



**Program of the on-line course
'Applied Vacuum Technology'
under auspices of the NEVAC**

The course is designed specifically for Master students, PhD students and Postdocs. It covers fundamental knowledge on vacuum and practical information about operating vacuum equipment in the lab. You also have ample opportunity to discuss your own equipment with vacuum experts.

When: Online: May- June 2021
Hands-on: Fall 2021

Duration: 5 online sessions from 09.00 till 12.00 hours
1 hands-on practical workshop from 10.00 – 16.00 hrs

Location: University of Amsterdam, Science Park 904

Coordination: Dr. A. Dick van Langeveld,

Lecturers: Dick van Langeveld (DL), David Schijve (DS) & Gesa Welker (GW),

Registratiron: via <https://NEVAC.nl>

Online Day	Topic	Lecturer
(Tue)		
1 (May 11)	<p>Introduction & Fundamental Aspects Thermal Velocity of molecules Mean free path of Molecules Adsorption / Desorption Saturated) Vapor Pressure</p> <p>Flow of gases Turbulent Viscous Molecular Conductivities Exercise</p> <p>Homework: Apply to your system:</p> <ol style="list-style-type: none"> 1. During pumpdown from atmosphere, at what points in time are which parts of your system in what flow regime? 2. What are the conductivities at various crucial positions (flanges, tubes, pipes, etc.) for gas inlets and outlets? 	Gesa Welker
2 (May 18)	<p>Total Pressure Gauges Membrane gauges Heat Conductivity gauges Hot- & cold cathode ionisation gauges</p> <p>Residual Gas analysis Magnetic Deflection Spectrometer Quadrupole Mass Spectrometer Autoresonant Trap Mass Spectrometer <i>Exercise residual gas analysis</i></p> <p>Homework: Apply to your system:</p> <ol style="list-style-type: none"> 3. Identify all pressure gauges and controllers on your system and look up their specs. 4. Identify (if any) your RGA systems and look up all of their specs. 	Dick van Langeveld

<p>3 (May 25)</p>	<p>Pre-Vacuum pumps Rotary vane pump Membrane pump Scroll pump Roots pump Multistage Roots pump</p> <p>Homework: Apply to your system: 5. Identify and pre-vacuum- and (U)HV pumps on your system and their controllers. 6. Draw a block scheme of your system.</p>	<p>David Schijve</p>
<p>4 (Jun 8)</p>	<p>(Ultra) High Vacuum pumps Turbomolecular pump Sorption pump Cryopump Ti-sublimation pump Getter pump Sputter-ion pump</p> <p>Homework: Apply to your system: 7. Briefly discuss the necessity of every type of pump in your system. If you had to rebuild your system, would you use the same combination of pumps, chambers and flanges? Motivate your answer.</p>	<p>David Schijve</p>
<p>5 (Jun 15)</p>	<p>Connections & components Cleaning and working discipline</p>	<p>Dick van Langeveld</p>

<p>Hands-on session</p>	<p>Topic</p>	
<p>(Sep 15)</p>		
<p>6</p>	<p>Demonstration of equipment & components</p>	<p>Dick van Langeveld</p>
<p>7</p>	<p>Leak testing (Theory & Exper)</p>	<p>David Schijve</p>