In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
from statsmodels.tsa.stattools import adfuller
```

In [2]:
```
file_path = r"C:\Users\HP\OneDrive\Desktop\NLP\Data\ML471_S1_Datafile_Practice.c

df = pd.read_csv(file_path)

# Convert Date column to datetime
df['Date'] = pd.to_datetime(df['Date'])

# Set Date as index
df.set_index('Date', inplace=True)

# Select Close price
close_series = df['Close']
```

In [3]:
```
adf_original = adfuller(close_series)

print("ADF Test on Original Close Price")
print(f"ADF Statistic : {adf_original[0]}")
print(f"P-value       : {adf_original[1]}")
print("-" * 40)
```

```
ADF Test on Original Close Price
ADF Statistic : -0.9169719313810458
P-value       : 0.7823319492318603
----------------------------------------
```

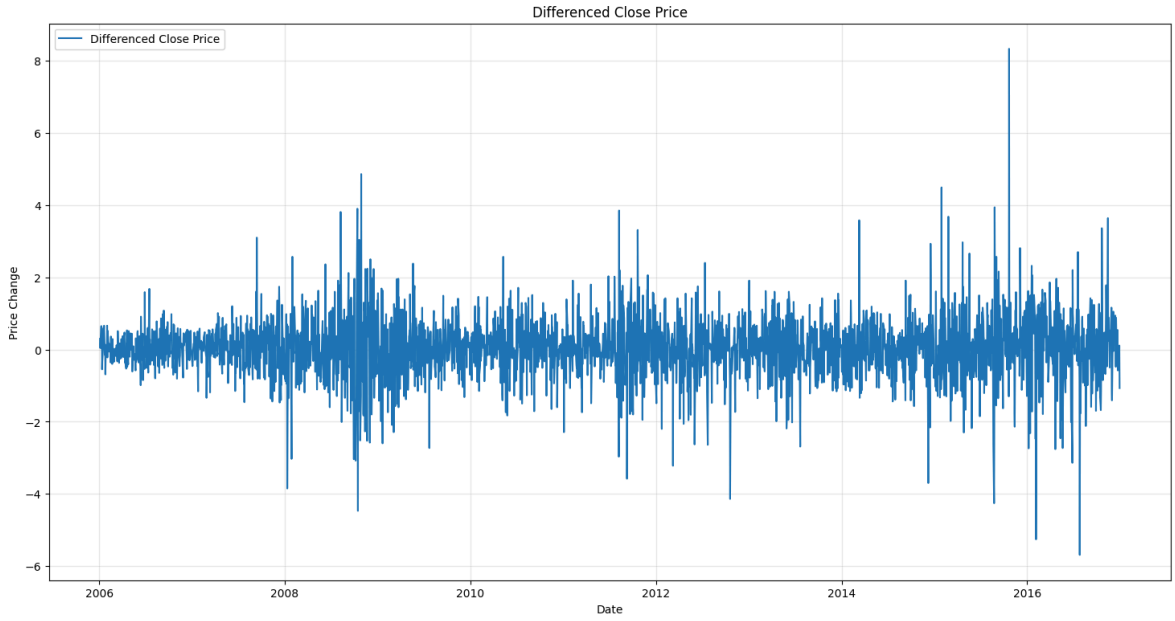
In [4]:
```
diff_close = close_series.diff().dropna()
```

In [5]:
```
adf_diff = adfuller(diff_close)

print("ADF Test on Differenced Close Price")
print(f"ADF Statistic : {adf_diff[0]}")
print(f"P-value       : {adf_diff[1]}")
print("-" * 40)
```

```
ADF Test on Differenced Close Price
ADF Statistic : -40.08896872157196
P-value       : 0.0
----------------------------------------
```

In [10]:
```
plt.figure(figsize=(18, 9))
plt.plot(diff_close, label="Differenced Close Price")
plt.title("Differenced Close Price")
plt.xlabel("Date")
plt.ylabel("Price Change")
plt.legend()
plt.grid(alpha=0.3)
plt.show()
```


Differenced Close Price
Differenced Close Price
Price Change
Date
8
6
4
2
0
−2
−4
−6
2006
2008
2010
2012
2014
2016