

<b>27. EXTRACORPOREAL BLOOD PURIFICATION<sup>1</sup></b>	
Level I	
Department of Health Sciences (DSS)	
<b>Course coordinator</b>	Gianluca Villa
<b>Executive Committee</b>	Gianluca Villa Alessandro Di Filippo Stefano Romagnoli
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<b>Practical-professional profile of the course and industry sector of reference</b>	<p>The course aims to provide the theoretical knowledge and practical skills essential for adequately managing extracorporeal blood purification therapies that may be necessary for treating critical patients.</p> <p>Specifically, the course aims to train all health care professionals who cooperate in managing the critical patient undergoing extracorporeal therapies, whether nephrology physicians or resuscitative anesthesiologists, nurses, perfusionists, biologists, or dialysis technicians.</p> <p>To this end, the training will be structured to integrate face-to-face teaching and practical activities. The theoretical lectures, conducted in e-learning mode, provide the main concepts regarding extracorporeal treatments to support organ function in intensive care. Particular attention is paid to the description of the basic principles underlying treatments to support renal function (dialysis, convection, absorption), the primary treatment modalities (e.g., CVVH, CVVHD, CVVHDF, etc.), and the rational use of the main hemodiafilters and cartridges currently available on the market. Similarly, extracorporeal treatments to support the liver (single pass albumin dialysis (SPAD), mars, Prometheus, bioartificial organs) and lung function (both for decapneization and oxygenation) are described. This theoretical description is complemented by blood purification treatments designed to eliminate mediators of inflammation and bacterial toxins in the septic patient and, more generally, immunomodulation treatments of the critical patient under conditions of "cytokine cascade." The main technical and usage characteristics of adsorbent cartridges frequently used during clinical practice, such as, for example, "polymyxin b-based" ones, as well as of hemodiafilters specifically designed for cytokine removal (such as "high cut-off membranes") are described. The lectures enrich all topics with practical laboratory simulations and example experiments demonstrating the purifying effectiveness of individual methods. The ability to simulate different treatments in the laboratory allows individual learners to observe and manage in practical terms different treatment scenarios, including critical ones, independently and safely. Small sets of in-vitro experimentation and illustration of the theoretical and practical basis of in-vitro/ex-vivo/in-vivo experimentation concerning blood purification methods are also offered in the laboratory</p> <p>At the end of the course, learners will have acquired the knowledge necessary for the proper management of the critical patient undergoing extracorporeal treatment and, in particular, will be able to choose the timing of treatment initiation, the devices to be used with the specific machines, anticoagulation regimens, and how to clinically monitor the patient during and at the end of treatment. Thus, the practical skills necessary for extracorporeal circuit assembly and priming, attachment, treatment, blood return, and patient disconnection will be achieved.</p>

<b>Access prerequisites</b>	<p>Bachelor's Degree obtained under the system as per Ministerial Decree No. 270/2004 (or Ministerial Decree No. 509/1999, declared equivalent with D.I. July 9, 2009) in the following class:</p> <ul style="list-style-type: none"> <li>- L/SNT1 Class of degrees in nursing and midwifery health professions or equivalent degrees under Law No. 1/2002, provided they are combined with a high school diploma;</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>- Bachelor's Degree obtained under the system as per Ministerial Decree No. 270/2004 (or Ministerial Decree No. 509/1999, declared equivalent pursuant to D.I. July 9, 2009) in Cardiovascular Physiopathology and Cardiovascular Perfusion Techniques-L/SNT3 Class of degrees in technical health professions or equivalent degrees pursuant to Law No. 1/2002, provided they are combined with a high school diploma</li> </ul> <p>Master's Degree obtained under the system as per Ministerial Decree No. 270/2004 (or specialist Degree under Ministerial Decree No. 509/1999 declared equivalent under D.I. July 9, 2009) in the class LM-41 Medicine and Surgery;</p> <p>Degree awarded according to a system prior to Ministerial Decree No. 509/1999 in: Medicine and surgery</p>
<b>How the admission procedure takes place</b>	<p>Selection by academic qualifications and selective test, aimed at testing skills and interests in blood purification therapies in the critical patient. The test will consist of an online interview via a university teleconferencing platform. Criteria considered by the Coordinating Committee at the time of selection will include:</p> <ul style="list-style-type: none"> <li>Previous scientific experience gained in blood purification therapies, especially regarding participation in trials, observational studies, or clinical registries on the specific topic.</li> <li>Previous clinical experience gained in the field of blood purification therapies.</li> <li>Organizational/managerial aptitude for local dissemination (in one's hospital or clinical center of affiliation) of the knowledge acquired during the master's program.</li> </ul>
<b>Duration</b>	12 months
<b>Teaching methods</b>	<p>Mixed teaching mode consisting of:</p> <ol style="list-style-type: none"> <li>1) theoretical lectures delivered entirely in e-learning mode, making use of the University's Moodle platform,</li> <li>2) hands-on teaching activities conducted in the Laboratory of the Institute of Anesthesiology.</li> </ol>
<b>Language of instruction</b>	Italian
<b>Attendance requirements</b>	90%
<b>Location of the course</b>	<p>The practical simulations are held in person at the Laboratory of the Institute of Anesthesiology, CUBO 2 (2nd floor - room no. 2/038) Viale Pieraccini, 6 - 50139 Florence - and the Simulation Center of the Institute of Anesthesiology, Nuovo Ingresso Careggi (N.I.C.), Largo Brambilla, 3 - 50139 Florence.</p>
<b>Foreseen lecture schedule</b>	<p>The practical simulations will be held bimonthly and will take place during working days. The assessment of educational activities consists of examinations with a grade expressed in thirtieths and possible mention of honors or with a pass/fail grade in some cases.</p>
<b>Examinations procedures</b>	The assessment of educational activities consists of written tests on Moodle

<b>and schedule</b>	with a grade expressed in thirtieths to be taken during the academic year on dates chosen by the student.
<b>Final examination</b>	The final examination consists of the presentation of a paper.

<b>Available places and enrolment fees</b>	
<b>Full-fee students</b>	
<b>Minimum number</b>	5
<b>Maximum Number</b>	30
<b>Enrolment fee</b>	€2,000
<b>Single Modules</b>	
None planned	

<b>Description of the activities and training objectives of the internship</b>	<p>Hands-on simulation on extracorporeal blood purification machines using sterile solutions. These simulations will take place, in small groups, at the Laboratory of the Institute of Anesthesiology, CUBE 2 (2nd floor - room no. 2/038) Viale Pieraccini, 6 - 50139 Florence - and the Simulation Center of the Institute of Anesthesiology.</p> <p>The ability to simulate different treatments in the laboratory allows individual learners to observe and manage in practical terms different treatment scenarios, including critical ones, independently and safely.</p> <p>Observational activity. 250 total hours of hands-on training activities.</p>
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<sup>i</sup> This document is a translation of the form A.1 relating to the characteristics of the course attached to the Decree of the Deputy number 873 (record 158006) of 25th of July 2022, drafted in Italian and issued on the Master | Didattica | Università degli Studi di Firenze | UniFI and which therefore constitutes the only official document. This English translation cannot be used for legal purposes and has the sole purpose of supplying information in English on the content of the public notice.