MATH 150/155

For general introductions to the following topics, visit the indicated sites (Khan Academy, MIT Open Courseware, Youtube, NYU) . NOTE: the links sometimes branch out into further detailed subtopics and some links merge other topics as well.)

From KHAN ACADEMY: http://www.khanacademy.org/math/calculus/#math/calculus

For Math 150, available topics on the website above are (among others):

1. Introduction to Limits
2. Limit Examples
3. Epsilon-Delta Limit Definition
4. Derivatives
5. Chain Rule
6. Product Rule
7. Quotient Rule
8. Squeeze Theorem
9. Implicit Differentiation
10. L'Hopital's Rule
11. Maxima Minima Slope Intuition
12. Graphing Using Calculus/Derivatives
13. Optimization
14. Rate of Change
15. Mean Value Theorem
16. The Indefinite integral/Antiderivative
17. Indefinite Integration
18. Definite Integrals (Areas under a curve)
19. U-Substitution
20. Solid of Revolution

For **Math 155**, available topics on the website above are (among others):

1. Exponential Growth
2. Trig Implicit Differentiation
3. Trig Substitution
4. Polynomial Approximation of Functions
5. Integration by Parts
6. Sequences and Series
7. Divergence
8. Taylor and Maclauren Series
9. Surface Integral
10. Polar Coordinates and Parametric Equations, use
    http://www.khanacademy.org/math/precalculus/#math/precalculus

From MIT Open Courseware: Click on the links below to navigate to single variable calculus topics at MIT opencourseware:

For **Math 150**:

- limits and continuity, derivatives and differentiation rules
   http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-a-definition-and-basic-rules/

- implicit differentiation and derivatives of exponential and hyperbolic functions

http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-b-implicit-differentiation-and-inverse-functions/

- linear and quadratic approximation, curve sketching
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-a-approximation-and-curve-sketching/

- optimization, related rates and Newton's method
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-b-optimization-related-rates-and-newtons-method/

- mean value theorem, antidifferentiation and differential equations
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-c-mean-value-theorem-antiderivatives-and-differential-equations/

- definite integral and the first fundamental theorem of calculus
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-a-definition-of-the-definite-integral-and-first-fundamental-theorem/

- the second fundamental theorem of calculus, area and volume
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-b-second-fundamental-theorem-areas-volumes/

- L'Hospital's rule
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-a-lhospitals-rule-and-improper-integrals/

For **Math 155:**

- average value, probability and numerical integration
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-c-average-value-probability-and-numerical-integration/

- integrals involving powers of trig functions, trig substitutions and completing the square
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-a-trigonometric-powers-trigonometric-substitution-and-completing-the-square/

- partial fraction decomposition, integration by parts, arc length and surface area
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-b-partial-fractions-integration-by-parts-arc-length-and-surface-area/

- parametric equations and polar coordinates

http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-c-parametric-equations-and-polar-coordinates/

- L'Hospital's rule and improper integrals
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-a-lhospitals-rule-and-improper-integrals/

- Taylor series
http://ocw.mit.edu/courses/mathematics/18-01sc-single-variable-calculus-fall-2010/part-b-taylor-series/

Other recommended links:

The following link navigates to a series of older lectures on single variable calculus from MIT open courseware youtube channel:

http://www.youtube.com/playlist?list=PL3B08AE665AB9002A&feature=plcp

The following link navigates to video lectures on single variable calculus at NYU open courseware:

http://www.nyu.edu/academics/open-education/coursesnew/calculus-I.html