**Tematica concursului pentru ocuparea postului**

**Conferențiar poziția 10.,**

**din Statul de funcții al Departamentului de Bioinginerie**

1. Bazele biologiei sistemelor
2. Modelarea *in silico* a căilor metabolice pe baza constrângerii
3. Reconstrucția căilor metabolice, baze de date, abordare de tip “top-down” și “bottom-up”
4. Modele metabolice la scară genomică și principalele aplicații
5. Modelarea și optimizarea fluxurilor metabolice - Flux Balance Analysis (FBA)
6. Caracteristicile rețelelor fără scară
7. Crearea tulpinilor prin optimizare pe două niveluri
8. Robustețea căilor metabolice, PhPP, MOMA
9. Clasificarea genelor, pFBA, FVA
10. Clasificarea și caracterizarea bioreactoarelor
11. Cinetica fermentației
12. Modele matematice al proceselor de fermentație
13. Principii generale de proiectare a bioreactoarelor

**Bibliografie**

1. Bernhard Ø Palsson: Systems Biology Constraint Based Reconstruction and Analysis, Cambridge University Press, UK, 2015.
2. Barabási Albert-László, A hálózatok tudománya, szimulációk és adatfeldolgozás Pósfai Márton, [Budapest]: Libri Kiadó, 2016.
3. Nelson, David L. - Cox, Michael M, Lehninger Principles of Biochemistry - eighth edition, W. H. Freeman and Company, 2021.
4. Ábrahám Beáta, Biokémia, Csíkszereda, Státus Kiadó, 2013.
5. Laurent Heirendt et al., Creation and analysis of biochemical constraint-based models: the COBRA Toolbox v3.0, Nature Protocols, volume 14, pages 639–702, 2019.
6. Jens Nielsen, Stefan Hohmann: Systems Biology, Wiley-VCH Verlag GmbH & Co, 2017.
7. Eberhard O. Voit, Systems Biology: A Very Short Introduction, Oxford University Press, 2020.
8. Ines Thiele, Bernhard Ø Palsson: A protocol for generating a high-quality genome-scale metabolic reconstruction, Nature Protocols, Vol. 5, No. 1, 2010.

# [Hal S. Alper](http://link.springer.com/search?facet-author=%22Hal+S.+Alper%22): Systems Metabolic Engineering - Methods and Protocols, Methods in Molecular Biology, Springer Science+Business Media, LLc, 2013.

# Szép Alexandru, A technológiai folyamat elemzése és szintézise: jegyzet: curs Analiza şi sinteza proceselor tehnologice, Iaşi : Cermi, 2013.

# Shijie Liu, Bioprocess engineering: kinetics, sustainability, and reactor design, Amsterdam, Oxford: Elsevier, 2020, 664/L 73.

# Gregory T. Benz, Agitator Design for Gas-Liquid Fermenters and Bioreactors, [New York]: Wiley, American Institute of Chemical Engineers, 2021.

# Sevella Béla: Biomérnöki műveletek és folyamatok, Műegyetemi kiadó, 2001.

# Sevella Béla: Biomérnöki műveletek és folyamatok, elektronikus jegyzet, BME Vegyészmérnöki és Biomérnöki Kar, Typotex Kiadó, 2011.

# Michael C. Flickinger: Encyclopedia of Industrial Biotechnology, Bioprocess, Bioseparation, And Cell Technology Volumes 1-7, A John Wiley & Sons, INC., 2010.