Next Generation Sequencing (NGS), basics

Introduction to NGS
https://www.illumina.com/science/technology/next-generation-sequencing.html

NGS Terminology
Illumina web page containing terminology definitions used in NGS
https://www.illumina.com/science/technology/next-generation-sequencing/beginners/glossary.html

NGS with a focus on Illumina technology in a single pdf document
https://www.illumina.com/content/dam/illumina-marketing/documents/products/illumina_sequencing_introduction.pdf

NGS, Illumina

Basic Steps
This video explains the four basic steps of the Illumina workflow: sample prep, cluster generation, sequencing, and data analysis.
https://www.youtube.com/watch?v=fCd6B5HRaZ8&ab_channel=Illumina

How to plan your first sequencing project
This webinar discusses the comprehensive workflow for planning your sequencing project including upfront considerations, library preparation, sequencing, and analysis.
https://www.youtube.com/watch?v=1ykx_AwtMJI&ab_channel=Illumina

Sequencing-by-Synthesis (SBS)
This webinar is a high-level overview of SBS technology for anyone new to the technology or just needs a refresher.
https://www.youtube.com/watch?v=oIJaA6h2bFM&ab_channel=Illumina

How Do I Achieve Consistent Quantitation?
This video uses a baseball analogy to compare three possible methods to quantify DNA: nanodrop, qubit/picogreen and bioanalyzer, and qPCR and discusses why qPCR is the gold standard.
https://www.youtube.com/watch?v=DuAEy9SoAtk

Metagenomics Sequencing
This webinar is an overview of the comprehensive workflow for a metagenomics sequencing project.
https://www.youtube.com/watch?v=K_xxZDmuim8&ab_channel=Illumina

RNA Sequencing
The purpose of the webinar is to understand the workflow for RNA sequencing from RNA isolation to data analysis.
https://www.youtube.com/watch?v=Qp6SjCO3Q1E

Sample Purification Bead Size Selection and Best Practices
https://support.illumina.com/content/dam/illumina-support/courses/TruSeq_DNA_SPB_Handling_and_Best_Practices/story_html5.html

Third Generation Sequencing, Oxford Nanopore Technologies (ONT)

ONT Flow Cell
The video covers the anatomy of the minION and gridION flow cell and its various components.
https://www.youtube.com/watch?v=zC6lAtzqi_k

Priming and Loading of Flow Cell
ONT video contains flow cell priming and sample loading demonstration.
https://www.youtube.com/watch?v=Pt-iaemrM88

ONT Resource Centre
Oxford Nanopore Technologies web page containing additional videos and publications for further study
https://nanoporetech.com/resource-centre

Third Generation Sequencing, Pacific Biosciences (PacBio)

Introduction to SMRT Sequencing
PacBio animated introduction to Single Molecule, Real-Time (SMRT) Sequencing.
https://youtu.be/NHCJ8PtYCFc

PacBio HiFi Long Read with high accuracy
This video explains how PacBio HiFi Long-Read sequencing delivers greater than 99.9% accuracy without PCR amplification
https://www.youtube.com/watch?v=7yYPHatccgw

PacBio Training Page
https://www.pacb.com/support/training/?fwp_paged=2&fwp_sort=preserve

Single Cell Sequencing

10x Genomics Chromium Single Cell Gene Expression Solution
https://www.youtube.com/watch?v=4NAS1qTJmYA

10x Genomics Support Page
https://www.10xgenomics.com/support

Illumina Single Cell Gene Expression Solution
https://sapac.illumina.com/products/by-type/sequencing-kits/library-prep-kits/single-cell-rna-prep.html#tabgroup-1-tab1

Flow Cytometry and Cell Sorting

The Basics of Flow Cytometry by Cytek Biosciences
https://www.youtube.com/watch?v=v8dzr_8hquk

How a Flow Cytometer Works by BioRad
https://www.bio-rad.com/en-us/feature/flow-cytometer.html

Fluorescence-Activated Cell Sorting (FACS) by BioRad
https://www.bio-rad.com/en-us/feature/fluorescence-activated-cell-sorting.html

Flow Cytometry Introduction and Basics Guide by BioRad
https://www.bio-rad-antibodies.com/introduction-to-flow-cytometry.html?_gl=1*16dhins*_ga*MTc2NDUzMTI0OC4xNzcyNTcwODQ5*_ga_C1CJDGB4L9*czE3NzQ0NzA5ODckbzMkZzEkdDE3NzQ0NzExOTEkajYwJGwwJGgw*_gcl_aw*R0NMLjE3NzI1NzA4NTAuRUFJYUlRb2JDaE1JaVlfei1zeUVrd01WNlVCX0FCMW1NZ3k1RUFBWUFTQUFFZ0xLcGZEX0J3RQ..*_gcl_au*MTg2NzkxMjk4OS4xNzcyNTcwODQ5

Introduction to Flow Cytometry
Several part course from Waters BioSciences going over the principles and basics concepts of flow cytometry and BD flow cytometers.
https://www.bdbiosciences.com/en-us/learn/training/basic/flow-cytometry-introduction

Self-Paced Training for the BD FACS Melody
A more thorough look into how the BD FACS Melody system available at the IGF functions and how to interpret/collect software data.
https://static.bdbiosciences.com/training/facsmelody-cell-sorter-overview/index.html?_ga=2.212102804.1844539368.1654535746-1180006478.1605230600#/

Flow Cytometry and FACS training resources
https://www.bdbiosciences.com/en-us/learn/training/basic/additional-basic-resources

Real Time PCR

What is Real Time PCR?
Bio-Rad provides basic overview of the Real Time PCR Technology. How it works, applications, RNA isolation, RT Quantification PCR, and Real Time PCR instrumentation.
https://www.bio-rad.com/en-us/applications-technologies/what-real-time-pcr-qpcr?ID=LUSO4W8UU

Essentials of Real Time PCR
ThermoFisher Scientific provides general overview of Real Time PCR.
https://www.thermofisher.com/us/en/home/life-science/pcr/real-time-pcr/real-time-pcr-learning-center.html

TaqMan vs SYBR Chemistry in Real Time PCR
ThermoFisher Scientific explains the advantages and disadvantages of TaqMan and SYBR Chemistry in Real Time PCR.
https://www.thermofisher.com/us/en/home/life-science/pcr/real-time-pcr/real-time-pcr-learning-center/real-time-pcr-basics/taqman-vs-sybr-chemistry-real-time-pcr.html

Real Time PCR Troubleshooting
Bio-Rad provides possible explanations for problems seen with qPCR data.
https://www.bio-rad.com/en-us/applications-technologies/real-time-pcrtroubleshooting?ID=LUSOBDHYP

Real Time PCR: Understanding Threshold Cycle (Ct)
ThermoFisher Scientific highlights the factors that must be considered when setting up and evaluating a Real Time PCR reaction.
https://www.thermofisher.com/us/en/home/life-science/pcr/real-time-pcr/real-time-pcr-learning-center/real-time-pcr-basics/real-time-pcr-understanding-ct.html

qPCR Basics
New England BioLabs provides the basics of qPCR in just 2 minutes video
https://www.youtube.com/watch?v=1kvy17ugI4w

CRISPR Gene Editing

CRISPR Explained
CRISPR-Cas9 editing explained by Mayo Clinic
https://www.youtube.com/watch?v=UKbrwPL3wXE

CRISPR: Gene Editing and Beyond
This animation by Nature explores some of the exciting possibilities of CRISPR.
https://www.youtube.com/watch?v=4YKFw2KZA5o

What genome editing and CRISPR-Cas9 are?
NIH webpage article explains genome editing, CRIPR-Cas9, and functions for use in research.
https://medlineplus.gov/genetics/understanding/genomicresearch/genomeediting/

Genome Editing with CRISPR-Cas9
MIT animation depicts the CRISPR-Cas9 method for genome editing - a powerful technology with many applications in biomedical research, including the potential to treat human genetic disease.
https://www.youtube.com/watch?v=2pp17E4E-O8

Questions and Answers about CRISPR
This Broad Institute web page contains a short video as well as questions and answers about CRISPR gene editing.
https://www.broadinstitute.org/what-broad/areas-focus/project-spotlight/questions-and-answers-about-crispr