take the tramway to *Porte de l'Hôpital* on D line. From the tramway station, go across the *Hôpital Civil* ground to IRCAD main entrance (see *ircad-access-map.pdf*).

**Télécom Physique Strasbourg :** 300, Bd. S. Brant, Parc d'Innovation Illkirch

From the hotel, take the D line to *Etoile-Polygone*, then the A line to *Campus d'Illkirch*, then, walk to the Pôle API and Telecom Physics Engineering School (TPS) main entrance.

**Attached Maps:**

- Tramway: *tramway-map-2012.pdf*

- IRCAD: *ircad-acces-map.pdf*

**CONTACT :**

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<b>Strasbourg University TPS</b>	<p style="text-align: center;"><b>MEDICAL ROBOTICS</b></p> <p style="text-align: center;">COURSE DESCRIPTION</p>	<b>Year 2014-2015</b>
<b>February 2<sup>nd</sup> – February 10<sup>th</sup> 2015</b>	<p style="text-align: center;"><b>Pr. Michel de Mathelin</b> <a href="mailto:demathelin@unistra.fr">demathelin@unistra.fr</a></p>	<p style="text-align: center;"><b>50h</b></p>
<b>Teaching staff:</b> Olivier Kermorgan, Florent Nageotte, Adlane Habed, Stéphane Nicolau, Didier Mutter, Hyewon Seo, Michel de Mathelin		
<b>Prerequisite :</b> Basis of Geometry, Algebra, Control Theory, Digital Signal and Image Processing		
<b>Goal :</b> <ul style="list-style-type: none"> <li>• To provide necessary knowledge in order to start research projects in the area of medical robotics;</li> <li>• To give an exposure to the specific constraints of an operating room;</li> <li>• To present the robotics devices and systems (sensors, actuators, mechanical structures, control architectures, ...) used for computer aided surgery;</li> <li>• To become able to analyze medical procedure in order to provide adapted assistive technologies and systems.</li> </ul>		
<b>Detailed program:</b> <b>Fundamental of robotics :</b> <ul style="list-style-type: none"> <li>- Modeling and parametrization of articulated objects in 3D space</li> <li>- Forward and inverse kinematics</li> <li>- Differential kinematics and control</li> </ul> <b>Robot vision :</b> <ul style="list-style-type: none"> <li>- Vision models</li> <li>- 3D reconstruction</li> <li>- Calibration</li> </ul> <b>Medical robotics and computer aided surgery:</b> <ul style="list-style-type: none"> <li>- Medical robotis main characteristics</li> <li>- Operating room equipment</li> <li>- Basis of laparoscopic surgery and NOTES</li> <li>- Sensors, registration and visual servoing</li> <li>- Augmented reality</li> <li>- Geometric modelling</li> <li>- Virtual reality</li> <li>- Haptics and telemanipulation</li> </ul>		
<b>Practical work :</b> <ul style="list-style-type: none"> <li>• Kinematic control of robot in Cartesian space and image based visual servoing</li> <li>• Experimental laboratory in the surgical suite of IRCAD</li> </ul>		
<b>Knowledge control modalities :</b> <ul style="list-style-type: none"> <li>• Homeworks;</li> <li>• Final examination: a three hours final examination at the end of the course.</li> </ul>		