Advanced image processing (Lesson plan)

Class 1

Students reproduce the teacher's demonstration.
Whenever needed, exercises can be given to ensure all is well understood

Smart object (+ linked elements)

- Vector or raster content

- Layer content (or linked element) remain intact (unchanged)

- If the linked element is modified externally = changes may be applied in Photoshop
  (alert on opening document / Update document)

- Adjustments are stored in layers (like styles/effects)
  May be hidden, deleted BUT ALSO readjusted

Importing as smart object

- From FILE / IMPORT AS SMART OBJECT menu
- Drag and drop from another application (e.g. browser)

- Import PDF as smart object

Content replacement

- From FILE / SMART OBJECTS / REPLACE CONTENT

Exporting content

- From FILE / SMART OBJECTS / EXPORT CONTENT

Converting a layer to smart object

- From LAYERS menu
- Right-click on layer

Rasterize a smart object layer

- From LAYERS / SMART OBJECTS / RASTERIZE
- From FILE / LAYERS / SMART OBJECTS / RATERIZE
- Right-click on layer + Rasterize

EXERCISE : SMART OBJECT

Quick mask

- Mode allowing to make selection using paint/drawing tools

- Options (double-click icon on tool-bar) :
  - Select area painted
  - Exclude area painted

Making a selection with Quick mask

- Enter Quick mask mode
- Use drawing/painting tools to cover desired area
  Gradients produces different levels of transparency
- TO COVER = Use black with/without transparency
  TO UNCOVER = Use white with/without transparency

- Back to edit mode = selection done

- Going back to Quick mask mode allows you to modify the selection

- If selection made in edit mode = it is filled in Quick mask mode

Creating a mask from a selection

- From any selection (usual or made with Quick mask)

- Make selection + click the mask icon (layers panel)

- This create an alpha channel (transparency extra channel)

EXERCISE : QUICK MASK

Clipping mask

- Using a layer content to reveal part of another layer's content

Creating a clipping mask

- Create a shape in a layer (it will be used to show content of another layer)
- ON TOP OF PRECEDING LAYER = layer to be masked
- Right-click layer to be masked + select clipping mask
  OR ALT+CLICK in-between the two layers

EXERCISE : CLIPPING MASK

Working with masks

- Content is not erased BUT hidden (can be shown again)

- White mask reveals (Click on icon)
- Black mask hides (ALT+Click on icon)

- You need to select the layer's mask thumbnail preview to modify mask

Using a vector masks

- LAYERS / VECTOR MASK / Reveal or Hide
- Use a vector tool (e.g. path/pen/form) to reveal/hide layer's content
- Double-click mask thumbnail to access properties/options
- Path can be modified at any time

Using layer masks

- LAYERS / LAYER MASK / Reveal or Hide
  OR click the mask icon in the layers panel

- Paint (black/white) in the mask to show or hide layer's content
  CAREFUL not to paint on the layer itself

- Select mask layer preview thumbnail + CMD+I to invert (black to white / white to black)

- When a mask is created = an Alpha channel is also created

- Double-click mask thumbnail to access properties/options (refine edges, etc.)

Managing masks

- SHFT+CLICK mask layer preview thumbnail preview to hide mask
- MOVING MASK : Drag and drop mask from one layer to another
- COPYING MASK : Drag and drop mask with ALT pressed from one layer to another

Adjustment layers

- To be used instead of plain adjustments
  BECAUSE they can be readjusted at any moments

- TO CREATE : Use Adjustment layer icon (layers panel)
  OR adjustment panel

- Adjustment made to everything visible under the adjustment layer

- Can be clipped = Property icon (also : right-click OR alt-click between layers)

- Are created along with a layer mask = adjustment can be masked or partially masked

Effects (Layer style)

- Transformation stored within a layer (like a smart object)

- Can be readjusted, hidden, copied/paste, deleted

To apply an effect

- Select a layer + Double-click it = Style window opens
  OR : Select layer + icon on the layer panel + desired effect

- Select one or more effects (checkbox)

- To access effect's options : click on the effect's name

- To hide effects = eye icon (like for layers)

- To modify effects = double-click effects

- Tocopy/paste = select layer + Copy layer style + paste on desired layer

Assignment 01

Close-cut a model from its background and integrate it in another decor.
(image maybe supplied by the teacher or students may find their own elements on Internet)

Class 2

Presentation : assignment 01

Compositing using color range selection

Color range

- Predefined color list allows you to select :
  We'll be using : lightens, mid-tones, darkens

- You then can divide these tones on separate layers (different effects possible)

Compositing with darkens

- Create a white background layer

- Place an image on a second layer over the background

- Select the image layer + color range (darkens) + copy + paste
  (The darkens will have been copied in place on a new layer)

- If you hide the image layer, you will see the darkens over the white background

- Try different blending modes (+ transparency) over the image

Compositing with lightens

- In the same document : hide the darkens layer

- Select the image layer

- Use color range to copy/paste the lightens

- Try different blending modes (+ transparency) over the image

- You can use multiply + gaussian blur to create soft highlights effects
  (then show darkens layer in product mode to bring out darker features)

- A mask can be use to apply the effect to specific areas

Noise reduction

FILTERS / NOISE / NOISE REDUCTION

- Explain what is noise

- White noise / color noise

- Noise reduction filter : simple mode + advanced
  - Intensity
  - Keep details

  - Color noise reduction
  - Keep details

  - JPEG artifacts (checkbox)

  - Advanced tab : Reduce noise in selected channels

Noise reduction using filters and compositing

- Because filters cannot always help correctly

- Duplicate the layer to correct

- Apply a surface blur filter until the noise has disappear
  FILTERS / BLUR / SURFACE BLUR

- Hide the layer using a mask

- Use a brush to apply the blurred layer over the original on specific areas
  (use transparency brush)

Sharpen an image

- FILTERS / SHARPEN / many choices depending on version : Intensity + Range

Sharpen using compositing

- Duplicate the layer to correct

- Apply a surface blur filter until the noise has disappear
  FILTERS / SHARPEN / select filter

- Hide the layer using a mask

- Use a brush to apply the blurred layer over the original on specific areas
  (use transparency brush)

Sharpen using high pass filter

- Duplicate the layer to correct

- Apply high pass
  FILTERS / OTHERS / HIGH PASS

- Adjust to reveal only the details you want to sharpen
  (will show on a 50% grey layer)

- Change the blending mode to Multiply + adjust transparency

Level adjustments using Lab mode

- In RGB, adjustments are made on the composite (3 color channels altogether)

- EXAMPLE : Levels or Sharpen are applied on the 3 color channels = Comb effects
  data are deleted

- In Lab mode = Levels can be applied on L channel (lightness)
  No effects on color channels = no loss

Procedure

- Change color mode from RGB to Lab
- Adjust Levels
- Flatten layers if needed
- Change color mode back to RGB = perfect histogram

- Also true for : Curves, Lightness/contrast, exposure, etc.

Sharpen adjustments using Lab mode

- What is true for Levels is also true for sharpen filter

- Sharpen is applied on composite = should be applied on Lightness channel only

Procedure

- Change color mode from RGB to Lab
- Apply shrpen filter selecting the L channel
- Flatten layers if needed
- Change color mode back to RGB

To apply sharpen efficiently

- Start with high values :
  Gain 500%, Radius 15, 0
- Adjust the Radius until fringes disappear
- Then adjust the Gain

Complexe selections using channels

Using windy hair image

- To use when the background contrasts with the hair (e.g. white background/black hair)

Procedure

- Make normal selection of the simple part of the model
- Save selection (SELECT menu) = this creates an alpha channel
- THEN inspect the channels to find the more contrasted channel + duplicate it and name it (e.g. hair)
- Using Levels, make of this alpha channel a pure black and white :
  - Use Levels eye-dropper
  - Use burn tool on mid-tones to darken greys
  - Invert the channel
- Back to layers panel (Composite selected in channels)
  Load the two selections (adding one to the other) = SELECT / LOAD SELECTION
- Apply mask
- Select layer's thumbnail preview
- LAYERS / CACHE / COLOR DECONTAMINATION = adjust

Assignment 02

Select a model (remove the background image).
Integrate the model in a new environment (new background).
Adjust light, shadows, highlights and colors so it looks as natural as possible.

Class 3

Presentation : Assignment 02

Monochrome (and polychrome)

- Monochrome = image made of one color and white (transparency over background)
  (When black = black and white image)

- This color mode is not available from an RGB file
  The image must be in Grayscale

- Grayscale removes the color data (leaving the L channel data)
  Use a black and white adjustment first to have the nicest possible result)

- Change color mode from Grayscale to Monochrome (or Bichrome depending on version)

- Select a color

- Adjust associated curve

- Proceed the same way with Bichrome, Tri chrome, etc.

Texture mapping

- PSD file can be used to apply a texture to an image
  (Creates reliefs)

Procedure

  - Open the file you want to apply texture to
  - FILTERS / FILTERS GALLERY = choose Texture
  - Next to predefined textures, click the icon + select you texture PSD
  - Adjust options

Snapshots

- In History panel

- Creates a memory of a certain state of the document

- You can create many and continue modifying the image (camera icon of the panel)

- Select the snapshot checkbox desired + use the History form brush
  this brings back the selected snapshot's state of the image where applied

Image retouching

- Retouch tools already has been covered

- BUT retouch should not be made on the actual image

- INSTEAD create an empty layer and activate the option ALL VISIBLE LAYERS (retouch tool parameter bar)

- Retouches will then be placed on the top empty layer = allows you to correct

- Many retouch layers may be created for different parts of the image

- You may create <u>masters</u> at every important steps of the work
  (equivalent of copy merge) : CMD+ALT+SHFT+E

Image retouching using frequencies separation technique

- Images divided into two types of frequencies :

  - Hi frequencies (All the tiny details : lines, hair, dots...)
  - Low frequencies (Smooth area, color layers...)

- Original image already have Hi frequency data
  BUT lacks Low frequency data
  that will be used to replace the Hi frequency elements we want to eliminate (e.g. pimples)

Procedure

- Make two copies of the original layer
  (keep the original as safety layer so you can come back to it if necessary)

- Name the top layer HF (Hi frequency)
  the other one LF (Low frequency)

- Hide HF so you can work on LF

- Apply Gaussian blur to LF
  (until every default you want to get rid off becomes invisible)

- Show HF again and select this layer

- IMAGE / APPLY IMAGE :
  Result will be a gray image
    - Layer : LF
    - Blending : Substract
    - Opacity : 100% / Scale :2 / Offset 128
- Change HF blending mode to Linear light
  (Overall appearance will be back to normal)

- RUBBER STAMP (Active layer only option selected)
  Retouch HF layer

Image retouching in a single channel

- Problems sometimes present mainly in one channel (Especially for noise)

- You can retouch this channel only if wanted

Procedure

- Duplicate the original layer and name it Channel retouch

- Identify the channel to retouch

- Apply Gaussian blur so defaults become invisible

- Double-click on the layer (To show layer style panel)

- Layer style / Advanced blending
  = uncheck other channels (keep the one you want to work on) + OK

- Start retouching (All visible layers)

Skin smoothing

- In extreme retouching (e.g. magazine cover) = skin is entirely transformed

- Start with usual adjustments + major reparations AND basic skin retouch

Procedure

- After basic adjustments and retouch = May exclude areas with quick mask
  (e.g. hair, lips, eyebrows, etc.)
  EVEN BETTER we will use mask after instead

- Duplicate the original layer (or the master)

- Apply a filter for smoothing the skin (very much so it looks like plastic)
  (Gaussian blur, surface blur, average, etc.)

- Apply a black mask to this layer + Use brush with white (low transparency)
  Reveal smooth skin where needed (avoiding hairs, lips, etc.)

- When done : create a layer filled with 50% gray
  + change blending to Multiply

- Apply Add noise filter to the gray layer
  (Gaussian monochromatic) to recreate subtle skin texture

- Copy the smooth skin's layer mask to the noise layer
  (modify mask if needed + adjust using layer's transparency adjustment)

Assignment 03

Advanced retouching (image supplied by teacher)

- Basic adjustments + basic retouch

- Extreme skin retouching

- Image improvement so it look like a magazine cover photo

Class 4

Presentation : assignment 03

Body modification

Basic rules

- Modification should not show
  It should look natural

- To get a model taller :
  Always start with the lower legs, then thighs, waist...
  (Don't forget to make the arms longer as well)

- To make a model leaner :
  Start with arms, neck, part not covered by clothing

- To make a leaner waist :
  Bring hips towards the inside of the body, curve in the back, then modify the posterior roundness

- Face : less modifications possible

- Nose : often make it smaller

- Eyes : often make them bigger

- Mouth : often make it bigger + bring it up if nose as been made smaller
  (proportions must be respected)

EDIT / CONTENT AWARE SCALE

- Tool presentation + demonstration

Stretching body parts

- Select the part you want to stretch
  For lower legs : from under the knees down (including feet)

- Use EDIT / CONTENT AWARE SCALE + stretch

- THEN select from over the knees up (including the entire upper part of the model)
  + stretch up using Content aware scale

Modifying body position

- EDIT / PUPPET WARP : Tool presentation + demonstration

FILTERS / LIQUEFY (advanced mode)

(Tool presentation + demonstration)

- Tools + options panels :
    - Forward warp
    - Reconstruct
    - Smooth
    - Twirl
    - Pucker
    - Bloat
    - Push left
    - Freeze mask
    - Thaw mask
    - Face
    - Hand
    - Zoom

    - Option panels :
        - Size
        - Density
        - Pressure
        - Rate
        - Plus other more specifics

Assignment 04

Modify the model body and face features using Content aware scale, Puppet warp and Liquefy

Class 05

Presentation : assignment 04

Complete revision

Color match

- Allows for a layer to be color corrected based on another layer's overall tint
- Presentation and demonstration
- Not always good, but can be an excellent first step in color correction

Color lookup table

- IMAGE / ADJUSTMENT / COLOR LOOK UP
- Presentation and demonstration
- Predefined color grading
- Using, selecting, importing (can be created using other softwares)
  (Adobe Speedgrade, OpenColorIO, RedGiant LUT Buddy, Magic Bullet Look plugin...)

Render filters

(Presentation and demonstration)

Lighting effects

- FILTERS / RENDER / LIGHTING EFFECTS
- Omni + Spot light (Directional)

- Diferent light types options (intensity, ambiance, colors, etc.)

Lens flare

- Apply on image layer
- Compositing from a solid color layer

Flames

- Must be applied on a path
- Apply on image layer / Compositing from a solid color layer

Trees

- Must be applied on a path
- Apply on image layer / Compositing from a solid color layer

HDR (High Dynamic Range)

- Image made of multiple shots (various exposures)

- Data from multiple shots used to generate the final image
  (Shot using camera's bracketing option)

- Better light/dark render results
  (e.g. washed white window finally showing external elements)
  (e.g. washed out white sky finally showing clouds and blue sky)

- Also : different image effects (not always very nice)

- FILE / AUTOMATE / MERGE TO HDR EFEX PRO
  Demonstration of various adjustments and options

    - Importing the various shots
    - 8 / 16 / 32 bits
    - Contour glow (radius + intensity)
    - Tones and details
    - Lightens / Darkens / Vibrance / Saturation
    - Curves / Histogram equalization / Exposure _ gamma / Lightens compression

HDR Toning

- IMAGES / ADJUSTMENTS / HDR TONING

- Simulates HDR MERGING (when multiple shots not available)

- Approx the same options

Class 06

Intra exam

Class 07

3D rendering

- Photoshop allow you to create 3D renderings

- This isn't actual 3D models, but rendering using highlights and shadows

- For Real 3D, look for Blender (open source 3D engine)

3D Text extrusion

- Extrusion : giving thickness to a 2D element (adding z axis)

- Type a text using a color
  (black/white doesn't work well as light doesn't have major effects on it)

- TEXT / 3D EXTRUSION
  - 3D view is created
  - 3D panel appears
  - Layer moving tool is selected

- Ground : represented by a grid

- 3 axis shown on the element (x ,y, z)
  (If not showing, click the element)
  - x : Horizontal
  - y : Vertical
  - z : Depth

- 3 parts on these arrows :
  - Pointy end : Allows you to move the element on the selected axis
  - Arc : Allows you to rotate the element on the selected axis
  - Cube : Allows you to scale the element on the selected axis

- Adjustable light source tool on the canvas

- 3D panel / Environment (Double-click to show property panel)

- 3D panel / Scene (Double-click to show property panel)

- Background : material of different par of the element.

- Active view / default camera
  This allows you to rotate around the element without actually moving the element

- Light source

- 3D panel tabs :
  - Mesh mode
  - Deform mode
  - Cap mode
  - Coordinate mode

Extrude the layer content

- Draw something on a layer
  THEN : 3D / NEW 3D EXTRUSION FROM SELECTED LAYER

- Same options and possibilities than earlier

- 3D panel : Material / Diffuse
  Create new texture

- Adding a constraint (hole)
  3D / ADD CONSTRAINT FROM ACTIVE SELECTION

Assignment 05

Create a 3D piece of furniture

Class 08

Presentation : Assignment 05

Vanishing point

- FILTERS / VANISHING POINTS

- Allows to define 3D planes on images
  THEN draw/paste respecting the object's perspectives

- Interface and tools

- Creating perspective planes
  + CMD = Creation of a perpendicular plane extension

- Adjusting perspective planes

- Drawing/painting on planes

- Eye-dropper tool

- Copy/Paste on planes (Internal)

- Rubber stamp on planes

- Copy paste external elements in planes

- Free transform tool

- Methodology

Assignment 06

Create a 3D box using Vanishing point (Cereal box, software...)

Class 09

Presentation : Assignment 06

Video and animation

- Explain interpolation (movement decomposed into a sequence of still images)
  Start state, End state, interpolation

Frame animation

- Timeline panel /select frame animation + click
- Still image (Start state)
- Creating a new still image + move layer element (End state)
- Select both stills + Click Tween animation frame (and options in opening window)

- Image rate
- Play animation
- Loop/repeat option

- Adding new animated elements
- Tweening new animated elements

Exporting frame animation

- Saving document
- Exporting an animated gif
- Exporting a video render

Create a video timeline

- Timeline panel /Create a video timeline + click

- Video tracks :
  - Moving element on timeline
  - Stretching/shrinking elements on timeline
  - Adding layers/elements

- Animation types :
  - Position
  - Transparency
  - Style

- Key-frame principles :
    - Creating initial key-frame
    - Adding/deleting key-frames
    - Moving key-frames

- Animating position, transparency and style

- Importing images

- Importing video (+ Importation options)

- Video transitions

- Apply Photoshop filters = element must be smart objects

- Ease-in / ease-out = right-click on element

- Adding sound track

- Controlling sound

- Transforming timeline animation to frame animation (both ways)

- Saving document

- Export to anim gif

- Render video

Assignment 07

Create a video presentation (parameters defined by teacher)

Final assignment : create a matte painting

Explain what is matte paintings
Give examples.
Show tutorials / demonstration videos

1920 x 1080 RGB 8 bits

Class 10

Presentation : Assignment 07

Complete revision

Scripts

- Explain what are scripts

- Give examples

- How to create and manage actions

Batch processing

- FILE / AUTOMATE / BATCH PROCESSING
  Explain batch processing (linked to scripts)

Droplets

- FILE / AUTOMATE / CREATE DROPLET
  Same as batch processing, but create an icon on which to drop files to process

Contact sheet II

- FILE / AUTOMATE / CONTACT SHEET II
  Explain Contact sheet

Predefined scripts

- FILE / SCRIPTS
  Explain The following :

    - Image processor
    - Delete empty layers
    - Flatten all layer effects
    - Flatten all masks
    - Layer comps to files
    - Export layers to files
    - Statistics

File info

- Explain purpose and how to use it

Class 11

Final exam

Presentation : Final assignment