



**PROGRAMS AND BIBLIOGRAPHY**

<b>Subject</b>	
<b>Code</b>	<b>Name</b>
QO721	Organic Chemistry III

<b>Vector</b>
OF:S-2 T:002 P:000 L:000 O:000 D:000 HS:002 SL:002 C:002 AV:N EX:S FM:75%

<b>Pre requirement</b>	<b>QO421</b>
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<b>Summary</b>
Differences between heteroaromatic and heterocyclic compounds. Main reactions involving five and six-membered heteroaromatics having one or two heteroatoms (N,O, S). Synthesis of five and six-membered heteroaromatics having one or two heteroatoms. Synthesis of fused heteroaromatics. Examples of synthesis of drugs having heterocyclic rings.

<b>Program</b>
<ol style="list-style-type: none"><li>1. General introduction;</li><li>2. The importance of the Carbon-Carbon bond formation in the construction of organic molecules.</li><li>3. Frontier molecular orbitals. Definition and importance of the Organic Chemistry. Molecular orbitals of butadienes, allylic systems and benzene. The use of frontier molecular orbitals in the chemical reactivity.</li><li>4. Heterocyclic compounds, introduction, non-aromatic heterocycles.</li><li>5. 5-Membered aromatic heterocycles: Furan, Pyrrol and Thiophene;</li><li>6. 6-Membered heterocyclic compounds: Pyridine, Amino-pyridines and pyridones;</li><li>7. Condensed aromatic heterocyclic compounds: benzofuran, indoles, carbazole, quinolines, isoquinolines, etc. Reactivity and synthesis;</li><li>8. 5- and 6-membered aromatic heterocyclic compounds having more than one heteroatom: oxazoles, imidazoles, pyrrazoles, pyrimidines, purines, etc;</li><li>9. Natural substances of medical and pharmaceutical relevance having heterocyclic systems. Examples of synthesis of drugs containing heterocyclic rings</li></ol>

<b>Bibliography</b>
<ol style="list-style-type: none"><li>1. J. A. Joule e K. Mills, "Heterocyclic Chemistry", 5th Edition, 2010, Wiley-Blackwell, ISBN: 978-1405133005.</li><li>2. TheophilEicher, Siegfried Hauptmann e Andreas Speicher, "The Chemistry of</li></ol>

- Heterocycles: Structures, Reactions, Synthesis, and Applications” Terceira edição, 2013, Wiley-VCH, ISBN: 978-3527327478.
3. Stefani, H. A. “Introdução à Química de Compostos Heterocíclicos”, Guanabara Koogan, RJ, 2009
  4. Clayden, J.; Greeves, N.; Warren, S.; Wothers, P. “Organic Chemistry”, Oxford University Press, 2001.
  5. Streitwieser, H.; Heathcock, C.; Kosower, E. M. “Introduction to Organic Chemistry”, 4th Ed.; McMillan Publis. Comp., NY, 1992.
  6. Smith, M. B. “Organic Synthesis”, 2<sup>nd</sup>. Ed., McGraw Hill Inc., NY 2002.
  7. G. Solomons, C. Fryhle, “Organic Chemistry”, 7th ed., John Wiley & Sons, Inc., 2000. (New editions could also be used)

*Others Organic Chemistry textbooks could be used, depending on the subject being studied.*

#### **Evaluation criteria**

For grading policy, see: Regimento Geral de Graduação, Seção I – Normas Gerais, Capítulo V – Da Avaliação do Aluno na Disciplina. Students are required to attend 75 % of the lectures. For further details, see: Regimento Geral de Graduação, capítulo VI, seção X, artigo 72.