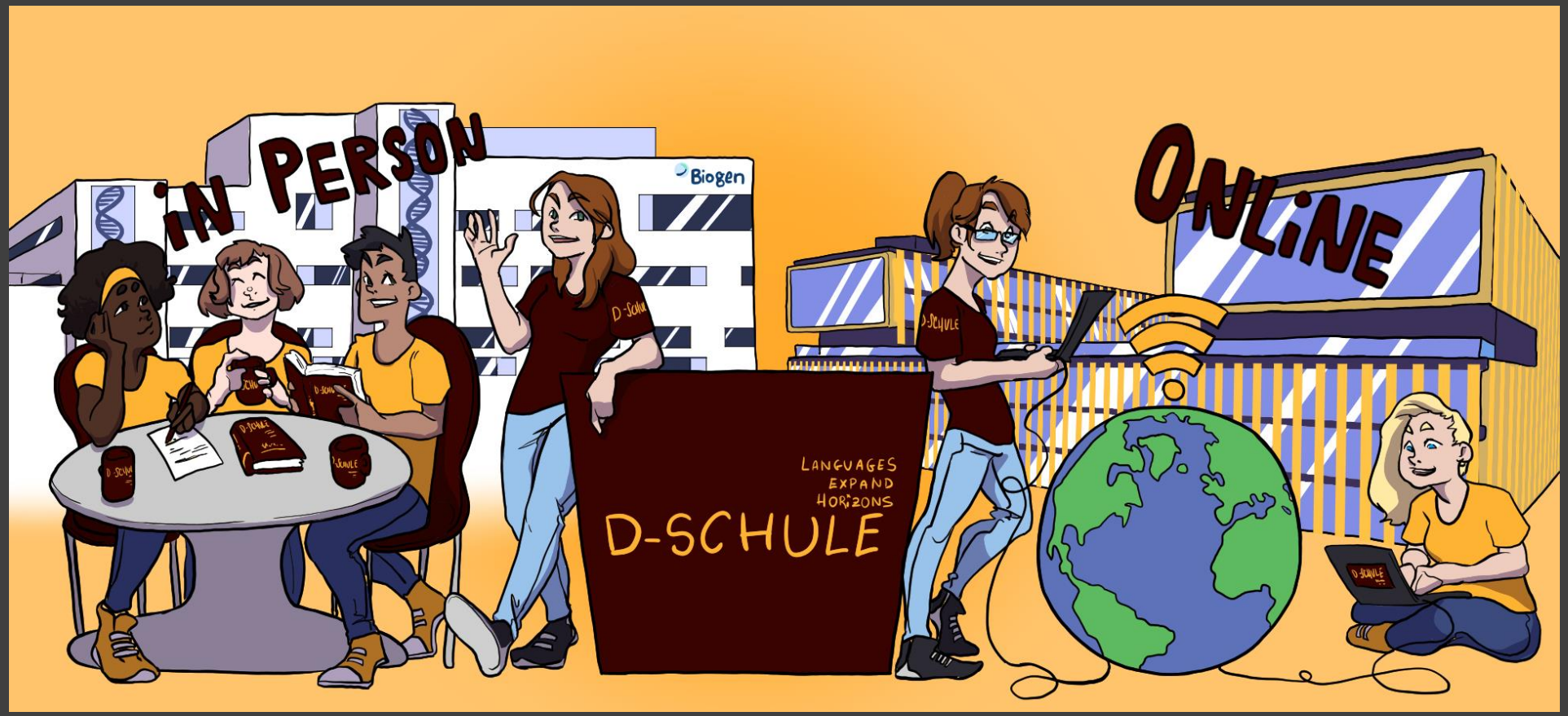
Biogen Specific Teaching Material

Basic Principles of Process Control Systems and Automation – Types of Analytical Methods, and Cell Counting



Questions & Answers

1. List some benefits (or drawbacks) of AT-line IPC analysis methods.

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1. Benefits of at-line IPC methods are cell counting, metabolite analysis, product quantification, product quality and contaminant determination.

2. Please list at least two (2) drawbacks of on-line and in-line analysis methods?

2. Two possible drawbacks of on-line and in-line analyses are instability over longer periods and possible interferences from other cell components.

3. Please list at least two (2) benefits of off-line analysis methods?

3. Two benefits of off-line analysis methods are ease of calibration, and person-to-person variation

4. Please list at least two (2) drawbacks of off-line analysis methods?

4. Two drawbacks are that off-line methods can be time consuming and labour intensive.

5. Which methods are used directly in the bioreactor where NO sampling is needed?

5. In-line and On-line methods are used directly in the bioreactor where NO sampling is needed.

6. Example of indirect analyses include which aspects?

6. Fluorescence spectroscopy, glucose measurements, oxygen and carbon dioxide measurements are examples of indirect methods of cell analysis.

7. Explain why cell-counting is necessary.

7. Some reasons for the necessity for cell counting are growth kinetics, health and count of the culture, and stability and reproducibility of culture, when to add inducers and when to harvest cells.

8. Which is generally easier to measure, cell counts in suspension cultures, or cell counts of immobilized cell cultures?

8. Cell counts in suspension cultures are generally easier to measure.

9. Automation and standardized techniques largely help to avoid variability and errors in cell counting. (true or false)

9. True

10. Cell dry weight; microscope counting; Vi-Cell®; turbidity / absorbance; dielectric, NIR, and MIR spectroscopy are all examples of direct – or indirect – methods?

10. Cell dry weight; microscope counting; Vi-Cell®; turbidity / absorbance; dielectric, NIR, and MIR spectroscopy are all examples of direct methods.

Thank you for your attention!

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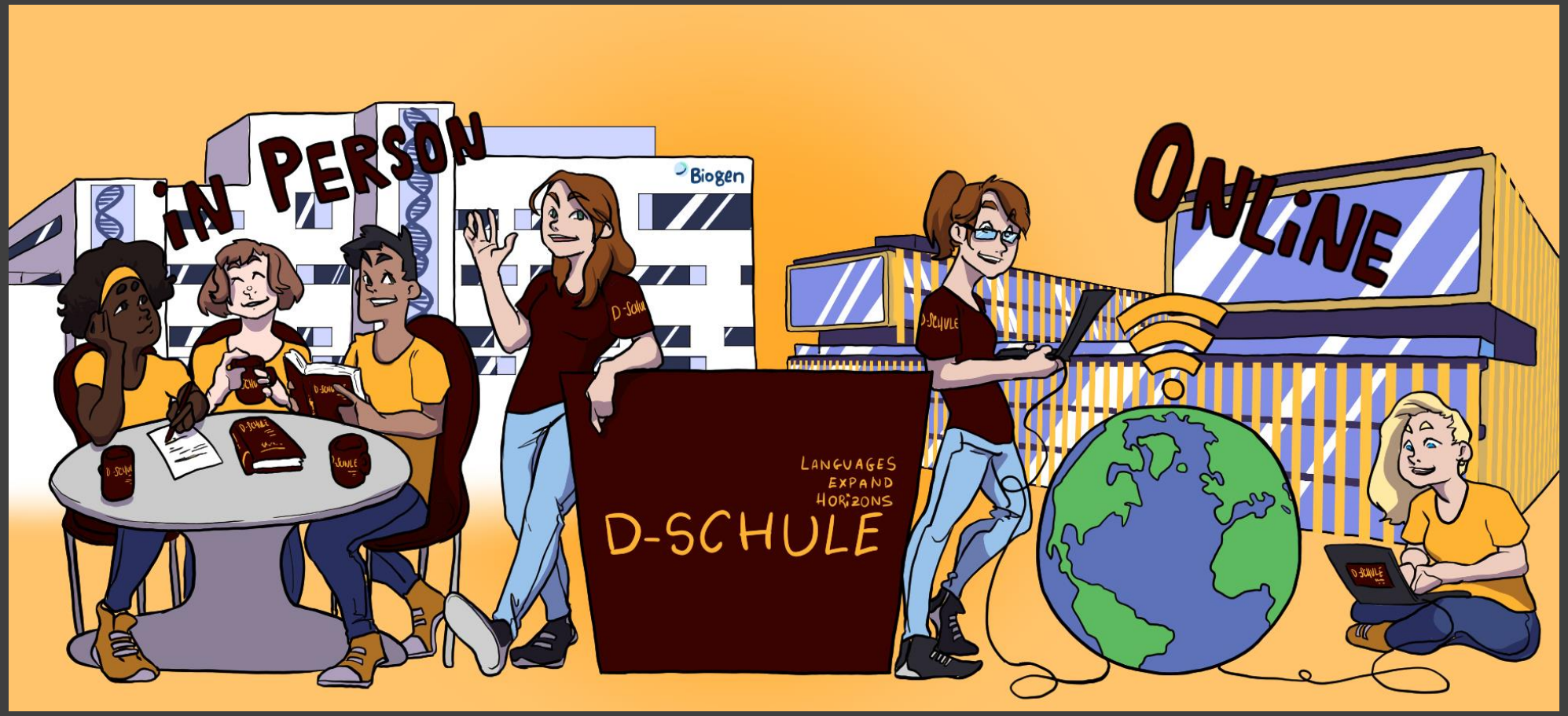

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